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14. ABSTRACT

Purpose: To determine if participation in evidence-based practice (EBP) interventions designed to promote and sustain the use of fall and pressure ulcer (PU) prevention clinical practice guidelines (CPGs) improves nursing care processes or patient and nursing outcomes. **Design**: A randomized, controlled, counterbalanced design; data were obtained from nurse and patient surveys, pre-posttests, hospital incident reports, nurse observations, and inpatient electronic records. **Methods**: Four inpatient units at a military hospital were randomly assigned to receive either Evidence-Based Bedside Rounds (EBBR) followed by EBP education (EBP ED) or EBP ED followed by EBBR. **Sample**: 354 patient surveys and 339 nurses from four medical, surgical and step-down units at one Army medical center. **Analysis**: Descriptive statistics, t-tests, Chi square, change scores, and RM-ANOVA. **Findings**:

- RN & LPN PU CPG adherence increased (65% to 92%)
- PU prevalence decreased (12.5% to 3.2%)
- Nurses' perceptions of care quality and their unit's ability to respond to emergencies improved significantly (p=0.04 and p=0.05)

Implications for Military Nursing: Whether at home or in theater inpatients are at risk for falls and PUs and nurses have a role in preventing them. When consistently implemented, prevention strategies decrease the number and severity of these events. However, the unique characteristics of military nursing environments, including deployments, backfill with Reservists and contractors, and a burdened civilian workforce, can compromise patient safety. This project's interventions were developed to provide nurses with standardized tools necessary to effectively implement and sustain fall and PU prevention CPGs. Emerging evidence and patient safety principles were the foundation for the toolkit produced by the project. EBBR and EBD ED were both proven to be beneficial and the project was hailed as a great success at all levels of the participating hospital. Many project products were incorporated into CPGs under consideration by the Army Nurse Corps.

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Abstract

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Design: A randomized, controlled, counterbalanced design; data were obtained from nurse and patient surveys, pre-posttests, hospital incident reports, nurse observations, and inpatient electronic records.

Methods: Four inpatient units at a military hospital were randomly assigned to receive either Evidence-Based Bedside Rounds (EBBR) followed by EBP education (EBP ED) or EBP ED followed by EBBR.

Sample: 354 patient surveys and 339 nurses from four medical, surgical and step-down units at one Army medical center.

Analysis: Descriptive statistics, t-tests, Chi square, change scores, and RM-ANOVA

Findings:

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TSNRP Research Priorities that Study or Project Addresses

Primary Priority

Force Health Protection:	☐ Fit and ready force ☐ Deploy with and care for the warrior ☐ Care for all entrusted to our care
Nursing Competencies and Practice:	☐ Patient outcomes ☐ Quality and safety ☒ Translate research into practice/evidence-based practice ☐ Clinical excellence ☐ Knowledge management ☐ Education and training
Leadership, Ethics, and Mentoring:	☐ Health policy ☐ Recruitment and retention ☐ Preparing tomorrow's leaders ☐ Care of the caregiver
	☐

Secondary Priority

Force Health Protection:	☐ Fit and ready force ☐ Deploy with and care for the warrior ☐ Care for all entrusted to our care
Nursing Competencies and Practice:	☐ Patient outcomes ☒ Quality and safety ☐ Translate research into practice/evidence-based practice ☐ Clinical excellence ☐ Knowledge management ☐ Education and training
Leadership, Ethics, and Mentoring:	☐ Health policy ☐ Recruitment and retention ☐ Preparing tomorrow's leaders ☐ Care of the caregiver
Other:	☐

Progress Towards Achievement of Specific Aims of the Study or Project

The project addressed three specific aims:

Specific Aim 1. Introduce and evaluate **evidence-based bedside rounds (EBBR)** as an intervention to implement and sustain use of recently updated evidence-based clinical practice guidelines that focus on two Joint Commission Patient Safety Goals for 2009, 1) Goal 9: Reduce the risk of patient harm resulting from falls and 2) Goal 14: Prevent healthcare associated pressure ulcers (decubitus ulcers) [1].

Evidence-Based Bedside Rounds (EBBR) were defined as rounds performed by a licensed nurse at least once every two hours during the entire-24 hour period [2] while using rounding behaviors from the Evidence-Based Bedside Rounds Checklist (Figure 1). Sleeping patients were not awakened unless it was deemed necessary for treatment.

Figure 1: Evidence-Based Bedside Rounds Checklist

Evidence-Based Bedside Rounds (EBBR) Checklist **Conducted at least once every 2 hours** The following activities will be performed for each patient. • Upon entering the room, tell the patient your name and title and that you are there to do bedside rounds. • During the evaluation, also assess the patient's mental status including location/orientation to detect any changes in their condition. ✎ *Remember to document these interventions.*	
1	Ensure patient's ID band is on and verify the patient's identity by name and date of birth.
2	Perform quick environmental assessment to look for hazards/obstacles such as lines, tubing, electrical cords, or personal items that could contribute to patient falls.
3	Put the bedside table next to the bed; ensure call light, telephone, water, tissue, and garbage can are within the patient's reach.
4✎	Assess patient pain levels using a pain assessment scale. Plan for prn medications in advance and provide immediate relief for pain so the patient does not have to use the call light.
5	Offer toileting assistance. If declined, inform patient you will return within the next 1-2 hours to offer assistance again. Remind patients at risk for falls to call for assistance when getting out of bed and keep walking aids nearby.
6✎	Assess the patient's position and position comfort. If patient has impaired mobility re-position q2h. Offer to assist patient to get out of bed, if ordered.
7✎	When assisting with repositioning, perform skin assessment. Look for reddened areas, moisture from incontinence, excoriation from body fluids, dressings that need changing, or overly dry skin needing lotion.

8	Ensure head of bed ≤ 30° and heels are off the bed.
9	Ensure bed is in low position, assess alarm mechanisms to see if functional and activated, encourage patient to exit bed on stronger side, use side rails as assistive, not restrictive devices, and verify that the visual cue of falls risk (Falling Star) is in the room.
10	Use this opportunity to educate patient about preventing falls and pressure ulcers and answer questions about their nursing care.
11	Prior to leaving the room, ask, "Is there anything I can do for you before I leave? I have time while I am here in your room."
12	Tell the patient that a member of the nursing staff will be back in the room making bedside rounds within the next 2 hours.

The introduction of EBBR was accomplished with the development of a structured rounding education program to include nurse and patient focused tools. Individual and organization level preparation and implementation strategies were identified and employed using innovative strategies identified by Melnyk [3] and Titler [4]. Planning and implementation of organization level sustainment strategies were based on Rogers' Diffusion of Innovations theory [5].

Individual Level Implementation Strategies

Prior to the introduction of the program, Department of Nursing leadership support for implementation of EBBR training was established. Clinical Nurse Officers in Charge (CNOICs) from each nursing unit made recommendations for scheduling of pre-training and initial training to optimally reach 100% of staff**.** Training was offered on all shifts, at change of shift, and in combination with scheduled mandatory unit meetings.

In order to achieve 100% staff education and competency, it was necessary to extend the education period from 4 weeks to 8 weeks in length. This allowed for multiple offerings at various times and locations while supporting the staffing needs of the nursing care unit. This adjustment extended the timeline by one month. Group 1EBBR training began 27 January 2010 with 100% staff competency achieved by 24 February 2010. Group 2 EBBR training began 19 May 2010 with 100% staff competency achieved by 30 June 2010. Table 1 illustrates the project design.

Table 1. Detailed Design Description

		Study Periods				
		Period 1		Period 2		Period 3
Group 1	R	B	EBBR	M	EBP ED	M
Group 2	R	B	EBP ED	M	EBBR	M

R = Randomize units to treatment groups
B = Collect all baseline measures
EBBR = Implement Evidence-Based Bedside Rounds
EBP ED = Implement standardized EBP Education
M = Measure all process and outcomes variables

Organization Level Implementation Strategies

Key evidence-based assessments and interventions directed at reducing risk for falls and pressure ulcers were identified in the organization's evidence-based clinical practice guidelines (CPG) and inserted into the EBBR checklist. As the CPGs had already been approved by all levels and types of hospital care providers, this strategy ensured that many components of EBBR were readily adopted into the existing culture. The project was supported by the Deputy Commander for Nursing, Section Chiefs, and CNOICs of participating nursing units. Project leaders represented all of the units involved in the project. Staff and nursing leaders from units performing EBBR were given frequent updates about staff competency rates. Once the unit reached a 100% competency rate, the nurses were recognized for their accomplishment through presentation of certificates, badge star stickers, and announcements at unit staff meetings.

Training

Pre-training information describing EBBR training was communicated to staff by the project director (PD) during shift change huddles on all participating units. Eligible participants included all staff assigned to the unit: Registered Nurses (RNs), Licensed Practical Nurses (LPNs), Medics, and Certified Nursing Assistants (CNAs). Pre-training included an overview of upcoming EBBR training, the training schedule, and team expectations. Training information was retained on the unit by using an information board which included the background of EBBR, the EBBR checklist, and timelines.

Initial Training was conducted in small groups (8-20 participants) by the PD (Table 2). Again, participants included all staff assigned to the unit: RNs, LPNs, Medics and CNAs. During training, the PD explained the purpose of EBBR, familiarized staff with the EBBR checklist, demonstrated the actions to be performed during rounding and reviewed documentation expectations. Each participant was given an EBBR checklist with descriptions of project activities and a smaller badge card checklist. Staff was encouraged to use the EBBR checklist for all rounds and to begin performing EBBR immediately. Rounding posters containing visual and verbal cues of the 12 rounding steps were posted on each patient door. A patient information letter was available for nurses to provide education to patients about rounding. Electronic documentation was enhanced by an Essentris template specific to rounding behavior. Nurses initiated a New Admission Order Set which included specific rounding behaviors and fall and pressure ulcer prevention interventions appropriate to all patients regardless of level of risk. Members of the study team were available on the unit after the training and provided individual support and coaching for staff as they performed their first few episodes of rounding.

Follow-up training and competency evaluations using one-on-one competency checks guided by the EBBR 12-step checklist, as well as documentation reviews, were completed within 2 weeks of initial EBBR training. Competency certificates and visual completion identifiers (badge stars) were issued to staff members once they were deemed proficient in all aspects of EBBR competencies. After one month, EBBR competency and adherence were reevaluated for each staff nurse by a project team member through one-on-one discussion and/or observation. Project team members utilized the 12-step checklist and documentation review which had already been integrated as a unit standard. Staff nurses were given an opportunity to discuss individual EBBR integration successes and challenges. Those not meeting competency requirements received individualized retraining and reassessment. Verbal praise was offered for effort and commitment, and strategies to address perceived challenges were discussed. Project team members attended unit huddles monthly, shared EBBR updates and addressed frequently asked questions with staff nurses. Ongoing unit training occurred through a variety of modalities including monthly huddles, unit level inservices, information posters, and newsletter articles. New staff on the EBBR units received education by a project team member during their orientation and assessment as previously described.

At the completion of Period 3 training, the EBBR training was added to unit level new employee orientation activities. EBBR behaviors and documentation were adopted as part of the mandatory unit level competency requirement for all staff nurses. EBBR documentation and initiation of the EBBR order set (New Admission Order Set) were integrated into unit level documentation audits. Along with project team members, unit preceptors and nurse champions reinforced competency and adherence to the new EBBR behaviors.

Table 2. EBBR Nursing Personnel Training

	Group 1 No. (%)		**Group 2 No. (%)**		**All Groups No. (%)**
	Period 2	**Ongoing**	**Period 3**	**Ongoing**	**All Periods**
Training Sessions Offered	25		21		46
Military Nursing Personnel Eligible for Training (%)	50 (100%)	15 (100%)	39 (100%)	10 (100%)	114 (100%)
Military Nursing Personnel Completing Competency Check (%)	50 (100%)	15 (100%)	37* (95%)	10 (100%)	112* (98%)
Civilian Nursing Personnel Eligible for Training (%)	49 (100%)	5 (100%)	76 (100%)	10 (100%)	140 (100%)
Civilian Nursing Personnel Completing Competency Check (%)	49 (100%)	4* (80%)	73* (96%)	10 (100%)	136* (97%)
Total Nursing Personnel Trained	119		135		254

*Some nurses transferred from participating unit prior to competency check

Nurse Observations to Ensure EBBR Adherence

Each month during measurement periods 2 and 3, four shifts were randomly selected for staff observation in order to determine if and to what extent nurses were performing EBBR. Informed consent was a requirement for participation in EBBR observations. The voluntary consent contained information related to this evidence-based practice project such as purpose, observation procedures, role of the observer, risks and inconveniences associated with observations, and alternatives to participation. Licensed nurses assigned to direct patient care were given an opportunity to volunteer once they had completed competency for EBBR. The PD obtained written consent when the individual nurse competency certificate was verified and throughout the project period. At the time of consent, the PD reviewed the consent form and answered questions specific to the observations. The nurse was given the opportunity to review and sign the consent form, take the consent for further review, or decline participation. The PD followed up with nurses who requested additional time to consider participation. At each approach, the nursing staff was reminded that participation was voluntary. Nurses who verbally declined to participate were not re-approached at a later time for observations. Signed consent documents were kept in a locked file throughout the project.

On the selected days, one licensed nurse assigned to direct patient care was randomly selected for observation. At the time of EBBR observations, the PD randomly selected a nurse providing direct patient care with consent on file. The nurse was asked to participate in rounding observation and arrangements were made to “shadow” the nurse when EBBR was performed during patient care. During the observation, the observer used an EBBR observation checklist to note whether the nurse performed all rounding behaviors (Figure 2). One-on-one feedback was given after each observation to allow for positive reinforcement and process improvements as needed. The EBBR observation checklist was completed to include observations, unit, date,

time and people involved (RN, LPN, patients, spouses etc). Patient identifiers were not recorded on the observation form.

Figure 2: EBBR Observation & Competency Checklist

Evidence-Based Bedside Rounds (EBBR)	CPG Adherence Observed		
a. Pt/family introductions are made	**YES**	**NO**	
b. Pt id band check	**YES**	**NO**	
c. Room assessed for hazards/obstacles such as trash can, cords, tubing & personal items.	**YES**	**NO**	
d. Ensures the following items are within reach of the patient:	**YES**	**NO**	
Bedside table with water pitcher (if appropriate)	**YES**	**NO**	
Call light	**YES**	**NO**	
Tissues	**YES**	**NO**	
Trash can	**YES**	**NO**	
Phone	**YES**	**NO**	**NA**
Personal items: assistive devices/eyeglasses			
e. Patient assessed for comfort/pain	**YES**	**NO**	
If in pain:			
Pain relief measures initiated	**YES**	**NO**	**NA**
f. *If pt identified at risk* for falls (Morse score ≥ 45), the following are in place:	**Score**_____		
	History		_____
	2nd Diagnosis		_____
	Ambulatory Aid		_____
	IV/IV access		_____
	Gait		_____
	Mental Status		_____
Falling star symbol on door	**YES**	**NO**	
Yellow id band	**YES**	**NO**	
Yellow non-skid socks	**YES**	**NO**	
Bed maintained in low position or Low Bed in place	**YES**	**NO**	
g. EBBR occur within 2 hours of previous rounds	**YES**	**NO**	
h. If applicable, toileting offered during EBBR q2h **OR** if bed-bound, patient was checked for incontinence	**YES**	**NO**	**NA**
i. If applicable, patient reminded to call for assistance if unable to get up without assistance or is at risk for falling	**YES**	**NO**	**NA**
j. If applicable, patient at risk for skin breakdown (≤ 18 on Braden or immobile), the following are in place:	**Score**_____		
	Sensory		_____
	Moisture		_____
	Activity		_____
	Mobility		_____
	Nutrition		_____
	Friction		_____
Patient with mobility impairment is repositioned q2h	**YES**	**NO**	**NA**
Heels elevated	**YES**	**NO**	**NA**
Head of bed at or below 30 degrees	**YES**	**NO**	**NA**

k. Answers questions/educates patient about preventing falls and pressure ulcers	**YES**	**NO**
l. Asked if there is anything more I can do?	**YES**	**NO**
m. Communicates when nursing team member will return	**YES**	**NO**

One hundred and forty two nurses consented for EBBR adherence observations, representing 70% of licensed staff on study units during observation periods (Table 3).

Table 3: Licensed Nurses Consented for EBBR Observations

	Group 1 No. (%)	**Group 2 No. (%)**	**All Groups/Periods No. (%)**
Military Eligible	49	44	93
Military Consented (%)	34 (70%)	30 (68%)	64 (69%)
Military Declined	5	8	13
Military Lost to F/U	10	6	16
Civilian Eligible	44	67	111
Civilian Consented (%)	32 (73%)	46 (69%)	78 (70%)
Civilian Declined	9	11	20
Civilian Lost to F/U	3	10	13
Total Eligible	93	111	204
Total Consented/Total Eligible (%)	66 (71%)	76 (68%)	142 (70%)

Findings from Nurse Observations to Ensure EBBR Adherence

Group 1 EBBR adherence data were gathered in Period 2 from February 2010 to April 2010. Twelve observations per unit for a total of 24 observations were performed during Period 2. All aspects of rounding behavior were found to be completed with 100% adherence, with the exception of the following items: trash can within reach (92%), heels elevated from bed (75%), HOB≤ 30 degrees (92%), and EBBR documentation (92%). Feedback was given with each observation and, if applicable, deficiencies were corrected by the nurse following observation.

In Period 3, Groups 1 and 2 EBBR adherence data were gathered following completion of Group 2 training and achievement of competency. Each month from July 2010 to September 2010, four shifts were randomly selected for staff observation. As described previously, one nurse from the licensed nursing staff working was randomly selected for EBBR observation. Twelve observations per unit, totaling 24 observations per group, with a total of 48 observations were performed during Period 3.

Group 1 had completed initial EBBR training 5 months prior. Data collected from Group 1 observations showed that rounding behaviors were completed with 100% adherence with the exception of the following items: phone in reach (96% , a 4% improvement), heels elevated from bed (96%, a 21% improvement), and HOB≤ 30 degrees (96%, a 4% improvement). EBBR documentation, which was 92% in period 2, was noted to be 100% in period 3. Feedback to correct any deficiencies was given following each observation.

Group 2 had recently completed EBBR training. Data collected from Group 2 showed that rounding behaviors were completed with 100% adherence with the exception of the following items: trash can within reach (92%, a 4% improvement), tissue within reach (88%, a 21% improvement) and answers questions/educates about preventing falls (88%, a 4% improvement). Feedback to correct any deficiencies was given following each observation.

Group 1's improvement in scores over time was attributed to feedback, continued unit level expectations, familiarity, and adoption into daily practice. In Period 3, Group 2 was new to

rounding with implementation occurring 1-3 months prior to observations. The adherence rate was noticeably less than the threshold of 100% on 3 observation measures. It is likely that with additional time performing EBBR, rates would improve as seen in Group 1.

Organization Level Sustainment Strategies

Clinical Practice Guidelines (CPGs) are evidence-based practice guidelines developed by clinical experts and endorsed and disseminated within the organization by the Deputy Commander for Nursing. In conjunction with this EBP project, CPGs were developed, disseminated, and adopted regarding Fall Prevention and Skin Breakdown Prevention. This project brought an increased emphasis to nursing-sensitive quality indicator monitoring through falls metric data collection and pressure ulcer prevalence studies. Six months after initial EBBR training had begun, EBBR training and competencies were added to the participating units' orientation and provided for all incoming staff members as part of their orientation checklist. EBBR behaviors and documentation competencies were adopted as part of the mandatory unit level competency requirement for all staff nurses. A standardized competency based orientation form (CBO) for initial and ongoing competencies was developed for EBBR and has been adopted as part of mandatory annual nursing competency assessment for participating units. EBBR documentation and initiation of EBBR order set (New Admission Order Set) were integrated into unit level documentation audits.

Specific Aim 2. Provide **structured EBP education** focusing on translation of research into practice for all nurses involved in this initiative to include clinicians, managers, and leaders in the medical, surgical, and progressive care environments. In addition, provide EBP education targeting fall and pressure ulcer prevention CPGs.

Standardized Evidence-Based Practice Education (EBP ED) was defined as formal, structured lessons in EBP to include an overview of concepts, as well as various models, and methods to incorporate its components into bedside care. Individual and organization level preparation and implementation strategies were identified and employed using innovative strategies, identified by Melnyk [3] and Titler [4]. Planning and implementation of organization level sustainment strategies were based on Rogers' Diffusion of Innovations [5].

For this project, EBP ED combined components of an EBP continuing education course purchased from the Research, Quality and Outcomes Management, Department of Nursing Services and Patient Care at the University of Iowa Hospital and Clinics. The project team developed instructions regarding development and content of evidence-based Fall Prevention and Skin Breakdown Prevention CPGs.

The project team finalized the content of the EBP ED course after attending the Advanced Practice Institute: Promoting Adoption of Evidence-Based Practice and utilizing the expert consultation time included with the course. In evaluating the original online Iowa EBP course, barriers to successful implementation were identified. The course included 4 separate modules with pre and post knowledge testing. Each module and associated test was intended to be completed in one sitting. Approximately 45 - 60 minutes was required to complete each module. If training was paused, answers from pre and posttests would not be saved, preventing users from returning to their training at a later time. Unit-based computer access to accommodate training was limited on the participating nursing care units, requiring a need to identify and secure off-unit computer access. Since many of the staff participants reported having minimal EBP training, concerns regarding the inability to offer face-to-face facilitation during the training were identified. CNOICs from each nursing unit made recommendations for scheduling of face-to-face training to optimally reach 100% of staff**.** The recommendations included offering the training on all shifts, limiting training to a 2-hour block, and delivering training on the nursing care unit, preferably in unit classrooms.

As a result of our evaluation, a group of EBP training experts was formed to modify the Evidence-Based Practice Course. The course was condensed into a 2-hour time period, allowing for a unit-based, facilitated, face-to-face presentation. The course utilized a PowerPoint slide presentation, CPG review, and pre/post testing. The core outline of the original course was retained and a single pre and posttest was developed based on the material. The resulting structured education program included the following and is further described in Figure 3:

- Overview of EBP
- Conceptual models used for EBP
- Review of CPG development for falls and pressure ulcer prevention
- Implementation of these CPGs
- EBP and CPG responsibilities of each level of care provider
- Benefits to patients and staff when using EBP to guide bedside nursing care

Figure 3: EBP ED Training Outline

1. History of Evidence-Based Practice in Nursing
2. Definition of Evidence-Based Practice
    a. Differentiate research utilization and evidence-based practice
3. Relevance of Evidence-Based Practice
4. Models of Evidence-Based Practice
    a. Multiple Models
    b. Specific Model: Iowa Model
        (1) Individual and Organizational Perspective
        (2) Lead Nursing Roles
            (a) Change Champions
            (b) Core Groups
5. Key Steps of Evidence-Based Practice Approach
    a. Topic: Priority
    b. Form a Team
    c. Assemble Literature
    d. Critique and Grade Literature
    e. Develop Recommendations
    f. Implement Change
    g. Evaluate Change
6. Development of Evidence-Based CPGs
7. Review of Evidence-Based CPGs
    a. Fall Prevention
        (1) Review
        (2) Roles and Responsibilities
        (3) Risk Assessment and Documentation
        (4) Significant Risk Interventions
    b. Skin Breakdown Prevention
        (1) Review
        (2) Roles and Responsibilities
        (3) Risk Assessment and Documentation
        (4) Significant Risk Interventions

Training schedules were developed to offer multiple opportunities for attendance during each week. Training was located in nearby unit classrooms/break rooms. Classes were offered during times that accommodated the work hours of staff in need of training and allowed for nursing coverage of patient care. Meeting the two-hour training goal was accomplished by requiring staff to complete the pretest prior to attending the course. Rotation of staff to the training was facilitated by the CNOIC and charge nurse on each unit. In order to accomplish 100% staff education, it was necessary to extend the education period from 4 weeks to 8 weeks in length. This adjustment extended the project timeline by one month.

Implementation of EBP ED training for Group 2 began 07 December 2009 with 100% staff completion by 4 February 2010. Group 1 began EBP ED training 10 May 2010 with 100% staff completion by 30 June 2010.

Individual Level Implementation Strategies

Prior to implementation, Department of Nursing leadership support for the EBP ED training was established. All RNs and LPNs on participating units were given duty time to complete the EBP course.

Organization Level Implementation Strategies

EBP education of this type and caliber had never been offered at the medical center because the education budget could not support the cost of training a large number of nurses at one time. Providing excellent EBP training to all RNs and LPNs at no cost to Madigan Army Medical Center was viewed by the organization as value-added to participating in the project. Training generated many new opinion leaders and change champions for this project as well as other EBP projects. At the completion of Period 3 training, EBP training was added to new employee orientation and other Madigan nursing courses.

Training Pre and Posttests

Tests were developed that measured project knowledge uptake variables. Pre and posttests were used to measure the project process variables: CPG-specific knowledge uptake and EBP-specific knowledge uptake. Testing was given in a paper format since computer access was not available. Participants (n=213) were given these tests to determine their level of knowledge related to the following educational objectives and outcome goals (Table 4):

- Introduce the Iowa Model of EBP to Promote Quality Care [4] in order to increase their understanding of CPG development and the use of evidence to improve practice
- Provide information from The Joint Commission and the National Quality Forum to demonstrate why patient outcomes were a priority for the organization
- Explain the literature critique and research synthesis processes and have relevant articles available for review during the training
- Explored the process used to determine if the research base was sufficient enough to support the CPGs
- Discuss barriers and motivators that may have impacted nurses' ability to implement the CPGs and propose solutions

Staff members were given CEUs and a certificate following completion of EBP training. New staff to units that were receiving EBP ED received education by a project member during their orientation. Throughout Period 3, EBP education was continued at new employee orientation for nursing staff on units that participated in this EBP project.

Table 4: Licensed Nurse EBP ED/Fall and Skin Breakdown Prevention CPG Training

	Group 1 No. (%)	Group 2 No. (%)	All Groups No. (%)
Training Sessions Offered	19	31	50
Licensed Nursing Personnel Trained	97	116	210
Total Licensed Nurses Assigned to Group Trained	97 (100%)	116 (100%)	213 (100%)

Fall and Pressure Ulcer Prevention CPG Adherence (Record review)

Project team members utilized documentation review to evaluate adherence to Fall Prevention and Skin Breakdown Prevention CPGs. Electronic inpatient records were examined to determine adherence to CPGs as indicated by nursing documentation of assessment, prevention, management, and treatment. Adherence was defined as the percent of appropriate CPG components implemented for a particular patient. A checklist was utilized by project team members to evaluate patient records (Figure 4).

Figure 4. Chart Adherence Checklist

Documentation: Period 2/3	CPG Adherence		
a. Fall risk assessment using the Morse Fall Scale completed	**Score**_____		
1) Within 4 hours of admission	**YES**	**NO**	
2) This shift	**YES**	**NO**	
3) *If applicable*, Upon change in condition	**YES**	**NO**	**NA**
4) *If applicable*, Upon transfer from other unit/facility	**YES**	**NO**	**NA**
b. *If patient Morse ≥ 45,* Nursing Initiated Orders (NIO) for Fall Prevention are in Essentris	**YES**	**NO**	**NA**
c. *If applicable, Patient at risk for falls* is identified during shift report and prevention strategies described/discussed as part of handoff communication	**YES**	**NO**	**NA**
d. *If fall occurs*, event reported using MAMC Form 1698-QSD within 24 hours	**YES**	**NO**	**NA**
e. Skin breakdown assessment using the Braden Scale completed	**Score**_____		
1) Within 4 hours of admission	**YES**	**NO**	
2) This shift	**YES**	**NO**	
3) *If applicable*, With any change in condition placing pt at increased risk (e.g. impaired mobility, sensation, nutrition, moisture)	**YES**	**NO**	**NA**
f. Skin inspection documented daily on shift assessment in Essentris			
1) Within 4 hours of admission	**YES**	**NO**	
2) This shift	**YES**	**NO**	
3) *If skin breakdown noted*, description of location and specifics of wound documented	**YES**	**NO**	**NA**
4) *If applicable*, Pressure ulcer assessment documented in transfer note and receiving nurse notified	**YES**	**NO**	**NA**
g. *If Braden score ≤ 18*, Nursing initiated orders (NIO) for Skin Breakdown Prevention are in Essentris	**YES**	**NO**	**NA**
h. *If patient utilizing* specialty bed, bed is appropriate for	**YES**	**NO**	**NA**

patient per specialty bed algorithm.			
i. *If applicable,* Healthcare-associated pressure ulcer reported using MAMC Form 1698	**YES**	**NO**	**NA**
j. *If applicable,* Wound nurse consulted if pressure ulcer > Stage II	**YES**	**NO**	**NA**
l. *If applicable,* patient is being discharged the nurse provides written instructions regarding care of pressure ulcers.	**YES**	**NO**	**NA**
Period 2 (Group 1 only) and Period 3 (Group 1 & 2):			
NIO: Admit order set (includes nurse rounding and nurse admit orders)	**YES**	**NO**	**NA**
Rounding documentation on Vitals Screen	**YES**	**NO**	**NA**

Morse		**Braden**	
History	____	Sensory	____
Secondary	____	Moisture	____
Ambulatory	____	Activity	____
IV	____	Mobility	____
Gait	____	Nutrition	____
Mental status	____	Friction	____

Each month during data collection periods, four shifts were randomly selected for documentation review. On selected days, one patient record was randomly selected for review from each participating nursing care unit. To be eligible for review, the patient chart must have been initiated for an admission at least 24 hours prior to the review shift. The admission and shift documentation time period had to occur on the same nursing unit being evaluated. If a chart was selected but did not meet these criteria, an alternate chart was selected.

Specific Aim 3. This aim was added to the project July 2010 to provide a mechanism for implementation, evaluation, and sustainment of evidence-based falls and pressure ulcer prevention interventions for Medical, Surgical and Step-Down nursing units. An exportable **EBP Falls and Skin Breakdown Prevention Toolkit** was developed to assist nurses practicing at Army military treatment facilities (MTFs) in meeting the requirement of implementation, evaluation, and sustainment of EBBR and EBP ED as part of a patient-centered Skin Breakdown and Fall Prevention program (Figure 5).

This aim was accomplished with the development of a structured, exportable evidence-based Fall Prevention and Skin Breakdown Prevention Toolkit. The toolkit offers adaptable tools for implementation, evaluation, and sustainment of an evidence-based practice nursing program that can be individualized to Army MTFs. The electronic format of this toolkit allows accessibility and flexibility for use. The EBP Fall and Skin Breakdown Prevention Toolkit will be submitted as part of this final report. TSNRP will own the toolkit and manage its availability.

Figure 5. Skin Breakdown and Fall Prevention Toolkit Contents

1. **Skin Breakdown Prevention**
   a. Education: Skin Breakdown Prevention Patient Care Procedure (PCP)
   b. Pre and Posttests for Skin Breakdown Prevention PCP
   c. Pressure Ulcer Prevalence Survey Toolkit
   d. Skin Breakdown Prevention Order Set

2. Fall Prevention
   a. Education: Fall Prevention Clinical Practice Guideline (CPG)
   b. Pre and Posttests for Fall Prevention CPG
   c. Fall Prevention Order Set

3. Evidence-based Patient-Centered Rounding
   a. Education: Patient-Centered Bedside Rounding CPG
   b. Evidence-based Practice and Rounding CPG Training Slides
   c. Rounding Checklist (can be used by preceptors or for self assessment)
   d. Additional Rounding Products
      1. Staff Badge Card for Rounding Reminders
      2. Rounding Checklist Poster
      3. Rounding Competency Based Orientation Checklist
      4. Rounding Competency Certificate
      5. Patient Education Brochure
      6. New Admission Order Set (includes standard rounding/fall prevention and skin breakdown prevention interventions)

Findings related to each specific aim, research or study questions, and/or hypothesis

Specific Aim 1: Introduction and evaluation of EBBR was explained previously in the progress section (p. 5).

Specific Aim 2: The provision of structured EBP ED was explained previously in the progress section (p. 11).

Specific Aim 3: The development of an exportable toolkit was explained previously in the progress section (p. 15).

Overview of Analysis Techniques

Unless otherwise specified, statistical techniques used for analysis included RM-ANOVA when comparing groups across the three project time periods, and t-tests when evaluating the impact of combined EBBR and EBP ED (period 1 versus period 3) or knowledge uptake pre and posttests. The analysis also includes descriptive statistics and calculation of change scores. When patient and nurse satisfaction scores had positive skewness, logarithmic transformation and inverse transformation were employed but did not resolve the skewness. These data were then dichotomized (not satisfied or satisfied) and evaluated using chi square.

Research Question - Does participation in innovative evidence-based interventions to promote and sustain utilization of evidence-based fall and pressure ulcer prevention clinical practice guidelines improve nursing care processes, patient outcomes and nursing outcomes?

1. Nursing care processes include adherence to the fall prevention CPG and adherence to the skin breakdown prevention CPG.
2. Patient outcomes include fall rates, fall with injury rates, pressure ulcer prevalence, healthcare associated pressure ulcer prevalence, and patient satisfaction with nursing care.
3. Nursing outcomes include nursing staff perception of patient care quality, nursing staff effectiveness, nursing job satisfaction, EBP knowledge uptake, and CPG knowledge uptake.

Nursing Care Processes (Adherence)

One hundred forty-four patient records were reviewed to evaluate CPG adherence. Figure 2 reflects all of the aspects of adherence that were evaluated. Adherence was defined as the percent of the appropriate components (see Table 5) of the CPG implemented as measured by documentation review. Adherence to the fall and pressure ulcer CPGs was evaluated separately. Table 5 outlines the number of records reviewed for each unit, each group, and in each project period.

Table 5. Number of Records Reviewed for CPG Adherence (N=144)

	# of Patient Records Reviewed at Period 1	# of Patient Records Reviewed at Period 2 (Intervention)	# of Patient Records Reviewed at Period 3 (Intervention)
Group 1 – n=72	24	24 (EBBR[1])	24 (EBBR & EBP ED)
Unit 1	12	12	12
Unit 3	12	12	12
Group 2 – n=72	24	24 (EBP ED[2])	24 (EBP ED & EBBR)
Unit 2	12	12	12
Unit 4	12	12	12

[1] EBBR = Evidence-Based Bedside Rounding; [2]EBP ED=Evidence-Based Practice Education

Records reflecting the documented work of Licensed Practical Nurses (LPNs) represented 13% (n=6) of the data collected in period 1, 18% (n=8) in period 2, and 19% (n=9) in period 3. The remainder of records reviewed in each period represents work documented by Registered Nurses (RNs). Despite the low numbers of charts evaluating LPN adherence (n=23), a statistically significant difference between LPNs and RNs was noted for adherence to the fall prevention CPG for patients at risk for falling (p=.02) and trends toward differences in adherence scores were also found (p=.09). Therefore, analysis for adherence was performed with and without Nurse Type (LPN or RN) as a second independent variable. When significant findings specific to nurse type were found, the results are described below.

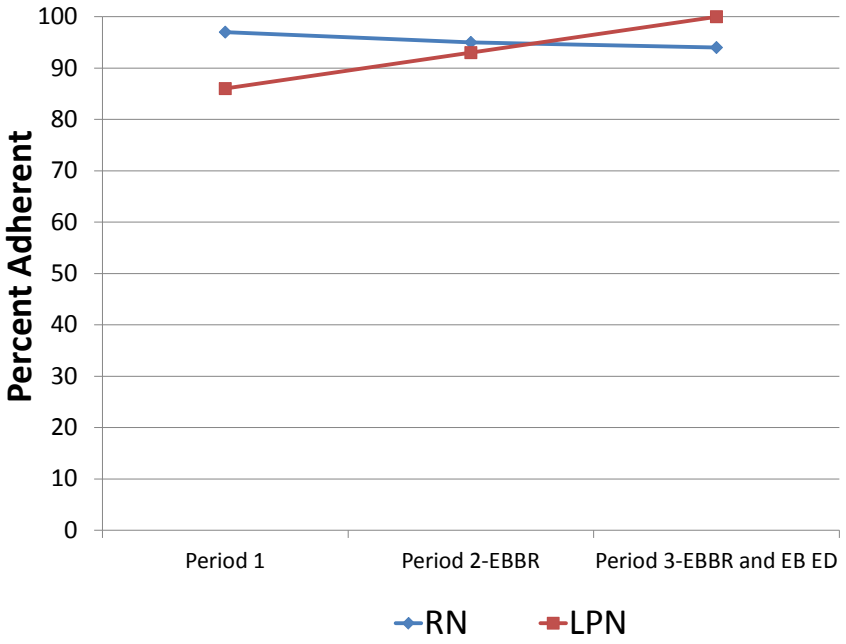
Subquestion 1 – Do Evidence-Based Bedside Rounds, Structured Evidence-Based Education, and Evidence-Based Bedside Rounds in combination with Structured Evidence-Based Education improve adherence to the fall prevention CPG?

In order to determine whether the project's three time periods had patients with equivalent risks for falling, average Morse fall scores were compared. Morse Fall Risk Scale scores were similar for all three study data collection periods indicating that patient risk for falling was consistent over the course of the project.

There was not a statistically significant difference between Group 1 (EBBR) period 1 and period 2 (after receiving EBBR education and attaining EBBR competency) fall prevention CPG adherence (Figure 6). LPN overall adherence to Fall Prevention CPG documentation and adherence variance between records improved from a period 1 mean of 88% (SD 0.25), to 93% (SD 0.15) after receiving the EBBR intervention and to 100% (SD 0.00) after both EBRR and EBP ED interventions were received. While improvements such as these are clinically impressive, they were not statistically significant. RN overall adherence to the fall prevention CPG related documentation was similar in all three data collection periods (97% [SD 0.10], 85% [SD 0.12] and 97% [SD 0.13], respectively).

Further analysis was conducted to evaluate individual CPG component impact on adherence scores. For Group 1, adherence with documentation of a Morse Fall Risk Scale score each shift was 100% at all three project time periods. Nurses in this group documented a Morse Fall Risk Scale score within 4 hours of admission 96% (SD 0.20) of the time and after receiving the EBBR intervention adherence increased to 100% (SD 0.00) and remained at this level in period 3. Increasing mean adherence scores, decreasing risk assessment documentation variance, and sustaining these improvements were all clinically significant changes but were not statistically significant.

Figure 6. Group 1 Fall CPG Adherence



Subquestion 2 – Do Evidence-Based Bedside Rounds, Structured Evidence-Based Education, and Evidence-Based Bedside Rounds in combination with Structured Evidence-Based Education improve adherence to the pressure ulcer prevention CPGs?

There was no statistically significant difference in skin breakdown prevention CPG adherence for Group 1 between periods 1, 2 and 3 (adherence 84%, 94%, and 96%, respectively). Group 2 adherence scores were 90% in period 1, 80% in period 2, and 97% in period 3. While most of these are clinically important improvements, a larger sample size might have been able to demonstrate a statistically significant difference.

The following individual components of skin breakdown prevention CPG adherence were not significantly improved ($p \geq 0.05$) following EBBR, EBP ED, or the combination of EBBR and EBP ED:

- Braden scale score documented within 4 hours of admission
- Braden scale score documented upon patient condition change
- Skin inspection documented within 4 hours of admission
- Skin inspection documented this shift
- Skin breakdown described in the patient record
- Skin breakdown noted in the transfer note
- Nursing orders generated when the Braden score was greater than 18
- Documentation of an appropriate specialty care bed
- For pressure ulcers stage 2 or greater, documentation of a CNS consultation
- A composite score of all documentation activities related to falls and pressure ulcer prevention

However, when considering only those patients at risk for skin breakdown (Braden Scale Score $\leq$ 18) from both groups, there were several clinically significant improvements. At period 1, nurses documented the admission Braden score within four hours 75% of the time.

Adherence to this CPG item improved to 100% when EBBR was performed and continued at 100% when EBP ED was added. For the one patient identified as at risk for skin breakdown, there was no nursing description of the appearance of the patient's skin at period 1 but this task was done on all 7 similar patients in period 3. To further clarify the impact of period 3 interventions (both EBBR and EBD ED), period 1 and period 3 adherence scores from all records were evaluated. Improvements noted are described in table 6.

Table 6. Combined impact of EBBR and EBP ED on documentation adherence for at risk patients

Documented Adherence Item	Period	N	Mean	Standard Deviation	*p*
Braden score within 4 hours of admission	Period 1 Period 3	5 11	0.80 1.00	0.45 0.00	0.14
Braden score documented each shift	Period 1 Period 3	5 11	0.40 1.00	0.55 0.00	0.002
Skin breakdown described in patient record	Period 1 Period 3	1 7	0.00 1.00	0.00 0.00	---
Nurse initiated orders for high-risk patients	Period 1 Period 3	5 11	0.60 0.73	0.55 0.47	0.64
Composite adherence for patients at risk for a pressure ulcer	Period 1 Period 3	5 11	0.65 0.92	0.36 0.13	0.04

Upon further analysis, Group 1's documentation of the Braden score every shift improved significantly (p=0.037) from period 1 of 50% to 100% in periods 2 and 3. When EBP ED was introduced first (Group 2), Braden scores were more frequently documented over time (0%, 100% and 100%, respectively) and nursing personnel more frequently recorded nurse initiated orders (0%, 17% and 50%, respectively). These clinically important improvements were not statistically significant.

Subquestion 3 – Do Evidence-Based Bedside Rounds, Structured Evidence-Based Education, and Evidence-Based Bedside Rounds in combination with Structured Evidence-Based Education decrease the patient fall rates or fall with injury rates?

Sixty-three patient falls occurred on participating units during the course of the project. Thirteen (21%) of these falls occurred between study periods. Twenty (32%) falls resulted in patient injury. All injuries were in the mild category. Seventy-five percent of the patients who experienced a fall were classified as at risk for falling according to the Morse Scale Score. Twenty-eight (44%) of the patients who fell were on the fall prevention protocol at the time of their fall.

In the units receiving EBBR first, fall rates decreased slightly when both EBBR and EBP ED were in use. In all other cases, as compared to the period 1 time period, falls and falls with injury rate change scores increased in both groups (see Table 7).

Table 7. Fall and Fall with Injury Rate Change Scores

	Group 1 Fall Rate % Change	Group 2 Fall Rate % Change	Group 1 Fall w/injury Rate % Change	Group 2 Fall w/injury Rate % Change
Period 1 & Period 2	+2.00%	+93.19%	+195. 65%	+68.98%
Period 1 & Period 3	-1.34%	+71.55%	+112.62%	-100.00%

In both project groups, there were no significant differences in fall or fall with injury rates between any time periods (see figures 7 and 8).

Figure 7. Group 1 Fall and Fall with Injury Rates

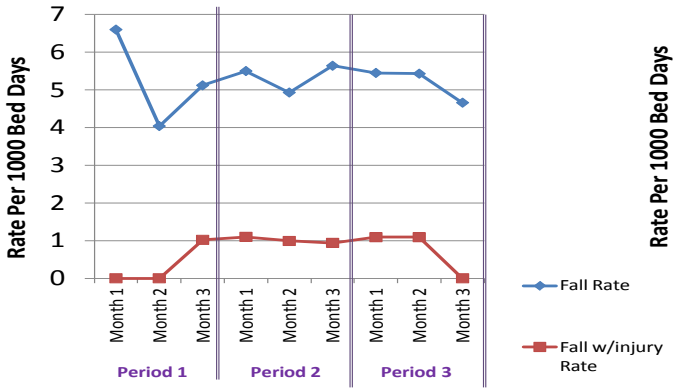
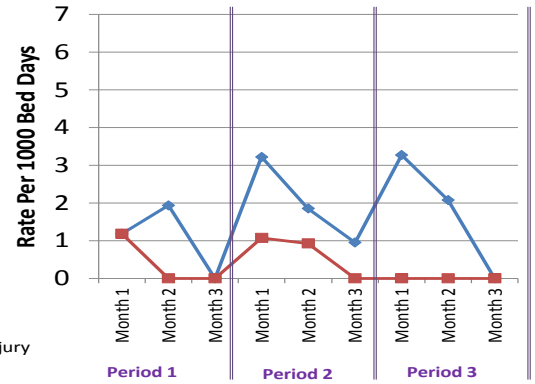


Figure 8. Group 2 Fall and Fall with Injury Rates



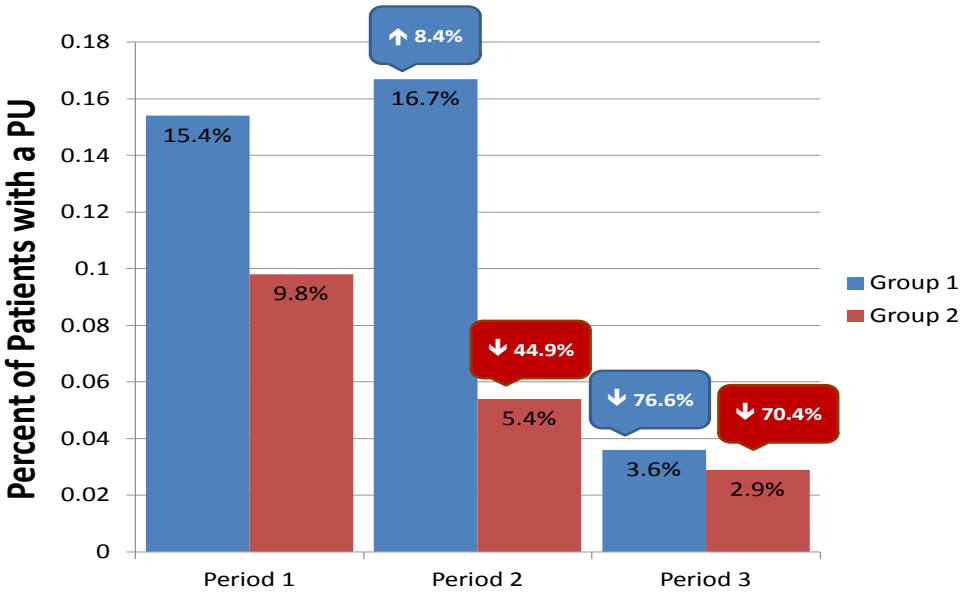
Subquestion 4 – Do Evidence-Based Bedside Rounds, Structured Evidence-Based Education, and Evidence-Based Bedside Rounds in combination with Structured Evidence-Based Education decrease pressure ulcer or healthcare associated pressure ulcer prevalence?

Two hundred twenty-eight patients were evaluated for the presence of pressure ulcers or healthcare associated pressure ulcers over the course of the project (80 at period 1, 85 in period 2, and 63 in period 3). Mean Braden Scale scores were similar in all three time periods for both groups indicating patient risk for pressure ulcers was consistent overtime: Group 1 – 19.4 (SD 2.7), 18.96 (SD 2.8), and 18.96 (SD 2.7); Group 2 – 19.6 (SD 2.1), 19.26 (SD 2.3), and 18.6 (SD 3.0) .

There were no statistically significant changes in pressure ulcer prevalence. In group 1 (EBBR offered first), pressure ulcer prevalence was similar in period 1 and period 2, then decreased in period 3. This implies that rounding alone did not impact PU prevalence, but

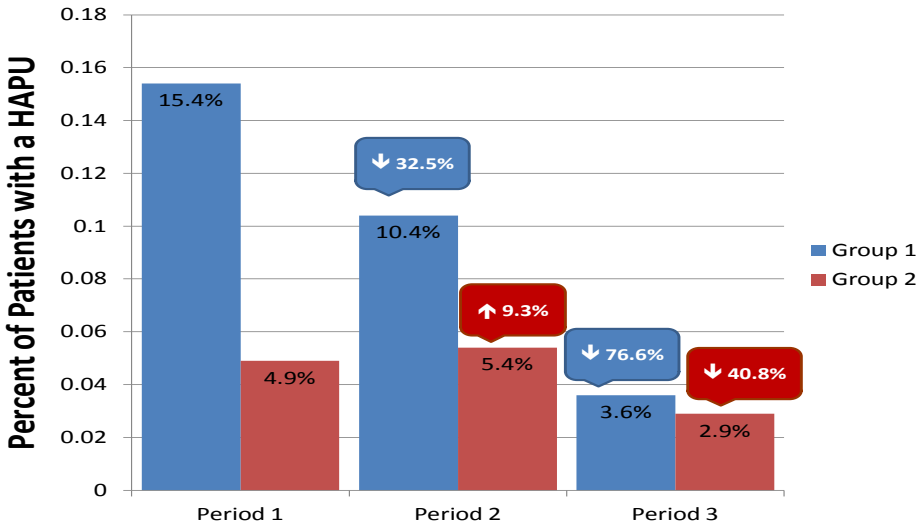
rounding with EBP ED may have had a role in decreasing this adverse event. Group 2 (EBP ED first) PU prevalence decreased in periods 2 and 3 (Figure 9).

Figure 9. Pressure Ulcer Prevalence Rates & Percent Change from Period 1



There were no statistically significant changes in healthcare associated pressure ulcer prevalence. In group 2 (EBP ED offered first), HAPU prevalence was similar in period 1 and period 2 then decreased in period 3. This implies that EBP ED alone did not impact HAPU prevalence, but EBP ED with EBBR may have had a role in decreasing the adverse event. Group 1 HAPU prevalence decreased in periods 2 and 3 (Figure 10). Although not statistically significant, the only period where both groups were below the national HAPU benchmark was the third period in which both EBBR and EBP ED were incorporated.

Figure 10. HAPU Prevalence Rates & Percent Change from Period 1



No PUs were avoided with EBBR alone. EB ED may have prevented two PUs, with a cost avoidance of approximately $9,694. When both EB ED and EBBR were incorporated, there were eight fewer PUs, with an estimated cost avoidance of $38,776.

Subquestion 5 – Do Evidence-Based Bedside Rounds, Structured Evidence-Based Education, and Evidence-Based Bedside Rounds in combination with Structured Evidence-Based Education improve patient ratings of satisfaction with nursing care?

There were no statistically significant changes in patient ratings of patient satisfaction (Table 8).

Table 8. Patient Ratings for the Single Item Satisfaction Question and the Three Survey Subscales

	Group 1 – EBBR First			Group 2 – EBP ED First		
	N	Mean	SD	N	Mean	SD
Overall, how would you rate your satisfaction with nursing care?*						
Period 1	58	6.50	0.94	59	6.53	1.10
Period 2	58	6.52	1.30	66	6.59	0.99
Period 3	54	6.48	1.21	58	6.76	0.57
Patient Satisfaction with Technical Skills Subscale*						
Period 1	58	6.53	0.85	59	6.64	0.60
Period 2	58	6.44	1.25	66	6.52	1.07
Period 3	55	6.58	.075	58	6.68	.058
Satisfaction with Caring About Patients Subscale*						
Period 1	58	6.46	0.92	59	6.42	1.23
Period 2	58	6.34	1.41	66	6.35	1.17
Period 3	55	6.55	.085	58	6.64	0.69
Satisfaction with Teaching & Providing Info Needed for Home Subscale*						
Period 1	57	5.99	1.28	59	6.27	1.31
Period 2	56	6.06	1.43	66	6.13	1.23
Period 3	53	5.98	1.50	56	6.22	1.12

*responses ranged from 1 (completely unsatisfied) to 7 (completely satisfied)

Subquestion 6 – Do Evidence-Based Bedside Rounds, Structured Evidence-Based Education, and Evidence-Based Bedside Rounds in combination with Structured Evidence-Based Education improve nursing staff perception of patient care quality, nursing staff effectiveness, and nursing job satisfaction?

Groups 1 and 2 had no statistically significant differences between any of the three periods (see Table 9).

Table 9. Nurse Ratings of Patient Care Quality, Nursing Staff Effectiveness and Job Satisfaction

	Group 1 – EBBR First			Group 2 – EBP ED First		
	N	**Mean**	**SD**	**N**	**Mean**	**SD**
How would you describe the quality of the nursing care delivered on your last shift?*						
Period 1	74	3.41	0.59	75	3.41	0.68
Period 2	44	3.48	0.49	60	3.38	0.64
Period 3	59	3.49	0.50	61	3.62	0.55
Nursing Staff Effectiveness Subscale**						
Period 1	76	4.00	0.63	76	4.03	0.55
Period 2	44	4.09	0.54	60	3.96	0.60
Period 3	59	4.05	0.53	64	3.99	0.61
Overall, how satisfied are you in your job?						
Period 1	75	4.16	0.94	76	4.01	0.90
Period 2	43	4.09	1.21	60	4.03	0.86
Period 3	58	4.21	0.85	57	4.05	0.79

*responses ranged from excellent (4), good (3) or fair (2)
** responses ranged from 1 (strongly disagree) to 5 (strongly agree)
*** responses ranged from 1 (very dissatisfied) to 5 (very satisfied)

In order to determine if EBBR with EBP ED had an impact on items and subscales from the nurse survey, period 1 data from both groups were aggregated and then compared to aggregated period 3 data. Two items, nurse perception of nursing care quality and responding to emergency situations, were significantly improved when both EBBR and EBP ED were used (see Table 10).

While this project was not designed to study cause and effect, improved nurse perceptions may have been related to EBBR, EBP ED or both in combination. Patient-centered rounding increased patient surveillance which may have influenced nurse perception of the unit's ability to respond to emergency situations. It is also likely that an implementation of evidence-based practice, rounding and CPG knowledge, may have contributed to higher ratings of nursing care quality.

Table 10. Nurse Ratings of Nursing Care Quality and Responding to Emergency Situations

	N	Mean	SD	*p*
How would you describe the quality of the nursing care delivered on your last shift?*				
Period 1	149	3.41	0.64	0.04
Period 3	120	3.56	0.53	
Our unit is very good at responding to emergency situations**				
Period 1	151	4.15	0.84	0.05
Period 3	123	4.33	0.75	

*responses ranged from excellent (4), good (3) or fair (2)
**responses ranged from 1 (strongly disagree) to 5 (strongly agree)

Subquestion 7 – Does Structured Evidence-Based Education improve evidence-based practice (EBP) knowledge uptake, and Clinical Practice Guideline (CPG) knowledge uptake?

Two hundred and thirteen nurses from Group 1 and 2 attended EBP ED. Out of this group, 205 completed a pretest and 213 completed a posttest for CPG knowledge uptake. In group 1, ninety-seven nurses attended EBP ED training with 91 completing pretest and 96 completing posttests. CPG and EBP test scores were denoted as the proportion of correct responses (0 minimum and 1.0 maximum). Scores significantly improved from pre to posttest (see table 11).

Table 11. Pre and Posttest Results

	Test Time	N	Mean	SD	*p*
Entire Sample CPG Test	Pre	205	0.83	0.08	<0.001
	Post	213	0.89	0.08	
Group 1 CPG Test	Pre	91	0.82	0.09	<0.001
	Post	97	0.90	0.08	
Group 2 CPG Test	Pre	114	0.83	0.08	<0.001
	Post	116	0.89	0.09	
Group 1 EBP Test*	Pre	91	0.73	0.28	<0.001
	Post	96	0.88	0.21	

*The EBP test was given to group 1 only.

Education is critical to uptake of new knowledge. Before this project started, nurses may not have known that a CPG was available or how to access CPG information. If nurses knew they existed, they may not have been confident in the content of the CPGs because they did not know the recommendations were based on strong evidence. Pretests demonstrated that a majority of nurses were knowledgeable about fall and PU prevention evidence-based practices. It was the few nurses with low scores on the pretest who demonstrated significant knowledge improvement after receiving EBP ED. We believe these courses were of benefit and they are being continued, not only because the scores improved, but also because of the very positive feedback from the nursing staff.

Relationship of current findings to previous findings

A total of 33 articles related to rounding, and fall and pressure ulcer prevention were reviewed (See Bibliography). No other studies were found that added PU prevention interventions to their rounding protocols. Studies with the most improvement in patient satisfaction ratings and fall prevention described their rounding protocol as being conducted every hour [2] [6] [7] [8]. Our project implemented rounding at least once every two hours and did not show the same dramatic improvements in fall prevention, patient satisfaction, or health associated pressure ulcers. We do not know if our non-significant results were related to a lack of sensitivity in our design limiting our statistical power, or if high period 1 patient satisfaction scores made measurable improvements hard to obtain.

Many articles described the education required to successfully implement a patient-centered bedside rounding program [2] [6] [7] [8] [9]; however, this was the first project to build in a sustainment piece with ongoing education and competency training. No previous studies compared rounding to another intervention. This project compared EBP ED and EBBR and found significant improvements in nurse perception of nursing care quality and responding to emergency situations when both EBBR and EBP ED were used. Similar improvement in perceptions of quality of care, as well as resource adequacy and professional relations, were found in another study [10].

Effect of problems or obstacles on the results

Since this was an evidence-based practice project, there were certain challenges identified during the course of the project:

1. Evidence-based practice education (EBP ED). The initial intent was to conduct web-based training on the participants' unit. However, computer access turned out to be an issue and our team resorted to one-on-one training. Refer to Specific Aim 2 on page 11 for a more detailed description of our solution.

2. Implementation. Because this was a funded research project, our team had the luxury of hiring a full-time project director to conduct the participants' training in both EBP ED and EBBR. For future EBP implementation endeavors, we would recommend a dedicated trainer to implement the education and provide support.

3. Sustainment. Before implementing a practice change like rounding, it is critical to consider the sustainment process. Changing the culture of an organization requires convincing the stakeholders of the importance, garnering leadership support and building trust among the participants that their efforts will have a long-term benefit.

Limitations

1. The project used a randomized, controlled counterbalanced design and four nursing care units from one hospital which was the highest level of design that was feasible and ethical. Use of a randomized, controlled trial with many nursing care units from several different hospitals would have provided a more powerful design and increased generalizability.

2. The clustered randomization technique used in this study is often advocated to minimize treatment contamination between intervention groups. Reduction of treatment contamination between nurses is important because erroneous diffusion of the intervention reduces the point estimate of an intervention's effectiveness and this reduction may lead to a type II error. The following procedures were incorporated to prevent treatment contamination:

    a. Prior to implementation of interventions, Dr. Loan, the project mentor, briefed all team members about intervention integrity and the threats of treatment contamination as well as our strategies to prevent it. At each team meeting a list of potential contamination occurrences were discussed. Using a "lessons learned" approach, measures to prevent or reduce each threat were evaluated and revision of our plan to reduce treatment contamination was implemented as needed. The team was instructed to be sensitive to signs of contamination of treatments.

    b. Nurses floating from one group to another posed a threat for treatment contamination. Fortunately Madigan nurses rarely floated between groups during period 2. Unit documentation of all episodes of nurse floating, including nurse's name, date, period of time and unit where floated, was a standardized practice on all participating units. During EBBR training and competency checks, nurses were reminded to refrain from using EBBR standardized rounding checklists and badge cards on units who had not started EBBR. Nurses receiving EBP ED training were asked to avoid discussing evidence-based practice and interventions with staff on units who had not started EBP ED. If floating to a unit implementing a different intervention was unavoidable, review of the float record was done to review date and time. A record of floating occurrences during the timeframe of potential contamination was compiled and reviewed during team meetings. Although there was a concern that participants floating to units at a different phase in the implementation process would result in contamination, this proved not to be the case.

    c. Treatment contamination prevention was included during the EBBR and EBP ED orientation and training sessions. Strategies to reduce treatment contamination were discussed to include refraining from discussion regarding evidence-based practice and interventions, discussion or use of EBBR behaviors, sharing of EBBR checklist or badge cards during contact with staff members and/or patients from units not currently using these techniques.

    d. Online training materials were accessed through restricted websites. For example, only nursing personnel from the EBBR group had access to EBBR training materials and tools. In addition, hardcopy materials had limited distribution to nursing personnel and patients on participating units. Nursing personnel were asked to sign for hardcopy materials (badge card) and avoid taking treatment tools and materials outside of their work areas. Rounding behavior signs were semi-permanently affixed in patient rooms to avoid transfer and use in other units. Patient education materials were printed and distributed directly by project team members to unit level leaders.

e. The use of electronic documentation (Essentris) and nursing initiated treatment order sets are standard documentation and treatment mechanisms on all participating nursing care units. During the study, the EBBR documentation drop-down menu and Admission NIO order sets, that included all steps to EBBR, were limited to units trained and performing these interventions throughout Period 1 data collection. These tools were made available to all participating units at the beginning of Period 2.

f. All group training classes were advertised and performed on nursing care units specifically randomized to the interventions. Sign-in, to include name and assigned unit, was required for all offerings and reviewed by the instructor prior to presentation of material. During period 1, if a nurse signed in to attend unscheduled training he/she was asked to reschedule for a class offered on his/her nursing care unit. Efforts were made to ensure all nurses felt important to the project and individual follow up was provided to ensure their unit specific training was complete.

Conclusion

In conclusion this EBP Project was hailed as a great success at all levels of the organization. Many products of this project have already been incorporated into clinical practice guidelines under consideration for the Army Nurse Corps. The cultural change underway due to the implementation of the ANC Patient CaringTouch System was bolstered by this effort to educate nurses in evidence-based practice which empowered them to advocate for change at the bedside resulting in improvements in quality of care. A few of the most notable findings include:

- LPN Fall CPG adherence increased from 83% to 100%
- RN & LPN PU CPG adherence increased from 65% to 92%
- PU prevalence decreased from 12.5% to 3.2% (all stages)
- Nurses' perceptions of care quality and perceptions of the unit's ability to respond to emergency situations improved significantly (p=0.04 and p=0.05, respectively)

While other rounding studies using only the 4Ps demonstrated decreased call light use and increased patient satisfaction, this is the first study that has decreased PU prevalence rate by using rounding. Adding evidence-based falls and PU prevention interventions to a rounding protocol is one resource-neutral way to improve patient outcomes, adherence to CPGs and nurse appraisal of care quality.

All project aims were achieved with lasting impact on the nurses who participated and great value projected for future nurses who will work on these units. The incorporation of EBP education and evidence-based bedside rounding to unit orientation programs demonstrates that the diffusion of innovation principles can lead to powerful change that advances the patient-centered care mission.

Significance of Study or Project Results to Military Nursing

Significance of results to military nursing clinical practice

The Army Medical Department (AMEDD) is responsible for caring for patients worldwide. It is comprised of a military and civilian nursing workforce in a mobile community frequently transferring among different facilities around the world. Historically, each medical facility has been responsible for establishing its own nursing care policies and procedures. Recently, however, the Chief of the Army Nurse Corps directed the implementation of The Patient CaringTouch System, a comprehensive model of evidence-based nursing care delivery system. Patient rounding fits firmly within the context of this model. One way the Army Nurse Corps is attempting to enact this change is to standardize best practices throughout the AMEDD by the implementation of clinical practice guidelines. The goal is to standardize nursing care provided throughout the Army Medical Command, decrease the work required to develop practice guidelines, and promote consistent unified focus on optimal patient outcomes resulting in decreased variability in nursing practice and smoothing the learning curve of staff as they rotate to different facilities.

Significance of results to leadership, management

While the results of this study did not show a significant decrease in the outcomes of patient falls and healthcare associated pressure ulcers, they did indicate an increase in the nursing perception of the quality of nursing care delivered on the individual's unit. This finding has implications for staff retention as nurses are more likely to remain in a place where they feel they are able to practice best care. For this process to continue, leadership buy-in highlighting the importance of rounding and the ongoing competency training is going to be critical for sustainment of the practice of rounding. Leadership faces challenges to sustainment related to novice nurse accessions, deployments, and frequent staff turnover. For these practices to be sustained during staff and leadership turnover, it will be important to incorporate the practices as policy and identify unit champions to teach and monitor ongoing competency assessments.

Significance of results to education

The literature has demonstrated the value of scripting the practice of rounding so that each staff member performs rounding the same way every time. This consistency helps the patients to know what to expect from staff members and allows them to trust the process so they also can bundle their requests to the nursing staff. In this study, two interventions were conducted in the training phase: implementation of evidence-based bedside rounds and evidence-based practice education which incorporated education on the two guidelines, fall prevention and skin breakdown prevention. The results showed that education did not impact nursing satisfaction but rounding did approach significance as described in the results section.

Significance of results to policy

For this study, two clinical practice guidelines were developed and approved to standardize care across the organization. The investigators developed a hierarchy for grading the evidence used in these practice guidelines. Our organization now grades and references all evidence within clinical nursing policies. The grading criteria has since been adopted within the Army Nurse Corps research community. With the push to standardize policies within the Army Nurse Corps, the Army Nurse Practice Council has recently approved the fall prevention clinical

practice guideline for AMEDD-wide implementation while the patient-centered bedside rounding clinical practice guideline is currently under review.

Summarize new knowledge and describe how the findings narrowed or closed a research gap

This study added to the evidence of rounding at least every two hours. Recent studies have shown that hourly rounding may be more effective than every two hours [2] [6] [7] [8]. This new knowledge has been incorporated in the clinical practice guideline for rounding that is currently under review. Additionally, a toolkit for rounding was developed that can assist any facility to develop and implement their own rounding program. It includes implementation tools and strategies, education and outcome measures.

Comment on the quality and generalizability of the new knowledge

The new knowledge is generalizable to similar medical, surgical, and step-down units in both military and civilian hospitals. Caution should be used in generalizing the results of this project to other types of units, such as pediatrics or critical care until more research has been done. An intentional combination of staff education, monitoring, and sustainment is critical to ensuring the long-term success of the intervention.

Recommendations for future research

More research is needed to compare the relationship of rounding intervals to patient outcomes. Additional research is needed to determine the type of unit that could benefit most from rounding and the staff mix required to achieve the desired results. Certainly, rounding is not the complete solution to fall and pressure ulcer prevention. Research should continue to determine the most effective nursing interventions for fall and pressure ulcer prevention so they can get closer to becoming never events. Lastly, exploration of the use of informatics to enhance or promote the utilization of protocols is needed.

Changes in Clinical Practice, Leadership, Management, Education, Policy, and/or Military Doctrine that Resulted from Study or Project

The following changes in practice were implemented directly as a result of this study:

1. Standardized evidence grading criteria. Prior to implementation of the study, the clinical practice guidelines for fall prevention and skin breakdown prevention were revised and the evidence for the interventions was graded using Madigan Army Medical Center Evidence Hierarchy for the strength and quality of the evidence. At Madigan, the nursing leadership decided that as each existing policy came up for review and as new policies were created, all policies would have graded evidence. This led to the Army-wide adoption of a common grading system using the Melnyck Fineout-Overholt [11] criteria to evaluate the strength of the evidence, and the Johns Hopkins Nursing Quality of Evidence Appraisal to evaluate quality [12].

2. Changes in electronic documentation. Prior to implementation of the study, a new admission order set was created that included standard fall and skin breakdown prevention interventions for all patients. Nursing initiated order sets were created for patients identified at higher risk for falls or skin breakdown that mirrored the interventions outlined in the policies. The study investigators identified a less burdensome mechanism to document rounding as a simple point and click for “Rounding” in the vital signs screen of Madigan’s electronic medical record.

3. Evidence-based practice education. As a direct result of this study, evidence-based practice education is now conducted at the monthly Medical Surgical Nursing Section orientation for new employees, nursing preceptor course, and during the Clinical Nurse Transition Program for newly accessioned Army Nurse Corps officers.

4. Adoption of the Iowa Model of Evidence-Based Practice to promote quality care. As a prerequisite for this project, all investigators were sent to the University of Iowa Advanced Practice Institute and trained in the use of the Iowa model. Subsequently, new nurse scientists and clinical nurse specialists have been trained in the use of the Iowa model. This model now serves as the basis for deciding upon and implementing new evidence-based practice projects.

5. Ongoing competency assessment. The issue of sustainability has been addressed in the Medical Surgical section by offering evidence-based practice education incorporating rounding in the monthly Medical Surgical Nursing Section orientation for new employees. Attendees are provided with the competency checklist for use with their preceptor. The Assistant Clinical Nurse Officer In Charge (ACNOIC) of each inpatient ward has been charged with overseeing the initial rounding training as well as ongoing competency assessment.

6. Audit tools for skin breakdown and fall prevention compliance. Unit documentation champions provide quarterly audit data for compliance in implementing the interventions for fall and skin breakdown prevention.

7. Individual Hospital to MEDCOM approach. The clinical practice guideline for Fall Prevention has been approved by the Army Nurse Practice Council. The clinical practice guideline for patient-centered bedside rounding has been submitted to the Army Nurse Practice Council for approval and subsequent MEDCOM-wide implementation.

8. Semiannual Pressure Ulcer Prevalence Survey. As a direct result of this project, a semiannual pressure ulcer prevalence survey composed of team members from the outpatient wound clinic, critical care and medical surgical clinical nurse specialists, staff nurses from all adult inpatient settings and nursing research has been implemented at this facility and is now in the sustainment phase.

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Summary of Dissemination

Type of Dissemination	Citation	Date and Source of Approval for Public Release
Podium Presentations	MAJ Linda S. Gowenlock Rounding for Results: It's More than the 4 P's National Association of Clinical Nurse Specialists (NACNS) Chicago, IL March 8, 2012 Madigan Healthcare System	pending
Poster Presentations	MAJ Linda S. Gowenlock Rounding for Results: It's More than the 4 P's Academy of Medical-Surgical Nurses (AMSN) Boston, MA September 7-11, 2011 TriService Nursing Research Program Dr. Mary McCarthy , RN, PhD Rounding for Results: It's More than the 4 P's The Association of Military Surgeons of the U. S. (AMSUS) San Antonio, TX November 6-9, 2011 Madigan Healthcare System	26 May 2011 Madigan Healthcare System

Reportable Outcomes

Reportable Outcome	Detailed Description
Applied for Patent	None
Issued a Patent	None
Developed a cell line	None
Developed a tissue or serum repository	None
Developed a data registry	None

Recruitment and Retention Table

The Madigan Institutional Review Board approved a sample size comprised of a maximum of 750 patients and 360 nurses.

Patient Sample

A total of 704 patients received a project survey (Table 12). Patient participation in this project was cross-sectional therefore retention of patient participants was not a consideration.

Table 12. Patient Satisfaction Survey Distribution and Return Data

Period 1	**Group 1**	**Group 2**	**Total**
Distributed	120	118	238
Returned	58	59	117
Response Rate	48%	50%	49%
Period 2			
Distributed	112	125	237
Returned	58	66	124
Response Rate	52%	53%	52
Period 3			
Distributed	122	107	229
Returned	55	58	113
Response Rate	45%	54%	49
Total Distributed			704
Total Response Rate			50%

Nurse Sample

Three hundred and thirty-nine nurses participated in this project. Most received one or more project nurse surveys and/or consented to be observed for EBBR adherence (n=335). Four consented for EBBR adherence observations, but were not available during the survey distribution. Nurses may have received the survey one, two or three times depending on the length of time they worked on a participating unit. All available nurses on participating units received surveys (Table 13).

EBBR adherence observations were done on Group 1 only in period 2 and Groups 1 and 2 in period 3. There were 204 nurses working on participating units during these time periods. All 204 nurses were approached to give consent to be observed for EBBR adherence observations. Of these, 142 consented to adherence observations. Nurse participation in this study was cross-sectional therefore retention of nurses was not a factor in this project.

Table 13. Nurse Survey Distribution and Return Data

Period 1	**Group 1**	**Group 2**	**Total**
Distributed	114	112	226
Returned	76	76	152
Response Rate	67%	68%	67.5%
Period 2			
Distributed	125	130	255
Returned	44	60	104
Response Rate	35%	46%	41%
Period 3			
Distributed	121	113	234
Returned	59	64	123
Response Rate	49%	57%	53%
Total Distributed			715*
Total Response Rate			53.8%

*Some nurses received and returned surveys in one or more periods.

Figures below represent nurse EBBR adherence observation participation as this is the only component of the project that required signed informed consent.

Recruitment and Retention Aspect	**Number**
Participants Projected in Grant Application	150 (grant application p. 43)
Participants Available	204
Participants Contacted or Reached by Approved Recruitment Method	204
Participants Screened	204
Participants Ineligible	29*
Participants Refused	33
Human Participants Consented	142
Participants Who Withdrew	0
Participants Who Were Randomly Selected to Be Observed	72
Participants Who Were Not Randomly Selected to Be Observed	70
Participants with Incomplete Data	0

*Ineligible due to change in duty role, duty location or station.

Demographic Characteristics of the Sample

Characteristic Characteristics of nurses consented for EBBR adherence observations.	
Age (yrs)	Not Collected
Women, n (%)	Not Collected
Race	
White, n (%)	Not Collected
Black, n (%)	Not Collected
Hispanic or Latino, n (%)	Not Collected
Native Hawaiian or other Pacific Islander, n (%)	Not Collected
Asian, n (%)	Not Collected
Other, n (%)	Not Collected
Military Service or Civilian	
Air Force, n (%)	0 (0%)
Army, n (%)	65 (45%)
Marine, n (%)	0 (0%)
Navy, n (%)	0 (0%)
Civilian, n (%)	80 (55%)
Service Component	
Active Duty, n (%)	65 (45%)
Reserve, n (%)	0 (0%)
National Guard, n (%)	0 (0%)
Retired Military, n (%)	0 (0%)
Prior Military but not Retired, n (%)	0 (0%)
Military Dependent, n (%)	0 (0%)
Civilian, n (%)	80 (55%)

Final Budget Report