

Research on the Frontlines of Healthcare: A Cooperative Learning Approach

Anne Panik MS, RN, NEA-BC
Lehigh Valley Health Network, Anne.Panik@lvhn.org

Joanna L. Bokovoy DrPH, RN
Lehigh Valley Health Network

Elizabeth Karoly MBA
Lehigh Valley Health Network, Elizabeth.Karoly@lvhn.org

Kimberly Badillo RN
Lehigh Valley Health Network, Kimberly.Badillo@lvhn.org

Charlotte Buckenmyer RN, MS
Lehigh Valley Health Network, Charlotte.Buckenmyer@lvhn.org

See next page for additional authors

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Authors

Anne Panik MS, RN, NEA-BC; Joanna L. Bokovoy DrPH, RN; Elizabeth Karoly MBA; Kimberly Badillo RN; Charlotte Buckenmyer RN, MS; Courtney Vose RN, MSN, MBA, APRN; John F. Wheary DO; Gina M. Sierzega MBA; Lynn M. Deitrick RN, PhD; and Andrew Hyduke

Research on the Frontlines of Healthcare

A Cooperative Learning Approach

Anne Panik ▼ Joanna Bokovoy ▼ Elizabeth Karoly ▼ Kimberly Badillo
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 Gina Sierzega ▼ Lynn Deitrick ▼ Andrew Hydeuke

Editor's Note

Additional information provided by the authors expanding this article is on Editor's Website at <http://www.nursing-research-editor.com>.
 Materials documenting the review process for the article are posted at <http://www.nursing-research-editor.com>.

- ▶ **Background:** Evidence-based practice is a common goal in hospitals, but learning about research so that the practice can be done is often challenging for clinicians.
- ▶ **Objectives:** The aims of this study were to (a) develop a process that supports organizational and staff development while conducting research and (b) conduct a research study in the emergency department (ED) to examine patient population, satisfaction, and waiting room issues.
- ▶ **Methods:** A multidisciplinary team of clinicians and scientists was assembled to learn and do research while evaluating the ED waiting room of a Level I trauma center. A cooperative learning method approach was used to teach research concepts as the study was designed and implemented.
- ▶ **Results:** The team demonstrated their knowledge and understanding of research concepts by being involved actively in the creation and implementation of the preintervention study. Using information from photographs, observations, and a questionnaire, the team identified the following key dissatisfaction areas: (a) atmosphere (including comfort with environment, neatness and cleanliness, and noise), (b) telephones, (c) parking and thoroughfare, (d) professional behavior and staff presence (including personal attention), (e) security, and (f) triage and confidentiality.
- ▶ **Discussion:** The model of working in partnership with researchers and using cooperative, collaborative research is an effective way to evaluate and address issues related to quality of care while learning about the research concepts needed to put evidence into practice.
- ▶ **Key Words:** patient • satisfaction • trauma services

At Lehigh Valley Hospital and Health Network (LVHNN), an 807-bed tertiary-care magnet hospital and Level I trauma center, there exists a culture of fostering evidence-based patient care and encouraging research activities among staff; researchers with clinical backgrounds work closely with clinical leaders and staff members. However, assuring that all processes are research based is often daunting because of the multitude of processes and activities impacting patient care and of the challenge of finding, understanding, and applying research to support the processes.

Integrating research into practice appears to be even more effective when the researcher finds ways to incorporate the process of research into the day-to-day activities of bedside nurses (Endo, Miyahara, Suzuki, & Ohmasa, 2005). This finding was expanded to include administrators and other healthcare professionals after reviewing literature, such as research as part of a professional practice model (Ingersoll, Witzel & Smith, 2005), addressing *perceived* barriers to the understanding and use of research in practice (Fink, Thompson, & Bonnes, 2005), using a team and process improvement method (Buckley, Burns,

Anne Panik, RN, MS, CNAA, is Administrator, Patient Care Services; Joanna Bokovoy, RN, DrPH, is Director, Healthcare Research; Elizabeth Karoly, RRT, MBA, is Senior Analyst; Kimberly Badillo, RN, ACRN, is Patient Representative; Charlotte Buckenmyer, RN, MS, CEN, is Director, Emergency Department; Courtney Vose, RN, MSN, CRNP, is Director, Emergency Department; John Wheary, MD, is Emergency Physician; Gina Sierzega, MA, is Grants/Research Specialist; Lynn Deitrick, RN, PhD, is Medical Anthropologist; and Andrew Hydeuke, BA, is Management Engineer, Lehigh Valley Hospital and Health Network, Allentown, Pennsylvania.

& Bleck, 2005; Donaldson, Brown, Aydin, Bolton, & Rutledge, 2005), and discussing the development of a community of scholars who support each other (Schmidt Bunkers, 2005) and the cooperative learning approach (Thousand, Villa, & Nevin, 1994).

Cooperative Learning Approach

Historically, leaders facing challenges in a clinical environment request a specialist researcher to conduct a study of the environment and to share the results. This is one approach to effect change, but the clinical leader must rely on the researcher's understanding of the clinical environment and must then interpret how these results can be used to improve the environment. The cooperative learning approach, in contrast, encourages a collaborative environment in which all team members assume accountability throughout the research process. Johnson, Johnson, and Smith (1991) summarized cooperative learning as a type of instruction involving students working in teams to accomplish a common objective using a five-step process:

1. *Positive interdependence*: Team members rely on one another to achieve the goal. If any team member fails to do his or her part, everyone suffers the consequences.
2. *Individual accountability*: All learners in a group are held accountable for completing their share of the work and for learning all of the concepts taught.
3. *Face-to-face promotive interaction*: Although some of the group work may be delegated to and completed by specific individuals, some must be done interactively, with group members providing each another with feedback, challenging the conclusions and reasoning, and perhaps most importantly, teaching and encouraging one another.
4. *Appropriate use of collaborative skills*: Learners are encouraged and helped to develop and practice trust building, leadership, decision making, communication, and conflict management skills.
5. *Group processing*: Team members set group goals, periodically assess what they are doing well as a team, and identify the changes that they will make to function more effectively in the future.

Cooperative learning is successful for several reasons. In most cases, individuals learn more by actively doing something than by watching and listening (Bonwell & Eison, 1991), and cooperative learning promotes action. Cooperation also fosters knowledge and understanding. Individuals who have difficulty learning often give up when they work alone or do not understand something. A cooperative approach offers them the confidence to keep going. Strong learners faced with the task of explaining and clarifying material to weaker learners often find gaps in their own understanding and then study to fill in those gaps. Learners working alone may tend to procrastinate, completing assignments late or skipping them altogether. However, when they know that others are counting on them, they are often driven to do the work in a timely manner. Learners working competitively have incentives

not to help one another; when working cooperatively, they are rewarded for helping (Johnson et al. 1991).

Preliminary Work: Introduction to Cooperative Learning

The study team consisted of healthcare professionals employed at LVHVN, where an average of 113,000 patients per year are seen at three emergency department (ED) sites. At the Level I trauma center site, LVHVN's largest ED, more than 50,000 patients were treated in 2004 (49% of all hospital admissions), and it was designated as the study site. Like other EDs nationwide, there was overcrowding due to continued pressure for demand for hospital services from the community.

An experienced ED nursing administrator led the study team as the primary investigator. Other members of the team were two ED nursing directors, an ED physician, a patient representative who manages patient and family complaints and comments, a senior clinical information analyst who facilitates clinical process development to achieve quality and cost effectiveness, several project assistants who had formal roles as research assistants or secretaries, a research specialist, and a doctorate-level-trained healthcare nurse researcher. The team received input from several hospital consultants, including a medical anthropologist specializing in qualitative research methods and members of a palliative care research team who shared their experiences with a recent research study (Deitrick et al., 2005) that included an evaluation of the intensive care unit (ICU) waiting room.

The primary investigator identified evidence-based practice as a priority for the ED staff members and asked that they simultaneously be taught research principles and put them into practice. The value of this type of partnership is described by Endo et al. (2005), who found that when nurses are involved actively in a study, what they learn in the study can transform their practice in a dynamic and positive way. The primary investigator worked closely with the team nurse researcher to set up monthly activity meetings. During the first few meetings, the medical anthropologist attended and provided information and stories about the qualitative research methods that she had recommended for the project. The team members actively participated in all meetings and research activities, putting into practice the research concepts learned during the meetings. Together, the team members decided on the methods that could be used to best evaluate the waiting room environment.

At the beginning of the project, all team members received instruction on how to conduct a literature review and then completed a review on the topic of ED waiting rooms and satisfaction. Although they identified many reports about satisfaction with non-ED waiting room environments (Adams, Schmidt, Sanders, Larkin, & Knopp, 1998; Carmichael & Agre, 2002; Mowinski Jennings, Heiner, Loan, Hemman, & Swanson, 2005) or the entire ED experience (Davis & Bush, 2003; Kipp, 2001; Sun et al., 2000; Walrath, Tomallo-Bowman, & Maguire, 2004), few formal studies were found exclusively on the impact of the ED waiting room on satisfaction (Hutchison et al., 2003; Nielsen, 2004). The team decided to develop a unique questionnaire to evaluate quantitatively and qualitatively the factors that could influence patient satisfaction.

As the team members collected literature and developed the study design, they also considered the effects that other ongoing hospital initiatives would have on the study. Therefore, in addition to the traditional review of published literature, they also examined research activity at LVHNN involving the ED and identified two (unpublished) studies, the Growing Organizational Capacity and the ED Touch-Time Study.

Preliminary Study 1: Growing Organizational Capacity

In 2003, senior management initiated a major hospital-wide process improvement project: Growing Organizational Capacity, with goals to improve patient throughput within the ED from admission to discharge. Seventeen subprojects were launched over a 2-year period; several projects directly affected the ED. These subprojects included the following: (a) implementation of an electronic Bed Board to track the status of admission beds; (b) designation of patient flow coordinators (registered nurses) who facilitate patient flow throughout the network; (c) implementation of a system, aptly named the PULL system, to initiate production or service in anticipation of demand (e.g., on a nursing unit, registered nurses automatically anticipate that they will be getting a new admission when a patient is discharged, and discharging a patient initiates automatic processes to *pull* a new patient into the vacated bed); (d) establishment of the ED Patient Satisfaction Improvement Council to improve ED patient satisfaction; (e) implementation of the zero-tolerance-for-rudeness policy, consisting of mandatory staff training sessions focusing on courtesy, competency, and efficiency in the ED; and (f) development of the ED-callback program, in which ED staff contact discharged ED patients and asked for input about their recent visit.

Preliminary Study 2: The ED Touch-Time Study

Simultaneously, a multidisciplinary team (including the study primary investigator) conducted a touch-time study to evaluate the length of wait time for each patient in the ED. Wait time and perception of wait time are highly associated with satisfaction in ED patients and their families (Davis & Bush, 2003; Mowen, Licata, & McPhail, 1993), and decreasing wait time can improve satisfaction (Howell, Bessman, & Rubin, 2004; Nieslen, 2004; Spaite et al., 2002). Study team members observed patients from the time they entered the ED until they were first seen by a physician or physician's assistant to provide recommendations on the support factors needed to improve ED services for patients. The study team further identified that there were many opportunities for improvement in the ED waiting room, such as availability of magazines, more comfortable furniture, directions to the cafeteria, and improved communication between hospital staff and waiting family members, since patients and their family often spend significant amounts of time there.

Research Question for the Main Study

With continued consideration of the above studies, the team carefully looked at the overall ED environment and all the factors that could influence ED waiting room satisfaction. Patient and family satisfaction has always

been a high priority at LVHNN, and the study team knew from patient and family feedback that the ED was a critical point of first impressions and an important factor in overall satisfaction with the hospital. They knew that LVHNN's situation was not unique because this link between ED overcrowding and decreased patient satisfaction has been reported by many other hospitals throughout the nation (Derlet & Richards, 2002; Gantt, 2004; Hutchison et al., 2003; Liu, Hobgood, & Brice, 2003).

As a result, a group of multidisciplinary healthcare professionals at LVHNN identified a research question: "How can we define and improve emergency department (ED) waiting room-specific factors that are associated with low patient satisfaction?" and designed a team-based approach to address the question. There were two objectives: (a) to develop a process to support organizational and staff development while conducting research and (b) to conduct a research study in the ED to examine patient population, satisfaction, and waiting room issues.

Methods

A descriptive, cross-sectional, pre-poststudy design using mixed methods was used to identify waiting room dissatisfiers, patient and family characteristics, and waiting room improvement strategies. Only the preintervention methods and baseline results are reported here. An overview of all study activities are listed in Table 1.

Evaluation of the Waiting Room Structure

The team began by looking at the structure of the waiting room—a large rectangular-shaped room with 45 chairs that are individually placed, grouped by twos or threes or connected in rows of seven to eight chairs. Beside each chair grouping were small tables and magazine racks. There were also two reclining chairs, assorted small tables, a children's activity table, and a child-sized sofa and chair. There were two televisions, one for adults, which was tuned primarily to the news channel, and a second one for children, where they could also play videos. There was a large main entrance in front of the reception desk; a walkway through the back of the waiting room, which went by the ED restrooms and pay phones to the main hospital; an opening behind the receptionist desk, which led to the triage room on one side and the nurse's station on the other; a door to the security office; and two doors to the ED clinical area. The study team members also took photographs of all sections of the waiting room to evaluate lighting, decor, and furniture layout, mapped the area, and recorded patient type (e.g., adult, child, handicapped in wheelchair) to evaluate the potential issues related to seating arrangement during the observation phase of this project.

Survey

The team used collaborative research methods (Doherty, 2002) to develop the survey. Using collaboration builds on the cooperative learning style, acknowledging values and noting the contributions and abilities of individual group members. Doherty (2002) described how collaborative, action-orientated research is one of the best ways to develop research hypotheses and research questions that are

TABLE 1. Summary of Cooperative Learning Research Activities Performed During the Study

Questionnaire Development	Observation Process	Other
Review literature	Review literature and ICU waiting room report	Photograph waiting room environment
Discuss questionnaire development study methods	Define and discuss qualitative study methods—observation of waiting room, diagram of waiting room environment, pictures of waiting room	Talk to staff and volunteers about their perceptions of patient and family dissatisfiers with the ED waiting room
Review previous focus group data	Observe waiting room environment	Identify other processes (new and previously instituted) that could impact patient satisfaction in the ED waiting room
Develop draft survey	Record observations	Develop timeline of activities
Pilot draft survey	Transcribe observations	
Refine draft survey	Define observation themes	
Final survey given	Code and analyze observation data	
Compile and analyze survey data	Define interventions	
Define interventions		

Note. ICU = intensive care unit; ED = emergency department.

contextually sensitive and that address the true problems of practitioners and participants.

First, the team developed a draft survey using statements that took into account the dissatisfiers revealed in previous ED studies. As a starting point, they used the hospital's ICU team's questionnaire from the Promoting Palliative Care Excellence project grant (Deitrick et al., 2005), which was already validated. The study team wanted the questionnaire to be anonymous and placed in a locked box to protect patient identity and engender honest answers. The group then pilot tested the anonymous draft questionnaire with a small group of patients and their families ($n = 38$). Nurses and other ED staff were asked also to evaluate and rate the appropriateness of each question and to suggest additional questions. Face and content validity was established. The team reviewed the pilot questionnaire data and refined the questionnaire, based on pilot results. The final questionnaire consisted of 14 Likert-scale questions and 7 open-ended questions about the waiting room environment, including questions about atmosphere, telephones, staff presence, thoroughfare, professional behavior, food, triage, child-specific issues, confidentiality, and parking. Additional information provided by the authors expanding this article is on the Editor's Website at <http://www.nursing-research-editor.com>. Only demographics such as age group and gender were asked to maintain patient confidentiality.

The team engaged triage nurses to distribute surveys to ED patients. The triage nurses were asked to write the patient's triage level on the questionnaire and gave it to the patient after the initial intake session, with instructions for the patient or the patient's family to complete it in the waiting room. A five-level triage system, the Emergency Severity Index (ESI), is used in this ED, which categorizes patients based on acuity and resource need; the team felt that it was an important demographic that might be

explored further during the analysis phase (Tanabe, Gimbel, Yarnold, & Adams, 2004). Triage staff members assured patients and families that all comments were strictly confidential and were to be placed in a locked box at the volunteer's desk. Nurses made a tick mark on a flow sheet for each survey given. The final anonymous questionnaire was given randomly over a 2-week period in April 2004, to capture what might be different during the different shifts, days of week, and weekends.

Observations

The team chose a 3-week observation period to encompass the 2-week time period that the surveys were given. They felt that what they observed might provide insights not captured by the questionnaire. Six observers from the group were trained by the team nurse researcher to do observations during a study session. Observers were instructed to observe the environment carefully and to record, in their own words, what they saw. The team nurse researcher developed a random observation schedule. Observations were done at randomly selected times. Observers used a scaled map of the waiting room and its furniture to document the location of individuals and objects (e.g., wheelchairs). Observers recorded the number of individuals, along with the date and time of day at the beginning and end of each observation.

Photographs of the waiting room area demonstrated that chairs needed rearranging and reupholstering, signs needed to be updated, minor repairs needed to be made, and a child-safe area needed to be created. Observation narratives and open-ended question data were typed from the handwritten forms to electronic files and then themed by the team during a study session. The themed data were then grouped by day of week, then time of day, and then by triage level to evaluate trends. Comments in each theme that expressed a critical need that could be addressed were

TABLE 2. Grouped Suboptimal Results and Planned Interventions

Theme	Suboptimal Results (seen or heard)	Action or Intervention (planned or completed)
Atmosphere	No magazines Furniture appeared dingy Child climbing on chairs, activity table broken, comment, "You need a protected area for children!"	Reading material restock system developed New and updated furniture bought Aloha playhouse donated by volunteers and IBM to provide a protected play area for children
Telephones	Frequent comments "It seems strange that with the upgrade in technology, we can't use our cell phones." "They need to get some new phone books. The ones they have are old!" "I couldn't find the phones"	Investigation of cell phone technology in progress Old phone books discarded and replaced with new Large sign indicates location of courtesy phones
Parking and thoroughfare	Visitors coming through the ED entrance to get into the main hospital via the vending machine hallway. Dr. *** walks through the ED several times (third consecutive time he has done this) More staff in scrubs use waiting room as thoroughfare	Outside access door locked New vending machines are placed in public area for house staff and visitor use Announcement made to staff and unit leaders not to use ED waiting room as a thoroughfare
Professional behavior and staff presence	Frequent observation comments "No one checking in the waiting room" "No one at front desk" "Four people waiting at desk; no one there"	Refined "Ambassador Program," designed to encourage staff and volunteers to go out of their way to make patients and families feel welcome Increased number of volunteers Added front desk position to light duty job list for the network
Security	Triage nurse or other staff had to keep getting up to let patients or families back into the clinical area of the ED Security office door closed and shades down; unsure if security person is there	Evaluating the possibility of a buzzer that nurse or volunteer can use to unlock ED access door Security has constant, visible presence in ED waiting room on all shifts
Triage and confidentiality	Patient and family unsure if the order they were seen was fair Several observations of this type of scenario: Nurse comes out for patient, calls his name (loud enough for everyone to hear) and then comments, "You were here yesterday!"	ED expansion plans include separate walking wounded and sick and dying waiting rooms Importance of patient confidentiality stressed during Ambassador Program reeducation

selected and targeted interventions were identified to address that need. For example, there were multiple observed and reported issues related to telephones. Patients reported that they could not find telephones, and observers and patients reported that phonebooks were out of date. To address this, new signs were created to identify telephones, and new phonebooks were obtained. Frustration with restrictions on using cellular phones in the waiting room was a frequent comment listed on the questionnaire, so the team shared this information with telecom to evaluate this in light of current technology. These results are grouped by theme and are listed with interventions in Table 2.

Data Analysis

Both quantitative and qualitative analysis methods were used to evaluate the baseline, or preintervention, data.

The 14 Likert-scale questions on the questionnaire were evaluated using factor analysis. Cronbach's alpha was used to estimate internal consistency. Simple frequencies with means, medians, and modes were run to visualize the distribution of data. Mann-Whitney *U* test was used to compare the nonparametric data. Data from both the open-ended questions on the questionnaire and the observation reports were transcribed and then themed and coded by the team. Qualitative statistics were done using SPSS 12.0, and qualitative data were analyzed using simple pen-and-paper coding methods.

Results

Fifty-three surveys (82%) were returned. The number of individuals in the waiting room ranged from 0 to 18 individuals (frequent ranging from 0 to 8) instead of the

TABLE 3. Waiting Room Improvement Survey Results Listed by Ascending Mean Scores

Question	n	M	SD
I was informed about delays in treatment.	40	3.18	1.17
The room is noisy (reverse scored).	51	3.25	1.20
The telephone is in a convenient location.	43	3.44	1.18
The order in which patients were seen seemed fair.	47	3.45	1.00
If needed, I was able to find locations within the hospital (e.g., cafeteria, gift shop).	37	3.54	1.12
The vending machines were adequate.	44	3.68	1.07
Reading materials were available.	50	3.70	1.13
The restrooms are clean and neat.	34	3.76	0.92
I felt I had privacy in discussing my or my family member's medical condition.	47	3.81	0.99
I was greeted on arrival.	52	3.87	1.44
The waiting room seating was comfortable.	53	3.87	1.02
The lighting is adequate.	53	4.09	0.99
The waiting room is clean and neat.	53	4.23	0.82
My or my family member's initial evaluation by the nurse was adequate.	51	4.24	0.99

Note. Scale: 1 = definitely disagree; 5 = definitely agree.

expected 20 to 30 individuals observed in the touch-time study. Wait times were much lower, also with most waits lasting less than 1 hr, and frequently only 5 to 15 min instead of greater than 1 hr as observed in the touch-time study.

Demographics were reported as frequencies, and five-point Likert-scale data were reported as box plots. Satisfaction scores (Table 3) ranged from 3.18 ($SD = 1.17$) to 4.28 ($SD = .99$). Thirty-four percent ($n = 18$) of the respondents were male; 8% ($n = 4$) did not report their gender. Of those who indicated their relationship to the patient being admitted, 42% ($n = 22$) were the patient themselves and 49% ($n = 26$) were a family member or friend. Nine percent ($n = 5$) of the respondents did not indicate their relationship to the patient. There was a normal distribution of respondents across all age groups, with the majority in the 35–59 years age group ($n = 20$). Of note, ESI scores on the 53 surveys were similar to the usual number of admissions in each score by month, with 12 (23%) at ESI 2, 17 (32%) at ESI 3, and 13 (25%) at ESI 4. When survey data were grouped by ESI score, there were no significant differences in scores between groups using the Mann–Whitney U test for comparison of nonparametric data.

Construct validity was established using factor analysis. Using factor analysis of the 14 Likert-scale questions, four factors accounted for 77% of the variance in patient or family responses to questions. The four factors were defined by the following four constructs: (a) comfort with environment, (b) neatness and cleanliness, (c) noise, and (d) personal attention. Reliability analysis was then done on these questionnaire data, with Cronbach's $\alpha = .892$ and Guttman's split-half coefficient = 0.701.

Discussion

This study demonstrated that careful planning and understanding of observational research methods are needed to evaluate an environment effectively. The initial goal was to learn about research while conducting research and then to use what was learned to change practice. Using the carefully designed observational methods needed for this study, the team members gained first-hand knowledge on how to evaluate their environment and population of interest carefully and systematically.

Furthermore, using a collaborative research model was effective. Often, healthcare research is done by researchers who are foreign to the environment they are studying. Doherty (2002) showed that action-orientated research that is collaborative in nature is a way to develop a research hypothesis that is sensitive to the environment being studied and to define research questions that truly address the problems at hand. In this study, a researcher engaged healthcare practitioners as students in the process of research to identify and evaluate problems effectively. The study team found that staff and leaders were committed to the changes to be made as a result of their pre-intervention findings because these changes were supported by data that they had collected. It appears that this can be an effective method to help clinicians and healthcare leaders understand and perform evidence-based practice.

There were several limitations to this study. The numbers of family and patients in the waiting room were lower than anticipated at the start of the study because of short wait times, and thus, some of the results related to waiting room wait times cannot be generalized. Construct validity was done on the waiting room satisfaction questionnaire, but the team had no ability to evaluate constructs against other similar questionnaires because no similar ED questionnaire or scale was being used. In addition, test-retest reliability was not done because of the nature of the population studied and the team's unwillingness to add undue burden to a group of individuals dealing with a stressful situation. Study members were not experienced research observers; thus, it is possible that they overlooked or missed some observations. However, even experienced observers may miss or misinterpret observations, and the goal of this project was for the clinician participants to have a *lived experience* of the important careful and systematic aspects necessary for research (Endo et al., 2005).

Summary

The collaborative method for teaching research is a promising method to bring research understanding to clinicians in the clinical setting. With thoughtful planning, something as simple as a monthly team meeting can be used to learn and use research methods.

Involvement of the bedside clinician in research is high on the American Nurses Credentialing Center Magnet Certification program agenda for both the impact on patient care and professional development. Hospitals seeking Magnet certification or renewal of their Magnet certification are exploring innovative ways, such as this, to engage clinicians

in research. The current focus on evidence-based practice also warrants that clinicians and researchers learn from each other to mesh research effectively with practice. ▣

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* POD refers to a grouping of beds by different geographical areas of the ED.

Corresponding author: Gina Sierzega, MA, Grants/Research Specialist, Lehigh Valley Hospital and Health Network, Suite 104b, 1247 S. Cedar Crest Blvd., Allentown, PA 18103 (e-mail: gina.sierzega@lvh.com).

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