JOURNAL CLUB

Alignment of Pain Reassessment Practices and National Comprehensive Cancer Network Guidelines

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This article has been chosen as particularly suitable for reading and discussion in a Journal Club format. The following questions are posed to stimulate thoughtful critique and exchange of opinions, possibly leading to changes on your unit. Formulate your answers as you read the article. Photocopying of this article for group discussion purposes is permitted.

1. To what extent are we aware of the National Comprehensive Cancer Network clinical practice guidelines for pain management? Are they (or some alternate set of official guidelines) available on our unit?
2. Do we have written procedures to follow regarding pain management practices? To what extent do we follow the guidelines?
3. What portion of our patients experiences mild, moderate, or severe pain?
4. Is pain assessed in our patients systematically (i.e., as a fifth vital sign)?
5. What would a survey of our reassessment practices or documentation likely demonstrate?
6. What short-term strategies can we employ to improve our pain management techniques?
7. What long-term, more permanent goals for improved pain management can we consider, and how might we achieve those goals?

At the end of the session, take time to recap the discussion and make plans to follow through with suggested strategies.

Purpose/Objectives: To improve nursing pain reassessment practices using a research utilization model and advanced practice nurses (APNs).

Design: A pre- and postintervention one-group design.

Setting: A cancer hospital located in the western United States.

Sample: 42 oncology RNs from the inpatient staff of medical or surgical oncology units working at least 24 hours per week.

Methods: National Comprehensive Cancer Network clinical practice guidelines were adopted. Interventions included one-on-one feedback regarding reassessment practices and nursing pain rounds. Instruments used were Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP), Pain Reassessment Data Tool, and Pain Competency Evaluation (PCE).

Main Research Variables: Independent variables were pain rounds and one-on-one feedback. Dependent variables were PCE scores, percentage of pain reassessment documentation, and NKASRP test scores.

Findings: Changing staff pain practices requires more than education. Barriers may be overcome through careful planning, using a systematic change process such as a research utilization approach. NKASRP and PCE scores and a percentage of reassessment documentation reached statistically significant increases postintervention.

Conclusions: Adapting research recommendations allowed staff to create unit-specific solutions, evaluate practice changes, establish research partnerships, and use research in bedside care. Staff increased their proficiency in pain reassessment practices after the intervention.

Implications for Nursing: Research utilization models bring about desired practice changes under APN leadership. Aligning pain reassessment practices with clinical pain guideline recommendations promotes improved pain management through better reassessment documentation.

Key Points . . .

➤ Ineffective pain management persists despite numerous clinical practice guidelines for pain.

➤ Research demonstrates that poor staff reassessment practices and lack of documentation impede pain relief for patients.

➤ Advanced practice nurses may bridge the gap between application of clinical practice pain guideline recommendations (e.g., frequency of reassessment) and clinicians by diffusing innovations and interventions depicted in the guidelines.

➤ Research utilization models incorporating organizational change strategies may be used to align staff practice with clinical practice guidelines.

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Despite well-established clinical practice guidelines designed to manage pain, deficits in implementing appropriate pain management continue to exist. Poor staff reassessment practices and lack of documentation are two major deficits that impede patients' pain relief (Herr et al., 2004; Rutledge & Donaldson, 1998; Vallerand, 1997). One approach to foster the use of clinical practice guidelines by bedside clinicians is to involve advanced practice nurses (APNs) to help link clinicians and guideline recommendations. Pain management deficits may be addressed through the use of research utilization models. The models may be focused on individuals or organizations; however, models must emphasize the use of change strategies and evidence-based practice approaches. Research utilization is a tool for identifying and implementing strategies to align nursing practice with well-known clinical guidelines, such as those created by the National Comprehensive Cancer Network (NCCN). In daily oncology nursing practice, evidence-based practice provides a foundation to allow staff to incorporate treatment recommendations into the provision of care (Jassak, 2001).

The Joint Commission on Accreditation of Healthcare Organization ([JCAHO], 2000) standards for acute care settings clearly mandate not only pain assessment in all patients but also pain reassessment in response to interventions. Compliance with JCAHO pain standards remains problematic for institutions. Cohen et al. (2003) reviewed the charts of 117 patients with cancer experiencing pain in five hospitals. A majority of charts did not contain pain assessment and management documentation; however, for patients with documented pain, 34% in the outpatient setting and 44% in the inpatient setting were reassessed. Although staff pain assessment practices have improved greatly in many institutions, improving pain reassessment practices remains a challenge. At the authors' institution, initial efforts have focused successfully on nursing education as a means to improve staff pain assessment and interventions. However, strategies to improve staff reassessment following interventions for pain have not been explored.

Changing staff's clinical practices may be focused on increasing staff knowledge, but it is seldom accomplished via continuing education alone. Changing behavior requires examination of system, provider, and environmental influences (Bucknall, Manias, & Botti, 2001; McCaughan, Thompson, Cullum, Sheldon, & Thompson, 2002; Rousseau & Tijoriwala, 1999; Willson, 2000). Altering assessment practices related to the complexity of pain assessment requires more than an in-service session (Francke, Luiken, de Schepper, Abu-Saad, & Grypdonck, 1997). Thus, a comprehensive program with multifaceted approaches is necessary to attain desired staff practice changes.

In this article, Rutledge and Bookbinder's (2002) theories of knowledge utilization (e.g., diffusion, linkage) are described, as well as evolving nurse models of research utilization. APNs may serve as linkage agents and assist staff nurses to integrate research findings into practice by use of research utilization models. The overall goal was to improve pain reassessment and documentation within one hour of medication administration in accordance with NCCN clinical guideline recommendations for reassessment.

Literature Review
Pain Management Clinical Practice Guidelines

Integrative reviews of best practices for pain management exist, such as those in the Cochrane Database of Systemic Reviews. Recent pain integrative reviews found in the Cochrane database are primarily pharmacologic in scope and include hydromorphone for acute and chronic pain, anticonvulsant drugs for acute and chronic pain, opioids for the management of breakthrough (episodic) pain in patients with cancer, and radioisotopes for metastatic bone pain (Cochrane Collaboration, 2006). To establish best practice for clinicians, clinical practice guidelines have been developed by NCCN (2004), the Agency for Health Care Policy and Research (1994), the World Health Organization (1990), and the American Pain Society (2003). The clinical practice guidelines are updated regularly, with the most recent NCCN guidelines available online in 2006 and the most recent American Pain Society guidelines published in 2005 (Gordon et al., 2005). Mercadante and Fulfaro (2005) further described the World Health Organization guidelines. However, the current study was designed in 2004 using the most current guidelines at that time. Most guidelines cover the following areas of pain management: assessment and reassessment frequency, dosing principles and analgesic administration, nonpharmacologic approaches, management of side effects, and documentation recommendations designed to improve communication among healthcare providers. Idell (2004) summarized key points of pain management guidelines.

Adherence to Guidelines and Perceived Barriers

Staff deficits in assessment and documentation are some of the most common contributing factors to the undertreatment of pain in adults (Gelinas, Fortier, Viens, Fillion, & Puntillo, 2004; Herr et al., 2004; Rutledge & Donaldson, 1998). When pain is undertreated, patients suffer needlessly. One integrative review indicated that only 48% of nurses assess systematic pain and only 24% of charts have documented pain reports (Rutledge & Donaldson). In the critical care setting, patients' self-reports of pain are recorded 29% of the time with little to no reassessment (Gelinas et al.). The pain literature indicates that poor staff reassessment practices and lack of documentation are barriers to patients' pain relief.

Perceived barriers to pain assessment and reassessment often cited by staff are (a) a nonflexible work environment, (b) RNs' decision-making ability, (c) lack of leadership support, and (d) nurses who are not comfortable using research (Baltic, Whedon, Ahles, & Fanciullo, 2002; Bucknall et al., 2001; McCaughan et al., 2002; Willson, 2000). Work-related environmental barriers include an organizational culture that does not promote individual innovativeness (Thompson, 1997), failure by the organization to assist clinicians in identifying influences on decision making, and failure by the organization to allow staff to create unit-specific solutions and evaluate changes in practice (Bucknall et al.). Without addressing barriers, efforts to implement guidelines through education alone will not succeed.

Nurses vary in their ability to make decisions based on their assessment skills for pain intensity and pain relief and their attitudes toward documentation (Vallerand, 1997). Willson (2000) explored RN decision-making factors in delivering analgesics for postoperative patients. Various influences identified in RN decision-making activities were time, a multidisciplinary team, and documentation accuracy, which point to a need to analyze RN competency and attitudes in the work environment so that adherence to guidelines can be successful.

Lack of leadership support can be a barrier. Leadership support is needed to develop clinical pain champions, recognize institutional problems related to pain, and apply institutional resources to improve pain management. Some frameworks link organizational attributes (e.g., nursing organization, staffing, care delivery model) to patient outcomes (Aiken, Sochalski, & Lake, 1997). In those frameworks, nurses enhance patient outcomes by exerting control over the practice setting, exercising their professional judgment in a timely fashion, and establishing excellent physician relationships to facilitate the exchange of important clinical information. When applying any of the models to clinical nursing practice, leaders must support nurses' judgment. Without that support, nurses may not be able to adhere to clinical pain guidelines to optimize patient outcomes.

A fourth barrier relates to the inability of staff nurses to apply research findings to improve practice. The inability may stem from problems interpreting and using complex, scientific research, lack of support for nurses to use research, lack of clinical application for nursing research, and lack of skills or interest in reviewing research (McCaughan et al., 2002). Thus, an approach to decreasing barriers needs to address multiple areas of environmental, individual, and organizational obstacles.

Research Utilization

Research utilization is a useful approach in changing clinical practice. Rutledge (1995) detailed several phases necessary to implement practice changes: (a) preparatory or thinking (e.g., type of changes, organizational level, major stakeholders, disciplines involved, financial implications), (b) approval process (e.g., who needs to approve, information required, research-based presentation, budget for change effort), (c) documentation (e.g., changes in forms), (d) education or training (e.g., staff training, information notices, personnel, timing of training, maintaining the gain), (e) budget (e.g., initial cost outlay, equipment, personnel, training and maintenance costs), and (f) evaluation of change (e.g., tools available to measure processes or outcomes of change, trial or pilot evaluation, continued monitoring). The broad scope of the steps illustrates the complexity of an existing method for applying the research utilization model to changing clinical practice. It also illustrates the need to plan a project over one to two years before successful changes can occur.

Research utilization approaches have been used to enhance pain assessment and documentation. For example, Dufault, Bielecki, Collins, and Willey (1995) described a collaborative research utilization model to change nurses' pain assessment practices. Using a quasi-experimental design, the interventional group completed a six-phase, 18-week process to change pain assessment practices; the control group did not receive interventions. Study findings revealed that 67% of the nurses indicated a positive change in the way they assessed pain. Increased knowledge led to gains in staff pain competency.

Another approach to research utilization strategies focuses on the organization (Cameron, 1998). Organizational change strategies include building a pain competency into the performance appraisal process or using APNs to spearhead research utilization initiatives through diffusion of innovations (Dooks, 2001), promoting communication between adopter and generator or researcher to link clinical staff with the body of research knowledge (Asselin, 2001), and engaging staff members in the creation of innovative unit solutions, which is likely to increase the chances that staff will adopt the desired change.

Research utilization projects have focused on the role of APNs as change agents. Melnyk and Fineout-Overholt (2002) described a project in which APNs were cultivated as evidence-based practice champions through mentorship, networking, and projects designed to disseminate best practice using well-designed studies. Janken and Dufault (2002) described how one institution partnered with nursing researchers, APNs, and staff nurses to identify how pain management could be improved through better assessment. A literature search was conducted to match institutional clinical issues to change practices; change was effected by incorporating the Wisconsin Brief Pain Inventory and behavioral observation technique into nursing documentation forms. Following education, audits were conducted using a pain management audit tool and performance feedback was provided to nursing staff. Results revealed positive changes in pain management. Rogers's (1995) theory of diffusion of innovations described elements necessary to diffuse new ideas: innovation, communication over time, and individuals in a social system. Rutledge and Bookbinder (2002) suggested combining diffusion of changes with a linkage between problem-solving and problem-generating systems; both processes fall within APNs' clinical purview. In summary, embarking on clinical practice changes requires not only knowledgeable research champions but also organizational change experts.

Summary

Pain management requires a complex, dynamic, and fluid series of assessments, interventions, and reassessment to maximize pain relief (NCCN, 2004). Staff nonadherence to clinical practice recommendations diminishes patient pain relief. Barriers to adherence occur through wide variations in nursing assessment skill, lack of perceived control over practice setting, lack of familiarity with guidelines, and a dearth of unit-specific solutions generated by staff through collaboration with researchers and APNs. To change pain management behaviors, more than education is required. Careful planning is needed to overcome barriers; therefore, a systematic process for organizational change, such as one outlined with a research utilization approach, is advisable. APNs may be a valuable asset to bridge the gap between pain guidelines practices as they lead grand pain rounds, engage staff in change activities, or change the environment to support nurse decision making (Asselin, 2001; Dooks, 2001). The organizational infrastructure, including current best practice, charting tools, and individualized feedback on performance, needed to promote success also should be set in place. Therefore, a comprehensive approach to change staff behavior regarding pain reassessment is warranted.

Purpose

The overall purpose of the current study was to improve nursing pain reassessment practices by applying a research utilization model and using APNs. The planned practice change was to induce nursing staff to consistently perform and document pain reassessment within one hour of medication

administration (short- or long-acting opioids) in accordance with the NCCN (2004) clinical recommendations for pain reassessment. The specific aims of the change project were to (a) describe the demographics of participating nurses, (b) implement interventions in pilot units consisting of grand pain rounds and one-on-one performance feedback about pain reassessment practices of participating staff, (c) identify changes in participants' knowledge and attitudes regarding pain pre- and postintervention, (d) identify changes in pain charting that occur postintervention, (e) identify changes in participants' pain competency postintervention, and (f) explore the effect of various demographic characteristics on outcomes.

Conceptual Framework

The conceptual framework was composed of the Conduct and Utilization of Research in Nursing (CURN) model, which links research and practice through principles of research utilization and planned change (Dufault et al., 1995; Horsley, Crane, & Bingle, 1978). Content of the NCCN (2004) pain guidelines provided the plan for pain reassessment.

Conduct and Utilization of Research in Nursing Model

The CURN model has seven phases, ranging from problem identification to mechanisms to maintain the innovation. Figure 1 identifies the steps and how they were used in the current study. The CURN model emphasizes the importance of working at the institutional level for research-based changes and highlights the need for research-based evidence to be implemented systematically via research-based protocols (e.g., best knowledge). Important components of organizational research utilization programs include a designated task force, multidisciplinary educational thrust, realistic timelines (one to two years), staff marketing, quality improvement, and institution-specific policy and pilot work.

National Comprehensive Cancer Network Guidelines

NCCN (2004) clinical practice guidelines for pain management were selected for their high level of evidence and because the algorithms are easy to follow by healthcare providers. The guidelines reflect category 2A evidence, consisting of at least one well-designed controlled study without randomization. NCCN's Practice Guideline for Cancer Pain clearly states that when titrating oral or IV pain medication to control pain, reassessment should occur within 60 minutes of oral dosing and within 15 minutes of IV dosing. Reassessment is critical because the next steps of the pain algorithm are predicated on patient response. For example, when pain scores are unchanged following an intervention, nurses must administer a second, higher dose; however, a decrease in pain scores by 50% or more would indicate that an effective dose was selected for the original intervention. When nurses fail to perform and document reassessment data, the opportunity for optimal pain management is lost and continuity is disrupted from shift to shift, as well as among other healthcare team members. Suboptimal pain management has grave implications for patient quality of life, activities of daily living, and recovery from trauma (Idell, 2004; NCCN).

Identify the Problem
- Poor pain reassessment scores warrant formation of an interdisciplinary team.
- The team reviews data and conducts root cause analysis.

Critique Research
- Literature search terms include pain assessment, reassessment, and barriers.
- A table of evidence is generated.
- The team critiques strategies, analyzing merit and feasibility.

Transform Knowledge Into Clinical Standard or Protocol
- Strategies selected for use
  - Build pain competency based on the National Comprehensive Cancer Network guidelines.
  - One-on-one feedback in a bar graph depicting individual staff practices for pain reassessment
  - Advanced practice nurse–led grand pain rounds for patients' pain scores
  - Policy infrastructure changes

Pilot and Evaluation
- Six-month pilot study is conducted on medical or surgical units.
- Success pilot study is evaluated with a pre- and postintervention study.
  - Chart audits
  - Knowledge and attitudes survey regarding pain scores
  - Competencies

Decision to Go Forward
- Executive team approval is sought.
- Housewide training is devised for a new pain policy that is revised to meet National Comprehensive Cancer Network guidelines.
- Performance improvement plan or criteria is established and implemented.

Diffusion of New Practice Throughout Hospital
- Marketing or publicity for pain campaign, including posters, classes, Intranet resource site, and performance management reports
- Quarterly reports to clinical oversight bodies (e.g., Joint Commission functional teams and quality councils, medical executive teams), human rights, and organization ethics, quality assurance groups

Maintain Gains
- Reflected in
  - Compliance in reassessment documentation
  - Greater staff participation in grand pain rounds
  - Pain competency trending

Figure 1. Applying the Conduct and Utilization of Research in Nursing Model to Pain Assessment at the City of Hope National Medical Center

Methods

Design

A one-group pre- and postintervention design was selected for implementation. The intervention consisted of specific strategies designed to improve staff adherence to the NCCN guideline on pain reassessment.

APNs identified strategies from a critique of the research literature regarding how to improve staff pain reassessment practices (Asselin, 2001; Bucknall et al., 2001; Dooks, 2001; Dufault et al., 1995; Duncan & Pozehl, 2001; Vallerand, 1997). The first strategy was to provide individual performance feedback on the nurses' use of pain management practice guideline recommendations (Duncan & Pozehl). The study coordinator gathered pain documentation data from five separate charting episodes for each study participant. Individual performance

Table 1. Pilot Timeline for Assessment, Interventions, and Measure Outcomes

Study Activity	1	2	3	4	5	6	7	8	9	10
Accrue subjects.	X	–	–	–	–	–	–	–	–	–
Complete demographic survey.	X	–	–	–	–	–	–	–	–	–
Test subjects preintervention using the Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP).	X	–	–	–	–	–	–	–	–	–
Conduct preintervention chart audits (five charts per subject) using the Pain Reassessment Data Tool (PRDT).	X	X	–	–	–	–	–	–	–	–
Collect subjects' preintervention Pain Competency Evaluation (PCE) scores.	X	–	–	–	–	–	–	–	–	–
Conduct grand pain rounds on each unit and generate posters.	–	–	X	X	X	–	–	–	–	–
Provide one-on-one feedback of chart audit results in a bar graph and participants' NKASRP scores.	–	–	X	X	–	–	–	–	–	–
Conduct postintervention chart audits using the PRDT as subjects receive feedback and attend rounds.	–	–	–	–	X	X	–	–	–	–
Repeat one-on-one feedback following the second chart audit.	–	–	–	–	–	–	X	X	–	–
Test subjects postintervention using the NKASRP.	–	–	–	–	–	–	–	–	X	–
Collect postintervention measurement of PCE scores.	–	–	–	–	–	–	–	–	X	–
Examine results.	–	–	–	–	–	–	–	–	–	X

(Columns 1–10 headed "Study Month")

concerning pain assessment and reassessment was summarized in a bar graph and reviewed in private, one-on-one feedback sessions with the participant and APN who served as principal study investigator and study coordinator. A second strategy involved conducting a series of unit-based grand pain rounds using a case study approach. APNs served as a link between best practice guidelines and bedside clinicians. Under the guidance of the APNs, staff selected a complex pain management case from the unit, reviewed NCCN clinical practice pain guidelines and recommendations for improving pain management, and used critical thinking to create unit-specific strategies for applying guidelines to patients' care. Posters containing rounds content were created by the study coordinator and APN and were placed on units for review by staff unable to attend the rounds.

Setting

The current study was conducted at a National Cancer Institute comprehensive cancer center located in the western United States. An institutional review board reviewed and approved the study.

Sample

A sample of 50 oncology RNs was planned for the study from a potential sample of 55. Thirty-two medical oncology nurses and 23 surgical oncology nurses were eligible. Nurses were eligible if they were from the inpatient staff of a medical or surgical oncology unit and worked at least two 12-hour shifts per week. Fifty-three nurses were enrolled for a 96% participation rate. However, four staff members were lost to attrition prior to completion of study interventions (e.g., limited time to complete study measures, medical leave). An additional seven subjects were unable to complete all of the study measures (two individuals were placed in a temporary charge position and did not care for patients, three did not care for enough patients in pain to permit collection of the percentage of reassessment, and two did not complete their pain competency at the end of the study); therefore, a total of 42 nurses completed the study. The individual demographic

characteristics of the nurses who did not complete the study were compared to the characteristics of the nurses with completed data using the Mann-Whitney test and a one-way analysis of variance. No significant differences were found between the two groups.

Table 2. Sample Characteristics

Characteristic	n	%
Gender		
Male	3	7
Female	39	93
Age range (years)		
20–40	11	26
41–50	21	50
51–60	10	24
Ethnicity		
Asian	16	38
White or Caucasian	15	36
Other	11	26
Education		
Diploma	4	10
Associate degree	18	43
Bachelor's degree	20	48
Years in nursing		
$\bar{X}$ = 14.9	–	–
SD = 12.03	–	–
Range = 1–41	–	–
Years employed at National Comprehensive Cancer Network institution		
$\bar{X}$ = 9.3	–	–
SD = 8.2	–	–
Range = 1–28	–	–
Years on the same unit		
$\bar{X}$ = 8.8	–	–
SD = 7.2	–	–
Range = 1–27	–	–

N = 42

Note. Because of rounding, not all percentages total 100.

Instruments

Instruments were selected to describe the population of participating nurses and measure changes in pain management. The **Demographic Survey Tool** included gender, age, ethnicity, years in nursing, years at institution, education background, and length of time on the current unit.

The **Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP)** is a well-used test with established validity and reliability. Developed by Ferrell, McGuire, and Donovan (1993), the 39-item test contains 22 true or false questions, 13 multiple-choice questions, and 2 case studies (with two questions or case studies). The content includes aspects of pain assessment or reassessment pharmacologic and nonpharmacologic interventions. Four questions relate to reassessment content. Scoring consists of the total test score and separate scores for the four reassessment questions.

The **Pain Reassessment Data Tool (PRDT)** consists of 11 questions used to audit charts for pain reassessment documentation. Items were selected from an existing documentation audit tool used at the institution for quality assurance studies on pain management. Questions on pain reassessment included (a) Was the effectiveness of the intervention reassessed (as evidenced by the pain score) within one hour? (b) Are the pain level scores or nonverbal signs or symptoms of pain recorded with every set of routine vital signs? and (c) Did the reassessment pain score reach the stated acceptable level for the patient as stated in the initial admission assessment? Five charts were selected among patients cared for by a nurse within a one-month time period to evaluate reassessment practices using the audit questions. Charts were not audited in the first 24 hours of patient admission to allow for initiation of interventions to stabilize the patient. Scoring was calculated as a percentage of reassessment (i.e., the total number of "yes" answers for each question divided by the number of charts audited).

The **Pain Competency Evaluation (PCE)** consisted of one item on pain reassessment that was a part of an annual performance evaluation used at the institution for all nurses. The pain management competency standard is "the nurse manages pain effectively using assessments and interventions within the RN scope of practice and makes referrals when care needs exceed that scope" (City of Hope, 2006). The competence criteria states that the nurse "assesses pain relief within a reasonable period of time following administration of medication and documents findings" (City of Hope). The pain policy standard of care instructs RNs to reassess pain within one hour of intervention; therefore, the period of time was considered reasonable. The methods of assessment are direct observation, return demonstration, document review, patient feedback, program class completion, discussion with employee, and peer review. The item is scored from 1 (does not meet) to 4 (exceeds performance expectations). The evaluation provided another view of nurses' pain reassessment behaviors.

Analytical Approach

Data were coded and entered into the SPSS® version 8.0 (SPSS Inc.). Descriptive statistics (e.g., frequency distributions) were used to examine the demographic data. Pre- and postintervention test scores for the NKASRP were analyzed using paired t tests. Paired t tests were performed for pre-

and postintervention PCE scores. Pre- and postintervention scores for the percentage of reassessment were analyzed using paired t tests. A p value of 0.05 was considered significant.

Study Procedure

Posters were placed on units and invitation letters with an informed consent form were distributed at staff meetings by the study coordinator or principal investigator (PI). The PI described the study in staff meetings on the pilot units. At that time, the PI emphasized that the study was voluntary. All study activities were within routine RN function and would be completed during scheduled work time. No one was asked to come in on a day off to participate. All study procedures were described in the consent form distributed by the PI. Staff who chose to participate returned the completed consent form to the PI or placed the consent form in an envelope in a locked box at the nursing station. That method was used to ensure anonymity of participants from other staff and management. Outside of the staff meeting, the study coordinator and PI visited the units to discuss the study and gather informed consent. The PI was a clinical nurse specialist on one of the pilot units but had no relationship with the second unit. The study coordinator had no affiliation with either pilot unit.

Table 3. Nurses' Knowledge and Attitudes Survey Regarding Pain Results

Question	Pretest		Post-Test	
Correct scores				
X̄	71.1%		76.2%	
SD	15.1		12.6*	
Range	38%–95%		44%–95%	

Question	n	%	n	%
Analgesics for postoperative pain should initially be given				
a. Around the clock on a fixed schedule.*	29	69	31	74
b. Only when the patient asks for the medication.	13	31	10	24
c. When the nurse determines.	–	–	1	2
Analgesia for chronic cancer pain should be given				
a. Around the clock on a fixed schedule.*	38	90	40	95
b. Only when the patient asks for the medication.	4	10	2	5
c. When the nurse determines.	–	–	–	–
Two patient cases were presented. For each, subjects were asked to make decisions about the administration of pain medication based on patient reassessment.				
3a. Pain scored rated as 8.[a]	32	76	40	93
All other pain scores (1–10 scale)	10	24	2	7
3b. Gave morphine 3 mg via IV push[a]	18	43	29	69
All others	24	57	13	31
4a. Pain scores rated as 8.[a]	37	88	41	98
All other pain scores (1–10 scale)	5	12	1	2
4b. Gave morphine 3 mg via IV push[a]	31	74	35	83
All others	11	26	7	17

N = 42

* p = 0.001

[a] Correct answer

The sequence of events in the intervention is identified in Table 1. The sequence provided for sufficient time to accrue subjects, carry out baseline measurements, conduct grand pain rounds, provide feedback to participants, and perform repeat measurements.

Results

Demographics

The final sample was comprised of 27 participants from the medical oncology unit and 15 from the surgical oncology unit (see Table 2). Ninety-three percent were women, and 50% were 41–50 years old. The most prevalent ethnicity was Asian (38%), followed by Caucasian (36%). Forty-eight percent had a bachelor's degree, and 43% had an associate degree. Subsequent analyses of pre- and postintervention scores were conducted on completed data only.

Knowledge and Attitudes

Analysis of the NKASRP involved paired t tests comparing pre- and postintervention scores. The preintervention baseline mean test score was 71.1%, and the postintervention mean test score was 76.2% ($p = 0.001$). Four test questions addressing reassessment were analyzed separately. All answers demonstrated increases in post-test mean scores; however, none was statistically significant. Scores for the overall test and for reassessment questions are located in Table 3.

Mastery, a concept relevant to analyzing test scores (Hambleton & De Gruijter, 1983), provides valuable information even when statistical significance is not reached. Thirty-eight percent of subjects attained mastery (defined as 80% or better correct response to the question) for the question of pain

reassessment within one hour on the pretest; a 31% increase was seen in mastery, with 69% of population reaching mastery of question response on the post-test. Other gains in mastery were seen in the question found on the PRDT: "Was the pain score recorded with routine vitals?" (increase from 69% to 81%); however, that gain in mastery was not statistically significant (see Table 4).

Pain Reassessment

Findings from the PRDT revealed preintervention documentation of reassessment within one hour occurred 61% of the time, whereas postintervention documentation of reassessment within one hour occurred 78% of the time. The increase of 17% was significant at the $p = 0.004$ level using a two-tailed t test. Mean scores for the question, "Did the reassessment pain score reach patient's tolerated goal?" increased from 40% to 70% but were not statistically significant.

Competency

In terms of the PCE data, the preintervention mean score was 3.05. Postintervention, the PCE mean score was 3.38 (n = 40). The score was statistically significant at the $p = 0.000$ level.

Effect of Demographic Characteristics on Outcome

Comparison graphs were developed to illustrate the percentage of reassessment, NKASRP scores, and PCE scores pre- and postintervention in the context of certain demographic traits such as age, years of nursing, and educational background. In Figure 2, percent reassessment was analyzed based on RN age. The preintervention age range with the highest percent reassessment was 41–50 years. The postintervention

Table 4. Pain Reassessment Data Tool Results

Question	Score (%)[a]	Preintervention (N = 42)		Postintervention (N = 42)		Mastery Improvement (%)
		Yes	%	Yes	%	
Was the effectiveness of the intervention reassessed (as evidenced by the pain score) within one hour?	100	5	12	16	38	31*
	80	11	26	13	31	
	60	12	29	5	12	
	40	7	17	7	17	
	20	6	14	1	2	
	0	1	2	–	–	
Are the pain level scores or nonverbal signs or symptoms of pain recorded with every set of routine vital signs?	100	17	41	27	64	11
	80	12	29	7	17	
	60	6	14	6	14	
	40	3	7	1	2	
	20	3	7	1	2	
	0	1	2	–	–	

| Question	Response	$\overline{X}$	%	$\overline{X}$	%	Mastery Improvement (%)
Did the reassessment pain score reach the stated acceptable pain level for the patient as documented in the initial admission assessment?	Yes	17.0	40	29.4	70	30
	No	6.4	15	2.2	5	
	None	18.6	44	10.4	25	

* $p < 0.05$

[a] Participants who scored 80% or more were designated as achieving mastery.

Note. Because of rounding, not all percentages total 100.

a. Percent reassessment and RN age (N = 42)
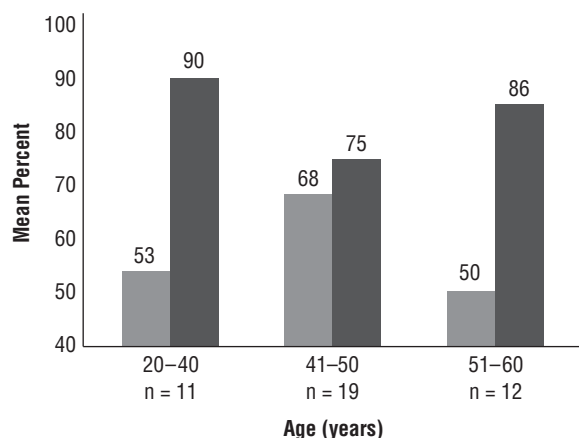
b. Nurses' Knowledge and Attitudes Survey Regarding Pain scores and RN age (N = 42)
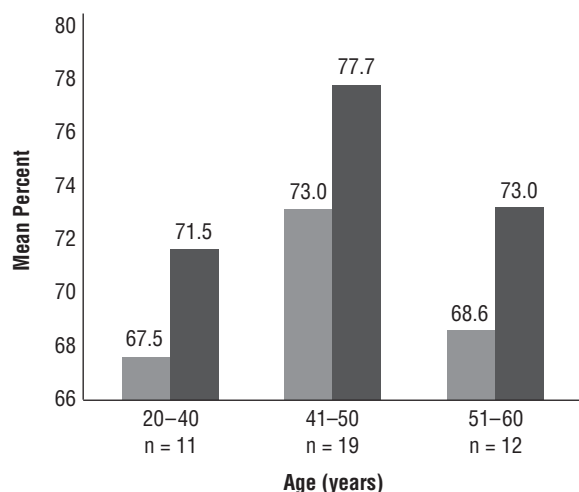
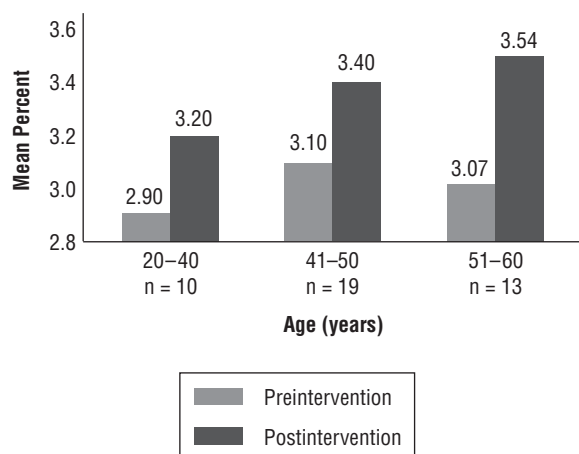**c. Pain Competency Evaluation scores and RN age (N = 42)**

Figure 2. Age Comparisons for Pre- and Postintervention Scores

age range with the highest percent reassessment was 20–40 years. NKASRP scores were analyzed based on RN age. Preintervention test scores were highest in those aged 41–50, and the group gained a mean score increase of 4% postintervention, which was similar across the other age ranges. PCE score analysis based on RN age showed the highest baseline score in those aged 41–50 and the greatest gain in postintervention score in those aged 51–60.

In Figure 3, percent reassessment was analyzed based on years in nursing. The greatest gain occurred in the most experienced nurses (aged 26–41 years). All levels of experience exhibited positive gains in percent reassessment. The highest baseline NKASRP scores occurred in nurses with 15–25 years of experience. That group's scores gained only one point postintervention. Comparable gains in NKASRP scores postintervention were seen in the nurses with 7–14 and 26–41 years of experience. The nurses with 15–25 years of experience had the highest preintervention PCE score in contrast to all other groups. Postintervention, the greatest percent change in PCE score was seen in the group with 26–41 years of RN experience.

In Figure 4, percent reassessment was analyzed based on educational background. All education levels experienced gains. Diploma nurses had the smallest gain (10%). The diploma-prepared RNs had the lowest baseline and postintervention NKASRP scores. Postintervention, RNs with an associate degree gained three points and RNs with a bachelor's degree gained seven points. Similar trends were seen with pre- and postintervention PCE scores. The lowest baseline PCE score was for diploma-prepared RNs; however, the group had the largest increase in PCE score postintervention.

Discussion

The results of the study's analysis revealed successful improvement in the practice of pain management, especially in relation to pain reassessment. The statistically significant results shown by increased PCE scores, increased NKASRP scores, and improved percent reassessment charting indicate a very successful pilot test. Research utilization using the CURN organizational model led to the construction and implementation of interventions such as grand pain rounds and one-on-one feedback mechanisms, which were successful in changing pain management practice. Adaptation of research recommendations (Asselin, 2001; Bucknall et al., 2001; Cameron, 1998; Dooks, 2001; Dufault et al., 1995) had the following effects: (a) fostered staff willingness to create unit-specific solutions and evaluate changes in practice; (b) established research utilization partnerships between staff and nurse researchers; (c) used innovative ways to bring research to the bedside; (d) employed effective organizational change strategies such as role modeling, staff empowerment, and meaningful communication; and (e) promoted close contact between staff RNs adopters and APN research generators.

The intervention design allowed the researchers to decrease individual and organizational barriers. The individual barrier lack of knowledge regarding pain management was decreased through grand pain rounds and posters placed on the units. The increased staff knowledge was reflected in changed practice patterns (i.e., improved reassessment). Organizational barriers such as the time to do rounds and

a. Percent reassessment and years in nursing (N = 42)
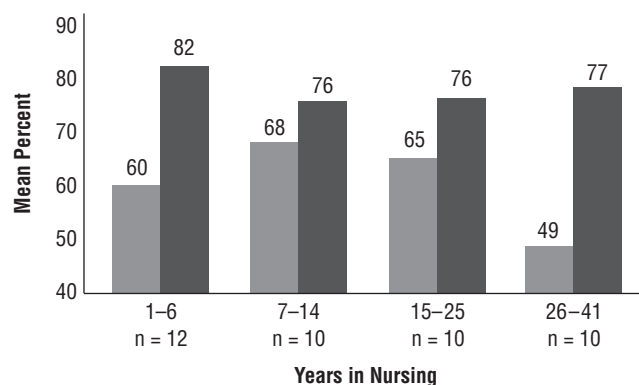
b. Nurses' Knowledge and Attitudes Survey Regarding Pain scores and years in nursing (N = 42)
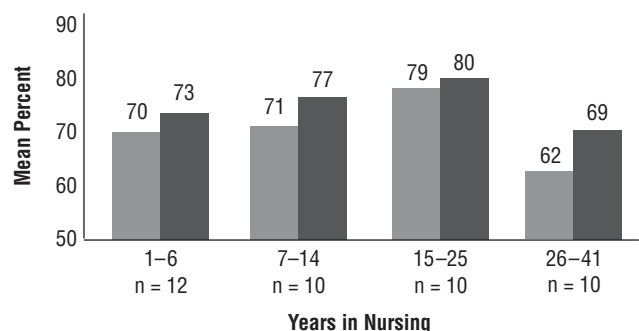
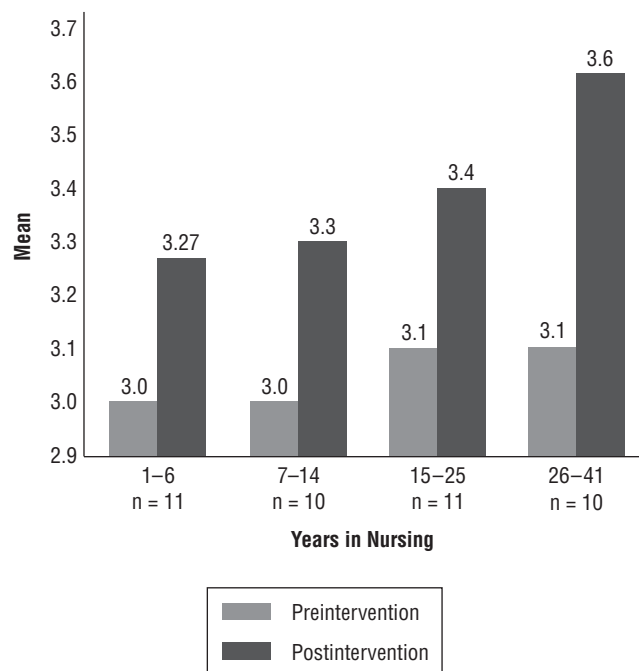**c. Pain Competency Evaluation scores and years in nursing (N = 42)**

Figure 3. Years in Nursing Comparisons for Pre- and Postintervention Scores

individual staff meetings were overcome by allocating resources such as an APN. The intervention design capitalized on the strength of using APNs to bring research to bedside clinicians through diffusion of innovation and linkage between problem generator and problem solver. A successful increase in pain reassessment replicated results from Dufault et al. (1995). Use of the organizational change strategy enhanced buy-in among key stakeholders and contributed to pilot success. The PCE score increase replicated the increase in staff competency and knowledge obtained in the study by Dufault et al.

The demographic analysis plotting subject characteristics against percent reassessment, NKASRP, and PCE scores was very revealing. Nurses aged 20–30 years demonstrated the greatest gain in percent reassessment, which may indicate that increased attention, personalized feedback, and pain rounds are effective in changing reassessment behaviors in younger nurses. However, the next highest gain in percent reassessment occurred in those aged 51–60, which may imply that experienced nurses were thought leaders and early adopters of the practice change. In terms of the NKASRP, baseline mean scores varied across the age ranges; however, each group gained across age ranges. Mastery of reassessment knowledge (as measured by the NKASRP) also increased significantly, demonstrating intervention efficacy. Highly significant gains (0.295–0.41) were seen in PCE scores of all age ranges. Because the study was blinded (i.e., nurse managers did not know who among their staff were enrolled), the gain in competency is a powerful statement of intervention efficacy.

Years of nursing as plotted against percent reassessment, NKASRP, and PCE scores yielded some surprising findings. The most experienced RNs had the lowest level of pain reassessment documentation; the researchers believe that the group did not necessarily value documentation to the same degree as less experienced RNs. Whether the finding is attributed to RN complacency, environmental influences on decision making, or lack of consequences commensurate with poor charting practices is an area open to additional research. The comparisons between the NKASRP and years of experience in nursing showed a surprisingly negative relationship—the nurses with the greatest experience had the lowest mean scores. Perhaps more research is needed to clarify which characteristics would predict lower scores in more experienced RNs. Possible areas to explore would be type of educational program, early socialization into the role of the RN, and the phenomenon of burnout. All groups benefited, however, from interventions as evidenced by increased NKASRP scores. Years of experience in nursing appears to be positively related to PCE scores because the most experienced nurses achieved the greatest increase in PCE scores postintervention.

Limitations and Recommendations

One limitation of the pilot was its small sample size; however, a large-scale dissemination project enrolling 100 subjects is already under way at the authors' institution. A second limitation of the current study is that all nurses and some managers were exposed to the interventions' grand rounds and posters, but managers were not apprised of subject participation in the study. In addition, nonparticipating RNs probably gained from grand rounds and poster review,

a. Percent reassessment and educational background (N = 42)
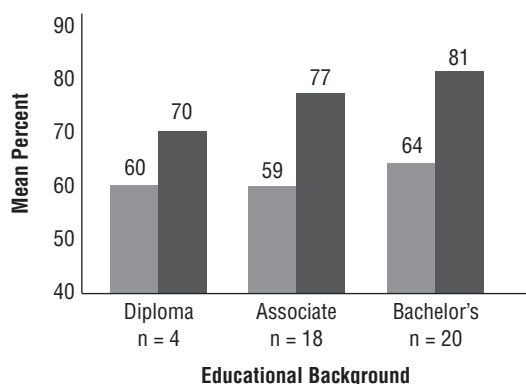
b. Nurses' Knowledge and Attitudes Survey Regarding Pain scores and educational background (N = 42)

c. Pain Competency Evaluation scores and educational background (N = 42)
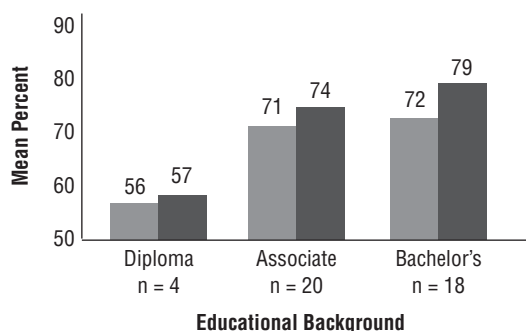
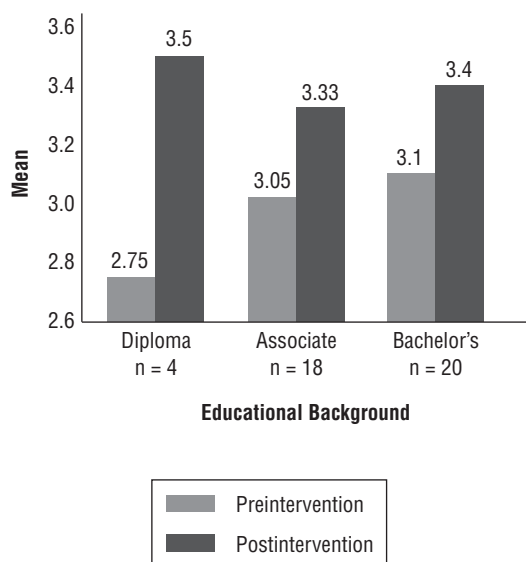Preintervention
Postintervention

Figure 4. Educational Background Comparisons for Pre- and Postintervention Scores

which may have influenced the pain competency scores obtained during their annual performance evaluation. Nonparticipants did not receive the study intervention of one-on-one feedback regarding pain reassessment performance. A third limitation is that the study was conducted using oncology nurses from a national comprehensive cancer center as subjects. Thus, results may not generalize to a community cancer setting.

Implications for Nursing

The clinically and statistically significant increase in NKASRP test scores implies that learning is effective when clinical practice guidelines are applied to an actual case study in which staff are familiar in the setting of grand pain rounds. Principles of adult learning suggest that interactive, reality-based clinical scenarios enhance knowledge and the application of that knowledge. Based on staff comprehension of the significance of pain reassessment following intervention (as described in the NCCN algorithm), staff can be assumed to be more willing to follow best practice recommendations to effect better pain management (i.e., adopt the innovation of reassessment following intervention).

The clinical significance of improved documentation of pain reassessment, indicated by the statistically significant improvement in mastery, ensures better communication among caregivers when evaluating efficacy of interventions. If a patient's chart clearly demonstrates that use of a pharmacologic agent is not effective in reducing pain by at least 50% or that the patient's stated tolerable acceptable level has not been reached, valuable information may be shared with physicians, pharmacists, and other team members to evaluate new therapeutic options.

The clinical importance of the statistically significant improved pain competency evaluation scores is that participants demonstrate a higher level of performance in a core competency of oncology nurses—pain management. According to the Oncology Nursing Society (Given et al., 2004), pain has been identified as a nursing-sensitive patient outcome; therefore, nursing interventions that adhere to recommendations for best practice (i.e., NCCN pain guidelines) are predicted to improve patient outcomes. Although patient outcomes were not addressed directly, the present study's results point indirectly to better pain management through increased pain reassessment following interventions.

Conclusion

Based on the study findings, the use of NCCN clinical practice guidelines can provide a valuable resource for nurses to improve the level of practice and care outcomes. Individual feedback on performance can be valuable in improving practice. The research utilization model is a fertile model for exploring strategies to change behavior. Finally, the successful completion of this project illustrates the value that APNs bring as links to diffuse innovation in institutional change.

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   (6) Main Research Variables
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