

Tracking Nurse Practitioner Outcomes:

A Quality Improvement Project

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Abstract

The purpose of this project was to develop and implement a Microsoft Access database to track nurse practitioner outcomes in the hospitalist program at a community hospital in the Southeastern United States as part of a quality improvement initiative. The literature describes the importance of ongoing quality improvement and the use of technology to track patient outcomes. Three patient outcomes were tracked for the hospitalist nurse practitioners by using chart reviews; and the data input into the database. These outcomes were length of stay, inpatient mortality, and 30-day readmission rate. The Nursing Role Effectiveness Model guided this project by relating the role, process, and structure of nurse practitioner care to patient outcomes. Data for the nurse practitioners was analyzed using t-tests assuming unequal variances comparing the aggregate nurse practitioner outcomes with national benchmarks. The results led to the acceptance of the null hypothesis that there is no significant difference between the groups at a 95% confidence interval. These results are consistent with the literature that nurse practitioners provide comparable care with other healthcare providers. While there is no statistical difference in the outcomes there remains clinical relevance for improvement. In the future these outcomes will be annually tracked and analyzed for quality improvement purposes.

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Background

Nurse practitioners are being employed in the hospital setting to provide high quality, cost-effective care to a broad range of acutely and chronically ill patients. According to Kleinpell (2003), tracking patient outcomes related to advanced practice nursing care is critical to offer value to the services provided, to allow for quality assurance, and to promote evidence-based practice. Since nurse practitioners are integrally involved in direct care delivery, they are well positioned to influence outcomes and directly influence quality improvement strategies (Price, Fitzgerald, & Kinsman, 2007). In 1999 the Institute of Medicine (IOM) issued a report entitled “To Err is Human” outlining the issues surrounding healthcare errors in hospitals and supporting the institution of quality improvement practices.

Quality improvement programs have been shown to improve patient outcomes and decrease the incidence of complications in the hospital setting (Chelluri, 2008). Quality improvement can be seen in the work done by Florence Nightingale, the founder of professional nursing, who during the 1850’s tracked and analyzed nursing interventions and the impact they had upon the patients’ outcomes. She was passionate about analyzing these outcomes related to nursing care because of her experiences during the Crimean war where she witnessed needless deaths of soldiers related to poor sanitary conditions (Rehmyer, 2008). Nightingale concluded that understanding and analyzing these poor outcomes was important to improving patient care (Chelluri, 2008).

The American Medical Association has recommended the use of outcome tracking to provide for quality assurance and to improve patient care. Methods to track patient outcomes, including the use of healthcare information technology and database development are being developed by various groups (Newcomb, et al. 2008). Newcomb and colleagues (2008) emphasized the importance of developing well-designed databases in order to track outcomes. They found that successful database utilization resulted in accurately tracking important information that allowed for performance and cost analysis, and implementation of evidence-based care. Knowledge of the clinical, informatics, and research components in the clinical area is critical to outcomes database development and utilization (Newcombe, 2008). Advanced practice nurses who have training in these areas, can therefore be important contributors to these efforts.

Healthcare has benefited from the implementation of information technology services in all clinical and educational realms. Jamal, McKenzie, and Clark (2009) performed a systematic review of the impact of health information technology on healthcare in the literature and concluded that health information technology had a positive impact on healthcare delivery. Healthcare information technology has resulted in better data management, decreased workload, and better compliance with evidence-based practice guidelines resulting in medical error prevention. Jamal, et. al (2009) went on to recommend the use of health information technology in the area of quality assurance. The conclusions supported by the evidence have guided this project to develop and implement an outcome database to track nurse practitioner related outcomes.

Conceptual model

The Nursing Role Effectiveness Model (NREM), a middle-range theory developed by Irvine, Sidani, and Hall (1998) was selected to guide this project because the role that advanced practice nurses have in patient care positively and directly affects patient outcomes. Irvine, Sidani, and Hall (1998) created the Nursing Role Effectiveness Model (NREM) as a way to relate nursing-sensitive patient outcomes as a means for quality improvement. Irvine et al. (1998) details that rising healthcare costs and patient outcomes are becoming key indicators for quality improvement processes and suggested that the NREM could provide direction to communicate the nursing related contributions for quality assurance purposes. The NREM specifically addresses the variables of structure, process and outcome related to how nursing care affects patient outcomes. The key concepts which were central to the project included: the organizational structure related to nurse practitioner care, the role components of nurse practitioner care, and patient outcomes related to nurse practitioner care (Sidani & Irvine, 1998).

Methods**Procedures**

The purpose of this project was to design and implement a patient outcome tracking tool as part of a quality improvement initiative at a community hospital in the Southeastern United States. A Microsoft Access database was developed in third normal form to track these outcomes. The use of third normal form prevents inconsistency and redundancy of data as well as ensures flexibility in the design of the database. The intention of this database development was to create a user-friendly database that could track hospitalist nurse practitioner outcomes.

The Society of Hospital Medicine (SHM) has delineated the top ten performance measures for hospitalist programs. Three of these metrics or outcomes were chosen for the nurse practitioners. These outcomes are related to quality care indicators and included: length of stay, inpatient mortality, and 30-day readmission rates. Analysis of this data will aid in the development of quality improvement educational initiatives for the hospitalist nurse practitioners.

The hospital department of Clinical Resource Management (CRM) assisted with outcome selection, chart reviews and data retrieval, and format design of the database. Health Information Systems assisted with determining which patients had hospitalist nurse practitioners involved in their care by providing a spreadsheet of data to the Clinical Resource Management department. This spreadsheet contained a list of all the patients for whom the nurse practitioners dictated either history and physicals or discharge summaries.

The Clinical Resource Management department personnel performed chart reviews for the nurse practitioners' patients to extract the data. De-identified information regarding the hospitalist nurse practitioners' patient outcomes was provided to the primary investigator. These de-identified outcome data were categorized by month and quarter for each provider in the hospitalist group. National benchmarking data were included to serve as reference points for the measured outcomes.

Analysis

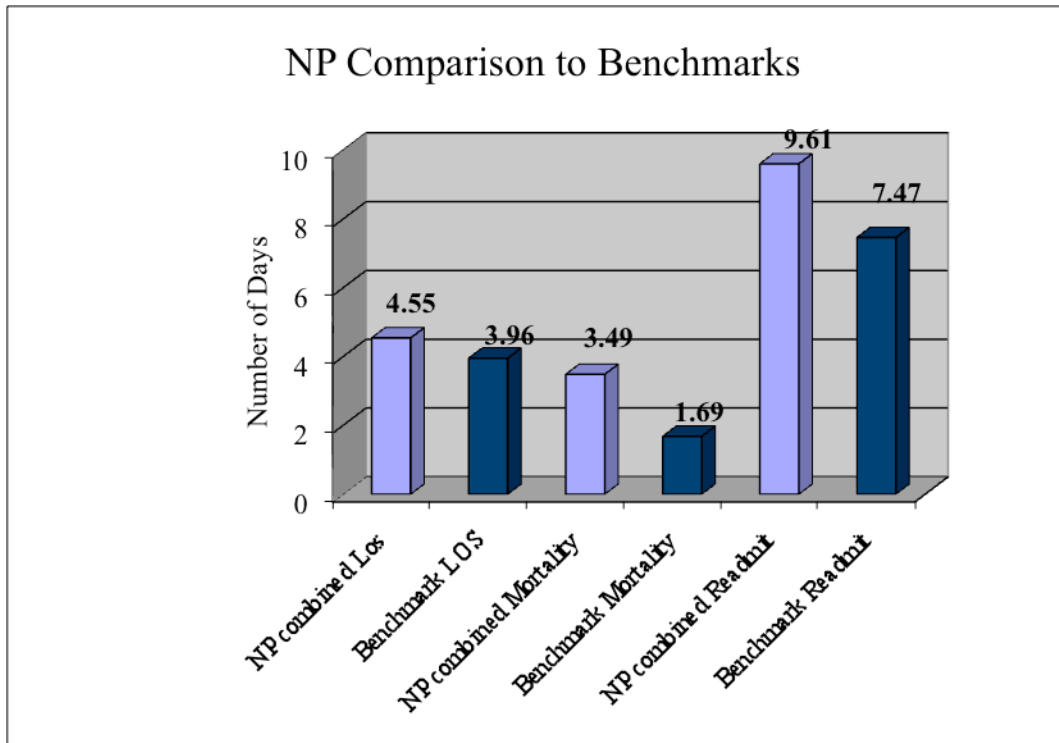
The Clinical Resource Management department collected data for the nurse practitioners for the final quarter of 2009 by performing 229 chart reviews. Aggregate outcome data was provided in a de-identified manner for data analysis. t-tests were

performed to compare the aggregate final quarter of 2009 outcome data for the nurse practitioners to the national benchmark data for the final quarter 2008 provided by Premier Healthcare Informatics. As the current year benchmark data was not available at the time of data analysis the previous years benchmark data was utilized during the same quarter to ensure an accurate reflection of the patient mix. Premier uses a database of over 2,300 hospitals to compare outcomes and create benchmarking averages.

Two-tailed t-tests assuming unequal variance were performed to compare the three outcomes for the hospitalist nurse practitioners to the benchmark outcomes. There was no mathematically significant difference between the groups at a 95% confidence interval with a calculated t-statistic of 2.64 for length of stay ($p=.11$), t-statistic of 1.47 for inpatient mortality ($p=.27$), and t-statistic of 1.66 for 30-day readmission rate ($p=.23$). The outcome data for the hospitalist group was compared to the nurse practitioner outcome data to ensure similar practice standards, but was not statistically analyzed.

Table 1 Comparison Outcome data

	NP outcomes	Benchmarks	T statistic	P Value
Length of Stay	4.55	3.96	2.64	.11
Inpatient Mortality Rate	3.49%	1.69%	1.47	.27
Readmission Rate	9.61%	7.47%	1.66	.23



Findings

While the nurse practitioners outcome data was not statistically different than the national benchmarks there remains room for clinical improvement. The average hospital stay at this facility costs an estimated \$7,000 per day (Clinical Resource Management, CVMC, NC 2010,) and a reduction in length of stay by only one day could potentially allow for significant cost savings. The high mortality rate, while not statistically significant is clinically significant. In the United States approximately 50% of people who die each year, do so in the hospital (capc.org, 2009); and with knowledge of this statistic, the hospitalist nurse practitioners regularly use hospice services to promote dignity and symptom management in end of life care for their patients. While the readmission rate is much higher than the national benchmark, it is not statistically significant; however, it is highly relevant clinically. Medicare and Medicaid are no longer reimbursing for readmissions within the 30-day time period after discharge. In the

face of this legislation, reimbursement is dramatically decreased causing increasing strain on the economic prosperity of the institution and hospitalist practice. Improvement in all of these areas is essential for cost savings, reimbursement, and the provision of high quality care.

The overall findings for each outcome were similar to the hospitalist group data indicating that the nurse practitioners have the same level of practice standards as the physicians in the group. These results are consistent with the literature that nurse practitioners provide comparable care with other healthcare providers. The national benchmark data was derived from the Premier Healthcare Informatics database of peer hospitals. This outcome data will be stored in the Microsoft Access database for future comparison. Repeat data extraction and analysis will be performed yearly during the final quarter annually to establish trends and provide for quality assurance purposes.

Discussion

Outcome tracking and analysis is important to ensure high quality, cost-effective care. The hospitalist care model is that once a patient has been admitted by a nurse practitioner, or picked up by a nurse practitioner they typically stay on the nurse practitioner service until discharged. These patients are jointly cared for by both a hospitalist physician and nurse practitioner. This care model allows patients for whom the nurse practitioners care to benefit from some of the differences in care rendered by nurse practitioners. A nurse practitioner's educational background includes a baccalaureate degree in nursing as well as graduate training in advanced practice nursing. This graduate training is focused on holistic care, health promotion, disease prevention and

maintenance. In order to continue the provision of high quality nurse practitioner care, tracking patient outcomes should continue on a regular basis.

Based upon the results of the data analysis, this database will be used to track outcomes annually for the hospitalist nurse practitioners. Currently, Premier Healthcare Informatics in Charlotte, North Carolina, tracks hospitalist outcome data; however, these outcomes are only specific to the physicians in the hospitalist group. Care provided by the nurse practitioners was not tracked previously and therefore not evaluated for quality assurance purposes. This essentially made the nurse practitioners “invisible” and also left the patients they cared for outside of the quality improvement analyses. This lack of outcomes tracking for the nurse practitioners was the stimulus for this database development and implementation project.

The small sample size limits the generalizability of this outcomes study. Shared billing practices also impacted the data analysis since the physicians in the hospitalist group were required to examine and document on each patient cared for by the nurse practitioners, which may have impacted the outcomes. Also, the hospitalist group data was analyzed twice as the nurse practitioner patients were also included in the physician analysis. The use of available benchmarking data from the previous year’s final quarter for data comparison also presents as a limitation, but these time constraints will be taken into consideration in future analysis.

Conclusion

As the use of information technology continues to expand in healthcare, nurse practitioners need to be aware of its value in their clinical practice. Development and implementation of an outcome tracking database can assist nurse practitioners in

promoting value for the services they provide by showing what impact they have on patient outcomes. Demonstrating a positive impact on patient outcomes allows nurse practitioners to no longer be invisible. Tracking outcome data for patients will also improve care by identifying areas of deviation from the standard of care and allowing for improvement on these areas as part of ongoing quality assurance.

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