

THE EFFECT OF AN EDUCATIONAL INTERVENTION ON FACILITY STAFF  
KNOWLEDGE REGARDING PRESSURE ULCER CARE

by

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## ABSTRACT

Three million pressure ulcers occur in the United States in a year. Pressure ulcers are painful, stressful, and costly to treat and may be preventable. In a frontier facility, staff education about new techniques for preventing and treating pressure ulcers is often problematic. In the rural area, there are fewer opportunities, less money, less time for training and education of staff as well as high staff turnover. These obstacles to nursing staff's ability to maintain competency can lead to less than optimal care. The simple act of reading an article or attending a lecture can increase pressure ulcer knowledge.

The purpose of this study was to examine nursing staff knowledge before and after an educational intervention in a frontier critical access/nursing home facility. Knowledge scores did increase but because of the small sample, size statistical significance was not obtained although the knowledge score increased. Increased educational opportunities can improve pressure ulcer knowledge in a rural facility.

## CHAPTER 1

## INTRODUCTION

Introduction to Study

Pressure ulcers can be painful, stressful and costly to treat (Ayello, Baranoski, & Salati, 2006). Despite all available measures, there are three million pressure ulcers in the United States of America per year and the cost per ulcer averages five thousand to fifty thousand dollars (Hammett, 2007). These wounds are preventable and multiple treatment measures are available. One intervention to prevent pressure ulcers is education to care providers which has been suggested to improve patient outcomes (Smith & Waugh, 2009). Ayello and Meaney (2003) stated that during the past decade, there has been an explosion of pressure ulcer knowledge related to the increase of research, but the nursing staff is not always aware of current updates in pressure ulcer prevention and treatment. Nurses in the rural area have fewer opportunities for education than the urban nurses (Zulkowski & Ayello, 2005).

Problem

There are numerous explanations for the nursing profession to lack knowledge of current evidence based practice. The educational opportunities can require significant travel away from the facility, out of pocket costs, and time off from a setting, that is generally understaffed. In addition, the incidence of staff turnover has increased in recent years, making it difficult for a facility to maintain a pressure ulcer education program and

necessary to maintain the education base of the nursing staff. This lack of knowledge can lead to less than optimal care if the nursing staff is practicing outdated methods or inconsistent therapies.

### Purpose of the Study

The purpose of the project was to explore the nursing staff's pressure ulcer knowledge in a rural setting, offer an education intervention, and determine if the intervention improved the nurses' knowledge regarding pressure ulcer prevention. The study explored staff knowledge related to the care of pressure ulcers by the nursing staff of a selected facility through the implementation of a testing tool.

In Zulkowski and Ayello's study conducted in 2004, the average score was 76%. "Knowledge is power" and Ayello & Meaney, (2003) study; illustrated that knowledge is a method to change behaviors. Healthcare workers are dedicated to provide quality care to their patients. The deduction could be made that the prevention and the care of pressure ulcers should improve after the nursing staff has acquired appropriate knowledge related to the early recognition of skin breakdown and treatment of pressure ulcers.

### Background

As the incidence of pressure ulcers continues to rise, one measure of prevention and treatment is to educate the nursing staff. It is difficult to obtain new information for the rural nurse, due to distance, time constraints and possibly financial reasons. Related to the fact that the pressure ulcers are a problem and expensive, the educational intervention

increasing staff knowledge on prevention and treatment should improve patient outcomes.

Pressure ulcers are a common problem in health care and can be burdensome for both the patient and caregiver. Pressure ulcers develop because of blood vessel occlusion from external pressure and from a disruption of circulation related to shearing force (Lindsey Anton, 2005). Prevention of pressure and maintenance of circulation with a variety of techniques can decrease the incidence. Data suggest that up to forty-five percent of pressure ulcers were preventable (Jones, 2007).

Specific groups such as nursing home residents are at higher risk for development of pressure ulcers, with an incidence ranging of 1.9 percent to 23.9 percent (Hammett, 2007). Another at risk population includes victims of spinal cord injury patients (Garber, Rintala, Holmes, Rodriguez & Friedman, 2002). Managing both pressure relief and comorbidities may decrease the occurrence of pressure ulcers. By studying the existing knowledge, current documentation, current techniques and the treatment of pressure ulcers, education can be used to correct most shortfalls in the nursing staff's knowledge (Anton, 2006). The use of evidence-based preventative care should be available to all practice settings. In as late as 2005, Turkish nurses were using massage and rings even though these treatments have been outdated for over twenty years. (Anton, 2006).

Limited application of knowledge is a common problem in clinical practice (Gunningberg, Lindholm, Carlsson, & Sjoden, 2001). Not all nursing staff are aware of or using the up-to-date protocols and may have not been exposed to current evidence-based practices. By determining nursing staff's knowledge deficit, a focused education intervention can be offered to improve their knowledge of pressure ulcer prevention and

treatment. Increased knowledge may improve patient outcomes (Smith & Waugh, 2009). The National Pressure Ulcer Advisory Panel noted that by correctly identifying the stages, the nurse can appropriately treat the pressure ulcer. But research shows a lack the skills to identify the correct stages, (Ayello, Baranoski, & Salati, 2006), can lead to an increased incidence of pressure ulcers.

There are various explanations for nursing staff's lack of knowledge related to current recommendations for pressure ulcer treatment. These methods result in an inconsistent approach and knowledge altered by lack of money, time and personal drive. Additionally, nursing staff turnover makes it difficult for a healthcare facility to maintain a current pressure ulcers education program (Law, 2003). When faced with these obstacles, the nurse is less likely to seek education, may fall behind in her knowledge, which can lead to less than optimal pressure ulcer care.

### Setting

The project took place in a frontier community critical-access hospital located in Montana. The nursing staff was given a pretest in September 2009, an educational intervention and a posttest during the month of February 2010. The community has a population of approximately six thousand people; is classified as a frontier town, and the closet major medical center is fifty miles away. The facility is a ten-bed critical-access hospital with a thirty-four bed skilled nursing home. There is a medical clinic attached to the facility, which houses both primary care providers and an optometrist. A forty-bed stand-alone nursing home is located in the community and was not included in the study. There are no organized professional nursing associations in the community to foster

ongoing education. Due to limited time, staff, and finances for education in the community neither facility has a wound care team. The closest wound care clinic is fifty miles away and after obtaining an appointment, either the family or the facility must arrange for transportation. Without family or facility support, even this service could be unavailable to the patient.

### Definitions

The definitions are presented to assist the reader in understanding this study.

**AHCPR – Agency for Health Care Policy and Research:** AHCPR is an agency whose goal is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans.([www.ahrq.gov](http://www.ahrq.gov), 2010)

**CAH – Critical Access Hospital:** A facility that meets the criteria designated by Center for Medicare and Medicaid Services (CMS) as a CAH: which includes criteria such as participating in Medicare, must be located in a rural area, and can be no more than 25 inpatient beds, must have 24 hour Emergency care services and inpatient stays need to be an average of 96 hours. See CMS website for more criteria. ([www.hhs.gov](http://www.hhs.gov), 2010)

**NDNQI – National Database of the Nursing Quality Indicators:** NDNQI is a proprietary database of the American Nurses Association. The database collects and evaluates unit-specific nurse sensitive data from hospitals in the United States.(NDNQI, 2010)

**Pressure Ulcer Training Program:** The computer-based program designed by the National Database of Nursing Quality Indicators.

**Nursing Home:** A nursing home, convalescent home, skilled nursing unit that provides a type of care of residents; it is a place of residence for people who require constant nursing care and have significant deficiencies with activities of daily living. Residents include the elderly and younger adults with physical or mental disabilities. Residents in a skilled nursing facility also have access to physical, occupational and other rehabilitative therapies. ([www.hhs.gov](http://www.hhs.gov), 2010)

For this study the facility used was both a skilled nursing home and a critical-access hospital.

## Conclusion

Considering limited education opportunities in a frontier community, the purpose of the project was to explore the nursing staff's current knowledge of pressure ulcers; to develop an education intervention after analyzing the pretest responses, and then to measure any increased knowledge about pressure ulcers through use of a posttest. The goal was for the posttest scores to be higher than the pretest scores. The presumption that knowledge is power should support that the staff education regarding pressure ulcers is an important strategy in accomplishing pressure ulcer prevention.

## CHAPTER 2

## REVIEW OF LITERATURE

Review of Literature

This chapter will review the fact that the number of pressure ulcers is increasing and the literature available related to staff knowledge of pressure ulcers. The importance of learning new developments, how identifying outdated treatments, and factors that prevent the learning and the importance of treating the pressure ulcers will be included.

Nurse

Nationally, the number of pressure ulcers is increasing and there are many explanations for this increase. It is difficult to treat ulcers and there is a lack of methodologically sound trials supporting the effectiveness of pressure ulcer interventions (Catania, Huang et al., 2007). Implementation of basic nursing measures should decrease the number of pressure ulcers. The fundamental act of educating nursing staff on prevention and treatment techniques has been shown to decrease the number of pressure ulcers. One method of measuring pressure ulcers and the effectiveness of the various treatments is to monitor the incidence. An additional area of study is the various types of treatments and their effectiveness.

The extant amount of literature demonstrates obvious concern regarding the development of pressure ulcers and their treatment. This same literature highlights both prevention and treatment of pressure ulcers (Lewis, Pearson, & Ward, 2003). The

extensive literature indicates the need for additional nursing staff knowledge. Skin assessment and pressure ulcer care is a fundamental daily nursing activity; however, nursing staff often fall short in keeping abreast of recent treatments and recommendations. Maintaining competence in this extremely important nursing care practice has been decreasing as demonstrated by data showing statistically increasing incidence of pressure ulcers (Gunningberg, Lindhom, Carlsson, & Sjogren, 2001). Skin care is a fundamental nursing skill. Nursing staff may see this as elementary and not feel the need to focus education energy on skin care. There are many nursing homes that do not have access to expert wound care consultation to stay current, especially in the rural areas (Hammett, 2007).

Outdated treatments used for pressure ulcer management are directly related to the lack of current guideline knowledge (Pancorbo-Hidalgo, Garcia-Fernandez, Lopez-Medina, & Lopez-Ortega, 2007). Many long-term care nurses may not be aware that changes in pressure ulcer treatment have occurred. Lack of continuing education and updates in recommended treatments leads to the use of outdated, less effective treatments. Without awareness of new therapies or education, these same nurses will continue to use outdated treatments. Nurses want to prevent pressure ulcers, but practices are haphazard and erratic related to lack of time, staffing levels and current educational opportunities (Catania, Huang et al., 2007). Nurses are willing to change, but due to fear of change and the unknown, nurses tend to cling to previous practices (Moore & Price, 2004).

The National Pressure Ulcer Advisory Panel identified that nursing staff can not accurately stage a pressure ulcer particularly the Stage I pressure ulcer, which can lead to further deterioration (Ayello et al., 2006). In addition, 13.7 percent of Stage I pressure

ulcers progress to a higher stage (Elliot, McKinley, & Fox, 2008). This emphasizes the need for staff knowledge to accurately recognize early signs of skin breakdown and initiate appropriate treatment to ensure further wound deterioration does not occur. Early recognition and appropriate wound treatment should reduce the morbidity and cost of pressure ulcer treatment.

In response to the increase incidence of pressure ulcers there has been an increase in research both for prevention and treatment (Ayello & Meaney, 2003), but has additional research increased the clinical nurse knowledge regarding pressure ulcer treatment? Protocols have been established as a result of the increased research, but nursing staff may not apply the standards to the patient (Catania, Haung, James, Moran & Ohr, 2007).

In view of the fact that knowledge is essential to deliver care, nursing staff must be fluent in evidence-based practices. Per Glenhill and Hampton (2005), the level of overall pressure ulcer knowledge displayed by qualified nurses was found to be deficient. These same nurses are directing certified nurse assistants or unlicensed assistive personnel who deliver the majority of the care. The entire interdisciplinary team should be aware, knowledgeable and proficient in the National Clinical Practice Guidelines to reduce pressure ulcers. Prevention is the responsibility of all health care professionals; use of knowledge and skills are essential to implement the preventative care (Moore & Price, 2004). Moore and Price assert that all pressure ulcers are preventable. This information leads one to ask what measures need to be implemented to prevent pressure ulcers? It is anticipated that increasing staff knowledge is one measure, which will decrease the incidence of pressure ulcers.

When tested about pressure ulcer knowledge, it was found there was an increase of knowledge by nursing staff through the basic act of reading an article or recent attendance of a lecture regarding the prevention and treatment of pressure ulcers (Gunningberg, Lindholm et al., 2001). Many factors are attributed to the nurses' lack of knowledge. Most noteworthy is the decrease in the knowledge of nurses with over twenty years of experience (Pancorbo-Hidalgo, Garcia-Fernandez, Lopez-Medina, & Lopez-Ortega, 2007). Higher levels of licensure and education indicate that a registered nurse (RN) scores higher than a licensed practical nurse (LPN). Because these factors affect pressure ulcer care, education of the working nurse could be advantageous, as the RN is in a unique position to oversee and teach the multidisciplinary care team (Pancorbo-Hidalgo et al., 2007). Nurses who attended a wound conference had higher test results, as compared to the nurse who had no exposure to any education opportunities (Beeckman, Schoonhoven, Boucque, Maele, & Defloor, 2008).

### Patient

Pressure ulcers are an important problem at all levels of the American healthcare system, from patient care, and patient discomfort, to the millions of dollars being spent on an annual basis. Pressure ulcers can take months to heal and are associated with multiple readmissions, not only for the ulcer, but for related conditions as well (Jones, 2007). Proper assessment followed by treatment of pressure ulcers can require more than one care provider, large blocks of time, and expensive custom created supplies. In addition, the ulcer causes pain and fatigue to the patient (Catania, Huang et al., 2007). Pressure ulcers may increase the length of stay in a hospital, be responsible for temporary

placement into alternative settings, slow rehabilitation progress and delay discharge from a facility (Wilson & Logan, 2005).

The prevalence of pressure ulcers is monitored in long term care facilities, and treated as an indicator of poor care (Hammett, 2007). Predicted population increase related to baby boomer retirement and resultant long term care needs are directly linked to a predicted increased incidence of pressure ulcers (Panfill, 2006). Statisticians predict that the number of ulcers will rise in conjunction with the rise of elderly population (Moore & Price, 2004). The implementation of appropriate and timely pressure ulcer interventions will help the number of pressure ulcers remain constant or decrease.

Modern technology and advances in preventative equipment imply that health care workers have the tools to heal the pressure ulcer, but the process is not that simple. These wounds can be significant both financially and emotionally (Ayello, Baranoski, & Salati, 2006). In the nursing home, pressure ulcers affect the frail elderly by increasing pain and stress, and altering their self-image. In addition to pain, a pressure ulcer can debilitate both the mobility and the social aspect of the patient's life (McQueen, Gold, McLennan, & MacDiarmid, 2008) There is also the risk of infection related to the break in the body's defense system. Infections can become systemic, which then leads to an increased chance of premature death (Gledhill & Hampton, 2005). Furthermore, the wound can deteriorate to a stage in which surgery is necessary to debride or close the wound (McQueen, Gold, McLennan, & MacDiarmid, 2005). Proper assessment followed by treatment of pressure ulcers can require more than one care provider, large blocks of time, and expensive supplies.

Utilizing an evidence-based educational intervention, nursing staff are more likely to identify and initiate appropriate treatment of pressure ulcers, which should lead to better outcomes.

### Conclusion

Related to the recent increase of research, there is now protocols and guidelines that have been established. Additionally in the rural areas, the nursing staff may not know protocols, guidelines or current therapies. Reading an article or attending a conference has demonstrated an increase in care provider knowledge; therefore, an educational interventions are provided, pressure ulcer outcomes will improve.

## CHAPTER 3

## METHODOLOGY

This was a descriptive study using a pretest and posttest design while exploring the effectiveness of an educational intervention of pressure ulcer care on staff knowledge. First, the researcher determined the areas for improvement by reviewing incorrect responses, offer an educational intervention about prevention and care of pressure ulcers. Retesting with the Pieper Pressure Ulcer Knowledge Test was employed to measure changes in staff knowledge about pressure ulcer care. Comparison between pretest and post test scores was completed to measure improvement.

Ethic Considerations

The staff was approached prior to the pretest and instructed that this was a study regarding current staff knowledge and then the test was then administered, but choice to participate was theirs. The reason for the project was explained and verbal consent given with the participants completing the test and returning it to the researcher. The test results were not shared with any of the administration and anonymity was maintained throughout the pretest and the posttest. Findings cannot be lead to any individual participant. Facility administration was supportive of any educational interventions and there was no risk to the participants. Approval from Institutional Review Board was applied for and obtained in October 2010.

### Sample

A convenience sample was used for this study. Selection was accomplished as the staff nurses who were able to attend the in-service and to complete both the pretest and the posttest. The sample included all of the nurses at the facility who attended two in-services. Seven nurses completed the Pieper Pressure Ulcer Test both times and six additional nurses who completed it once. The first in-service was conducted by a nurse who attended the 2009 Wound Management Conference. She talked about the new treatments and advances in wound care. The test was administered before her talk. The incorrect responses were reviewed for which questioned were most often incorrect, then generalized into content areas. The educational in-service was focused in content, highlighting knowledge deficit areas from the initial test. Additionally, a separate cohort of three individuals who were unable to attend the education intervention, were tasked with a completion of the online NDNQI Pressure Ulcer Training Program. The NDNQI Pressure Ulcer Training Program is a web-based program that is available to anyone and has information about the stages and treatment of pressure ulcers.

### Instrument

The first study using the Pieper Pressure Ulcer Knowledge Test had an average score of 76 percent (Zulkowski & Ayello, 2005). This study's goal is to have a higher score before and certainly after the education intervention.

The study includes the administration of the Pieper Pressure Ulcer Knowledge Test, which was developed in 1993 using the AHCPR's *Pressure Ulcers in Adult*

*Prediction and Prevention* as a guideline for the questions and answers. The test was sent to four enterostomal therapy nurses to establish content validity and was rated appropriate. Next, the test was administered to 10 nurses who had no difficulty reading or understanding the questions (Pieper & Mott, 1995). The Pieper Pressure Ulcer Knowledge Test consists of 46 questions with the response of true, false or don't know. The test is divided into three areas: prevention, staging and general wound knowledge. Scoring was the percentage of correct responses, divided by the total. To assess the knowledge of the nursing staff a valid and reliable instrument was needed. The study used the Pieper Pressure Ulcer Knowledge Test, first used in 1995 for other studies with accurate results. As this test was successful in previous studies, it was felt that it would be a valid tool for this study.

#### Education Intervention

The educational intervention was developed after analysis of the questions missed and the content areas that the questions covered. The most frequent missed questions involved the aspect of prevention with the frequency of repositioning and the equipment used as an adjunct for pressure relief. Repositioning and use of adjunct equipment were the top four questions marked incorrectly. The next most frequently missed question was the definition of a Stage II ulcer, so the educational intervention also included all of the stages of pressure ulcers including the newest stage of "unstageable." The educational intervention was offered at three different times over two different days; all but three of the nursing staff attended the in-service. The intervention included a Power Point presentation and also discussion of specific case studies with skin issues. An on line

pressure ulcer education was found after searching the pressure websites for further information. This educational tool was assigned to the three nursing staff members that were unable to attend the in-services, because of illness, or vacation.

### Procedure

A staff nurse attended the Wound Conference in Great Falls in October 2010, and she gave a presentation of what she learned about wounds. Before the presentation, the Pieper Pressure Ulcer Knowledge Test was given to seven nurses that attended the program. Prior to the test the nursing staff was informed of the purpose of the study and verbal consent was obtained.

The researcher analyzed questions that the nursing staff marked incorrectly. The questions were reviewed and incorrect responses were classed into areas of prevention and staging. A Power Point educational intervention was developed including the stages of pressure ulcers and prevention techniques along with the treatment needed for each of the stages. The educational intervention was presented to the staff, followed by the posttest.

The study was to determine if the Pieper Pressure Ulcer Test scores of the nursing staff increased after the implementation of an educational intervention. The intervention included an algorithm for pressure ulcer treatment. Pressure ulcer stages were reviewed along with the treatment of each stage.

### Data Analysis

Data was analyzed using the SPSS 18.0 program to determine statistical significance. Items were examined for descriptive use for mean, mode and range. The questions were tallied for percentage of correct. The means were tested utilizing the T-Test to determine statistical significance but due to the small sample size a statistical significance could not be determined. If the same results were accomplished with a larger sample size, the results could reach statistical significance. The sample did display improvement from the initial score to the posttest score. As per the review of literature, the RN mean was greater in both the initial and the posttest than the scores of the LPN.

### Summary

The researcher assessed seven nurses' knowledge of pressure ulcer care and prevention, provided an educational intervention and administered the posttest, a repeat of the Pieper Pressure Ulcer Knowledge Test.

## CHAPTER 4

## RESULTS

Introduction

The study was designed to explore the nursing staff's pressure ulcer knowledge and the knowledge level after the educational intervention. This chapter will review the demographics and the data collected. Comparisons were analyzed regarding educational levels, experience, and recent exposure to new treatments.

Demographics

In analyzing the demographics, the staff nurses ranged in age from thirty-eight to sixty-three, with the average of fifty-two. Total average years of experience was sixteen years but forty-three percent of the group had either over fifteen or over twenty and the final fourteen percent had over ten years of experience. Eighty-six percent of the nursing staff recently read an article on pressure ulcer care. Forty-three percent of the staff knew about the guidelines and read them, but the other fifty-seven percent did not report any exposure to pressure ulcer education.

The nursing staff included 43 percent RNs (3) and 57 percent LPNs (4). The highest education levels were two BSN and the other five were diploma nurses. One of the staff had a certification; all were female, and all were working in long term and acute care. Forty-three percent (3) of the participants read or knew of the standard treatment guidelines. See table 1.

Only 29 percent of the nursing staff had read a book on pressure ulcers in the last year, with 71 percent that had not read a book on pressure ulcers. These same percentages apply for nursing staff that sought information on the internet and those that had not. Additionally 71 percent had not read the Clinical Guidelines. One nurse or 14 percent of the nursing staff had read a book in the last year. Eighty-six percent (6) of the nursing staff has attended a lecture on pressure ulcers; 29 percent in the last year, 29 percent in one to three years and 43 percent over 4 years ago. See table 1.

Table 1. Comparison of Demographics

	<u>Percentage of study group</u>
RN	43
LPN	57
10 – 15 years of experience	14
15 – 20 years of experience	29
Over 20 years of experience	57
Certification	14
No certification	86
Read book on pressure ulcers	29
Did not read book on pressure ulcers	71
Sought information on internet	29
Did not seek information on internet	71
Read Clinical Guidelines	29
Has not read Clinical Guidelines	71

Table 1. Continued

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	<u>Percentage of study group</u>
Last time read an article on pressure ulcers	
In last year	86
1-3 years ago	14
Attended a lecture on pressure ulcers	
Has not attended a lecture on pressure ulcers	14
Attended lecture	
In last year	29
1-3 years ago	29
Over 4 years ago	43

---

The average score for the RN went from 83 on the pretest to 88 on the posttest, with the LPN average score starting at 79 and increasing to 86.5. Nurses with greater than twenty years of experience had the average score of 79 on the pretest, and had an increase to 88 on the posttest. Matching closely were the nurses with less than 20 years of experience with an average pretest score of 82, which increased to 89 for the posttest. Interestingly, the nursing staff who knew of the guidelines had an average pretest score of 79, compared to those who did not know the guidelines who had a pretest score of 83. Both groups had an increase in score for the posttest, with those that knew the guidelines to 86.5 and those who did not know the guidelines to 88, which means that the group who knew the guidelines had a greater increase. The nursing staff who read an article in the last year started with an average score of 81.5 and ended with 87, and those who had not

read an article started with an average score of 76, with an increase to 85. Interestingly, the nursing staff that attended a lecture in the last year initially had a pretest score of 80, with the nursing staff that had not attended a lecture having a pretest score of 81. The staff that had attended the lecture only improved to 83, with those who had not attended a lecture improved to 90 percent. The BSN nurses were a small percentage and their pretest score was 84, but only improved to 85, whereas the diploma nurses began with a lower score of 79, but increased to 87. Those that sought information on the internet, had a pretest average of 81.5 where those who had not sought information had a pretest average of 76, but both increased their scores to 87 and 85 respectively. See table 2

Table 2. Comparison of Pretest and Posttest Scores

	Average score	
	Pretest	Posttest
RN	83	88
LPN	79	86.5
Nurses with greater than 20 Years of experience	79	88
Nurses with less than 20 Years of experience	82	89
Knew of the guidelines	79	86.5
Did not know of the guidelines	83	88
Read an article in the last year	81.5	87
Has not read an article in the last year	76	85

Table 2. Continued

Attended a lecture in the last year	80	83
Did not attend lecture in the last year	81	90
BSN	84	86
Diploma	79	87
Sought information in last year	81.5	87
Did not seek information in last year	76	85

The scores were also compared to other testing results from previous studies. Both the scores were greater before the educational intervention and the post educational intervention (K. Zulkowski, personal communication, October 7, 2010). See table 3.

Table 3. Comparison of Previous Study to Current Study Percentages

Rural	Urban Site 1	Urban site 2	VA time one	VA time two	Current study Pretest	Current study posttest
77	74.5	74	78	81	82	86

Testing done by Piper and Mattren in 1997 found a mean score of 72%, followed by the study completed by Ayello and Zulkowski in 2003 with a mean score of 76% (Zulkowski & Ayello, 2005). This improvement in knowledge over the last six years shows the extant amount of literature and the efforts of the NUAP are effective. With the

current study of the seven nurses, the mean average was 82% on the pretest and 86% on the posttest both scores being greater than the previous two studies.

### Conclusion

The staff did increase their pressure ulcer knowledge following an educational intervention. The results of this study did mirror the literature with a higher average for staff that had previous exposure to pressure ulcer education. According to the results the educational intervention did increase the knowledge of the nursing staff.

## CHAPTER 5

## DISCUSSION

Discussion

A quasi descriptive study was conducted on the effect of an educational intervention on the pressure ulcer knowledge of the rural nursing staff. A sample of seven nurses were tested, an educational intervention given, followed by post testing with use of the same instrument.

Demographics

The study included the nursing staff of the facility that participated in a pretest, educational intervention and posttest. All of the staff was females working in long-term care and no one had certifications.

Results

The first testing completed in the facility resulted in an average score of eighty-one percent. The literature reflected that when the tool was first used in 1995, the average score was the seventy-two percent, which was the goal to meet.

In the literature review, the researcher noted that the simple act of reading an article or attending a lecture resulted in a higher average score on the test. This study is consistent with the literature for those who read an article, but was not consistent for the nursing staff who attended a lecture. The type of lecture or presentation of lecture may be an area of future study.

Previous studies have showed that the BSN educated nurses tend to score higher than other levels of education, which was consistent with the pretest results of this study. Although the majority were diploma nurses, it is difficult to conclude any significance due to the small sample size and the skewed number of diploma nurses and the posttest results.

The nursing staff who sought information scored better on both the pretest and the posttest, which is consistent with other studies. Additionally the difference in scores could be attributed to the characteristic of being a life long learner.

The data revealed that primary staff knowledge deficits were related to those questions that focused on positioning, equipment, stages (including terms), dressing types, assessment and treatment. The importance of pressure relief and assessment was emphasized to the nursing staff. In future interventions, the frequency of the two hour time frame being outdated and the need to teach patients to shift their weight every 15 minutes would be an area to emphasize. The one to one educational intervention suggested by the literature was not applied due to time constraints, but some of the staff did initiate casual conversations with others and the researcher about the new information.

The implementation of education increased all of the nurses' scores but one. The initial average was eighty-one percent; the post education score was eighty-seven percent, an increase of six percent. After collating all participants', even those who were not given the pretest, scores after the implementation of education, the average score was eighty-six percent. Due to staff conflicts, not all of the staff could attend the in-services, even though the in-service was conducted three times. The three individuals not able to attend

the in-service were tasked to partake in the on-line learning tool: NDNQI Pressure Ulcer Training Program. The three individuals scored an average of ninety-one percent, which is better than the first Pieper Pressure Ulcer Test participants and the studied facility participants. This may indicate an advantage of technology, which allows the student to learn at their pace and review if needed. The use of the internet and other sources should be the next educational implementation in facilities. The convenience of doing education during the night shift or slow times increased the ability to comprehend. Being able to repeat or go back as often as desired also increases the usefulness of on-line training.

#### Content Scored Incorrectly on Pre-test

As per the table 5, one hundred percent of the study group missed the question about the need to teach patients to shift their weight every fifteen minutes, rather than a half an hour. Eighty-six percent of the study thought that heel protectors relieved pressure and that repositioning of patients every two hours continues to be the standard. Seventy-one percent of the nursing staff answered the Stage II question and the question about elevation of the head of the bed incorrectly.

After reviewing the incorrect responses, an educational intervention that included the staging of wounds, and the newer stage of “unstageable” was provided. Included in the educational intervention were risk assessments. The Braden scale was mentioned but because the risk assessment is in the computer documentation, the staff was informed and encouraged to explore the numbers at another time. Treatment of each stage of ulcers was reviewed with a specific treatment noted per stage. Included in the educational intervention was the importance of keeping the head of the bed at thirty degrees and

knees at thirty degrees. Next, content covered was the importance of keeping the heels elevated off the bed, even with the equipment in place. Discussion of the factors to document when charting wound description and treatment was offered. Specific treatments associated with wound stage was emphasized.

In the group that was only tested once if the participant had attended a lecture or read an article in the last year, the score was greater than the participant who did not read an article or attend a lecture. However, if the person sought information, there was no difference in the score, but the factor could be skewed related to the type of information sought.

The average score of the participants with only the intervention and test did achieve the goal of an average score of greater than 72 percent as the literature documented.

#### Content Scored Incorrectly on the Posttest

As per the table 6, the staff did not know that the patient had to shift every 15 minutes rather than 30 minutes. The nursing intervention of moving patients every two hours is a long-standing concept that has been followed for many years and changing long-term “habits” will take more effort and repeated education to consistently follow newer recommendations. Additionally, the staff thought that the act of using equipment such as heel protectors and vascular boots are enough preventative measures rather than an adjunct to floating the heels. The questions about Stages of pressure ulcers improved as five nurses missed the stage II definition question on the pretest but only one nurse missed this question on the posttest. There was no improvement regarding the use of

vascular boots between the two tests, the number of staff that marked the question incorrectly was unchanged. Overall, the nursing staff did increase their knowledge.

The data revealed the timing of the skin assessment was the most frequent missed content area. See table eleven for the specific missed questions on the posttest. The other frequently missed question was related to frequency of weight shifting to prevent pressure ulcers. Most of the staff did not notice that the question stated thirty minutes, yet the recommendation is fifteen minutes. Eighty-five percent of respondents also missed question number seventeen regarding the two-hour repositioning time recommendation. This practice has been in education so long that more effort to change this outdated intervention will be required before change is employed. The other needed education issue is the effectiveness of equipment, and how equipment is not the preventative intervention, but implementation of nursing care, such as repositioning is the solution to pressure ulcer prevention. The nursing staff also made the error that placement of heel protectors is enough preventative treatment rather than as an adjunct to floating the patient's heels. Forty-two percent of the respondents missed this question on the posttest.

This particular staff is not accustomed to using the Braden Scale, as the facility's computer documentation system includes its own scale. The staff was not familiar with the high versus low score associated with question number forty-three. Additionally, most of the staff has not encountered high humidity since they have not been out of Montana, thus do not know the treatment differences related to high humidity related to the area content for question number twenty-three.

After learning about massaging bony prominences and discussing eschar, a few of the nursing staff did not retain the new knowledge. In addition, there was a little

confusion about powders and creams helping to reduce friction but not to prevent skin breakdown, so the question was marked true when it was false.

### Observations

There has been an increase in discussion about pressure ulcers and implementation of a team effort since the education, demonstrated by an increase of questions and planning wound care. One nurse stated to the researcher that she does not feel that she has an adequate amount of knowledge regarding pressure ulcers.

An interesting aspect is that the lower scoring nurses have worked in facilities with wound care teams. The researcher could propose that without having to make the decisions about care but the simple act of following directions leads to less learning.

The increases of six percent on the posttests indicate that the staff knowledge had improved following the educational intervention. The goal of the study was to assess the effectiveness of an education intervention.

There was not statistical difference noted in relation to education, level of licensure, or years of experience. The online cohort staff had higher scores, which could lead one to explore the use of prepared interactive programs.

### Limitations

A limitation of the study was the small number of staff participation, as statistical significance could not be established. Further study recommendations could include education on the proper usage of adjunct equipment. Proper wound care involves more than just an application of equipment. Emphasize of the importance of pressure relief,

skin assessment and risk assessments. Specific information regarding time and nursing care, such as repositioning should be emphasized, and spelled out in the specific periods for better comprehension. Both on-line and personalized education did increase nurses' knowledge as evidenced by the increase of scores. Professionally prepared programs rather than a program developed by a staff expert may be more complete. Time constraints regarding delivery of education are an additional factor that reduces effectiveness.

### Conclusions

There is a need for nursing staff continuing education for nursing staff regarding pressure ulcers. In an environment of changing treatments and improved supplies, nursing staff should participate in identifying and then implementing evidence-based practice in wound care. With the technology available, the delivery of information to the rural areas has become easier, but nursing staff need encouragement to learn, explore and use proper equipment in the treatment of pressure ulcer prevention and care.

It is important to note that staff sought out additional knowledge in an effort to learn more about caring for pressure ulcers. The test was a challenge to them. They informed the instructor that they did not agree with the results and wanted to argue about a couple of points on the test. Another outcome of the study was the use of program delivery methods. In-service method can be inconvenient for staff and difficult to schedule. The use of an internet program or development of an internal facility program may produce better results. Use of a predesigned program would be more convenient for

the staff and instructor. The increased offering of education opportunities and less labor would be advantageous to all staff.

Replication of the study could involve short, more frequent sessions rather than a one-time intervention, or the use of different information delivery techniques. Another area to study nursing staff knowledge could be diabetic care and treatment related to numerous advances and new therapies. Additionally, it would be helpful to understand what methods are available to share, access, and implement in the rural setting.

In conclusion, the intervention of education did increase pressure ulcer knowledge, but not uniformly related to the different personalities and/or experience. The increase of knowledge in relation to clinical practice was not researched. Because the educational intervention increased knowledge, one could explore the need for education in other areas such as diabetes. Implementation of other forms of education, such as internet or computer designed programs could be explored for effectiveness in improving knowledge and clinical practice. The nursing profession can explore the newer forms of technology available, to promote new guidelines, protocols and treatment modalities. Additionally, the delivery of new techniques and treatments are more available to the rural setting through computers and internet access. Nevertheless, not all of the nursing staff has access to these at their residence so a facility could offer this service. The educational intervention did increase the nursing staff's knowledge of pressure ulcer care.

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APPENDICES

APPENDIX A:

PIEPER PRESSURE ULCER KNOWLEDGE TEST

## Pieper Pressure Ulcer Knowledge Test

Please answer each of the following by placing a check mark for each question:

- |   |               |                |                     |
|---|---------------|----------------|---------------------|
| 1. Stage I pressure ulcers are defined as nonblanchable erythema  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 2. Risk factors for development of pressure ulcers are immobility, incontinence, impaired nutrition, and altered level of consciousness.                                    | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 3. All individuals at risk for pressure ulcers should have a systematic skin inspection at least once a week.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 4. Hot water and soap may dry the skin and increase the risk for pressure ulcers  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 5. It is important to massage bony prominences  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 6. A stage III pressure ulcer is a partial thickness skin loss involving the epidermis and/or dermis.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 7. All individuals should be assessed on admission to a hospital for risk of pressure ulcer development   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 8. Corn starch, creams, transparent dressings (i.e., Tegaderm, Opsite), and hydrocolloid dressings (i.e., DuoDerm, Restore) do not protect against the effects of friction. | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 9. Stage IV pressure ulcers are a full thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone, or supporting structure.                  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 10. An adequate dietary intake of protein and calories should be maintained during illness.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 11. Persons confined to bed should be repositioned every 3 hours.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |

- |  |               |                |                     |
|--|---------------|----------------|---------------------|
| 12. A turning schedule should be written and placed at the bedside.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 13. Heel protectors relieve pressure on the heels.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 14. Donut devices/ring cushions help to prevent pressure ulcers  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 15. In a side lying position, a person should be at a 30-degree angle with the bed.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 16. The head of the bed should be maintained at the lowest degree of elevation (hopefully, no higher than a 30 degree angle) consistent with medical conditions. | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 17. A person who cannot move self should be repositioned while sitting in a chair every two hours.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 18. Persons who can be taught should shift their weight every 30 minutes while sitting in a chair.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 19. Chair-bound persons should be fitted for a chair cushion.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 20. Stage II pressure ulcers are a full thickness skin loss.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 21. The epidermis should remain clean and dry.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 22. The incidence of pressure ulcers is so high that the government has appointed a panel to study risk, prevention, and treatment.                              | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 23. A low humidity environment may predispose a person to pressure ulcers.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 24. To minimize the skin's exposure to moisture on incontinence, underpads should be used to absorb moisture.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 25. Rehabilitation should be instituted if consistent with the patient's overall goals of therapy.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |

26. Slough is yellow or creamy necrotic tissue on a wound bed.	True _____	False _____	Don't Know _____
27. Eschar is good for wound healing.	True _____	False _____	Don't Know _____
28. Bony prominences should not have direct contact with one another.	True _____	False _____	Don't Know _____
29. Every person assessed to be at risk for developing pressure ulcers should be placed on a pressure-reducing bed surface.	True _____	False _____	Don't Know _____
30. Undermining is the destruction that occurs under the skin.	True _____	False _____	Don't Know _____
31. Eschar is health tissue.	True _____	False _____	Don't Know _____
32. Blanching refers to whiteness when pressure is applied to a reddened area.	True _____	False _____	Don't Know _____
33. A pressure relieving surface reduces tissue interface pressure below capillary closing pressure.	True _____	False _____	Don't Know _____
34. Skin, macerated from moisture, tears more easily.	True _____	False _____	Don't Know _____
35. Pressure ulcers are sterile wounds.	True _____	False _____	Don't Know _____
36. A pressure ulcer scar will break down faster than unwounded skin.	True _____	False _____	Don't Know _____
37. A blister on the heel is nothing to worry about.	True _____	False _____	Don't Know _____
38. A good way to decrease pressure on the heels is to elevate them off the bed.	True _____	False _____	Don't Know _____
39. All care given to prevent or treat pressure ulcers must be documented.	True _____	False _____	Don't Know _____
40. Vascular boots protect the heels from pressure.	True _____	False _____	Don't Know _____
41. Shear is the force which occurs when the skin sticks to a surface and the body slides.	True _____	False _____	Don't Know _____

- |   |               |                |                     |
|---|---------------|----------------|---------------------|
| 42. Friction may occur when moving a person up in bed.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 43. A low Braden score is associated with increased pressure ulcer risk.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 44. The skin is the largest organ of the body.  | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 45. Stage II pressure ulcers may be extremely painful due to exposure of nerve endings.                         | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 46. For persons who have incontinence, skin cleaning should occur at the time of soiling and routine intervals. | True<br>_____ | False<br>_____ | Don't Know<br>_____ |
| 47. Educational programs may reduce the incidence of pressure ulcers.   | True<br>_____ | False<br>_____ | Don't Know<br>_____ |

Table 4. Comparison of Licensure/Years of Experience/Test Scores

RN or LPN	Years of experience	Pretest score	Posttest score
LPN	20	72	76
LPN	15	89	98
LPN	15	79	87
LPN	10	76	85
RN	20	83	87
RN	15	85	85
RN	20	81	91

Table 5. Questions Incorrect on the Pretest

How many incorrect responses	Question Number
7/7	18
6/7	13,17
5/7	15,6
4/7	
3/7	8,33,40,43
2/7	14,20,26,29
1/7	1,4,5,10,11,12,16,19,23,27,31,35,36,45

Questions that two or more staff answered incorrectly on the pretest

- 18 – staff did not know that the patient had to shift every 15 minutes
- 13- staff did not know that the heel protectors did not relieve the pressure but assisted
- 17 – Staff did not know that the newer recommendation is that the patient be repositioned more often than every two hours
- 15 – Staff did not know that when a patient is in the side-lying position that the head of the bed needs to be elevated 30 degrees
- 6 – Staff did not know the correct definition of a Stage II ulcer
- 8 – Staff did not know that cornstarch and other products will decrease friction.
- 33 – Staff did not know that the pressure relieving surfaces decreased tissue interface or did not understand what tissue interface involves
- 40 – Staff did not know that vascular boots do not protect the heel but must be used as an adjunct to nursing care such as repositioning
- 43 – Staff did not know that the low Braden score is associated with increased risk.

Table 6. Questions Incorrect on the Posttest

How many incorrect responses	Question number
7/7	18
6/7	17
3/7	13,40,45
2/7	5,15,23,43
1/7	3,6,8,12,14,16,20,26,27,29,33

Questions that two or more staff answered incorrectly on the post-test

- 18 staff did not know that the patient had to shift every 15 minutes
- 17 Staff did not know that the newer recommendation is that the patient be repositioned more often than every two hours
- 13 staff did not know that the heel protectors did not relieve the pressure but assisted
- 40 Staff did not know that vascular boots do not protect the heel but must be used as an adjunct to nursing care such as repositioning
- 45 – Staff did not realize that Stage II ulcers can be very painful

Table 7. Questions Divided by Subject

Prevention	Staging	Wound description	Treatment
2,3,7,10,11,12,15,16,17,18,22,23,24,28,29,34,36,41,42,43,46,47	1,6,9,20,32,37,45	26,27,30,31,35,44	4,5,8,13,14,19,21,25,33,38,39,40

APPENDIX B:

POWER POINT EDUCATIONAL INTERVENTION



## Pressure Ulcers

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## Pressure Ulcer Stages

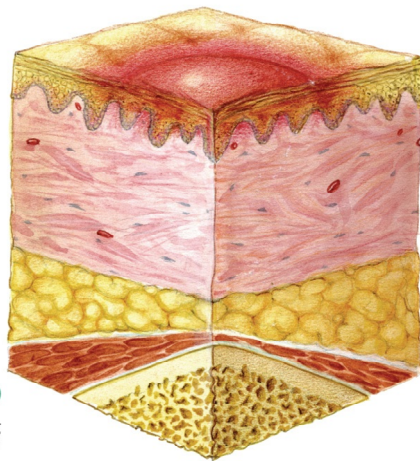
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- Stage I

## Pressure Ulcer Stages

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- Stage I
- Intact skin with non-blanchable redness of a localized area usually over a bony prominence.





## Pressure Ulcer Stages

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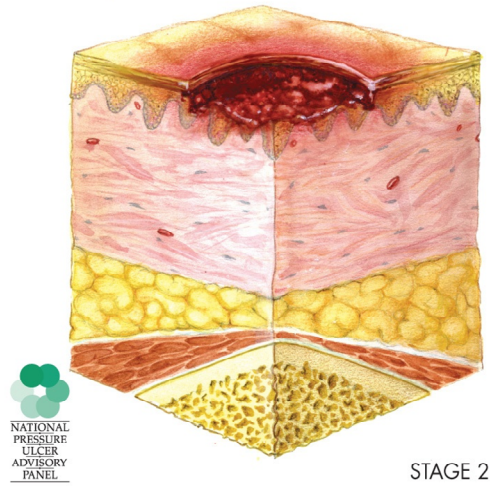
- Stage II



## Pressure Ulcer Stages

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- Stage II
- Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed without slough. May also present as an intact or open/ruptured serum-filled blister



## Pressure Ulcer Stages

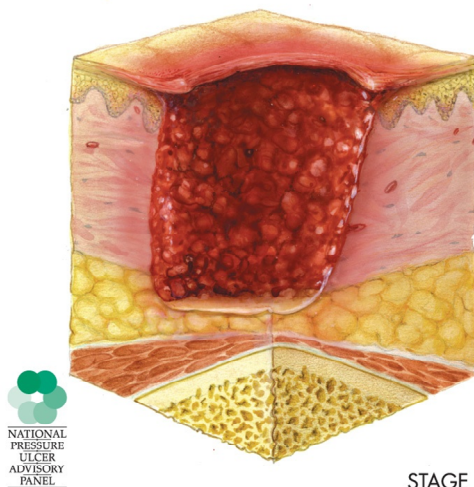
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- Stage III

## Pressure Ulcer Stages

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- Stage III
- Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.



STAGE 3



## Pressure Ulcer Stages

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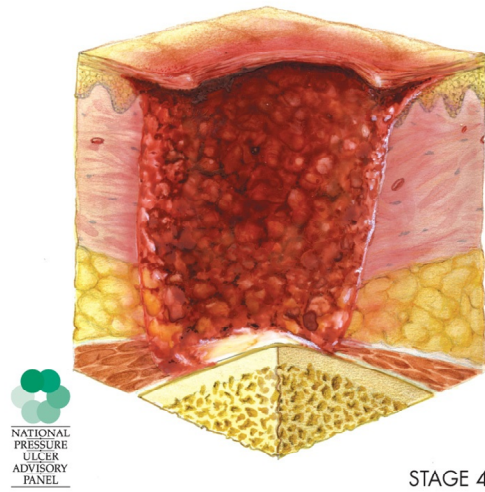
- Stage IV



## Pressure Ulcer Stages

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- Stage IV
- Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.



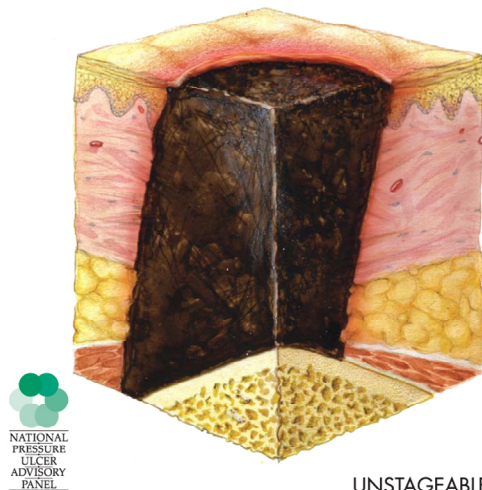
## Pressure Ulcer Stages

- Unstageable

## Pressure Ulcer Stages

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- Unstageable
- Full thickness tissue loss in which the base of the ulcer is covered by slough and/or eschar in the wound bed.





## Pressure Ulcer Stages

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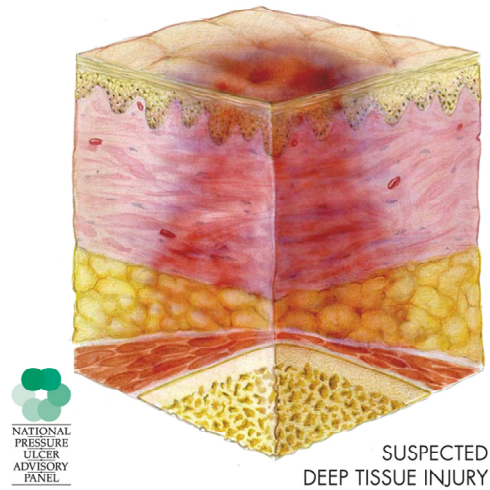
- Suspected Deep Tissue Injury



## Pressure Ulcer Stages

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- Suspected Deep Tissue Injury
- Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.



## Risk Assessment

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- Immobility
- Inactivity
- Nutritional factors
- Fecal and urinary incontinence
- Decreased sensory perception



## Risk assessment

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- Scales
- Check MDS



## Risk Assessment

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- Early intervention
- Identify those at risk
- Maintain and improve tissue tolerance to injury
- Protect against injury from pressure, friction and shear



## Treatment

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- Keep skin clean and well-hydrated
- Wash with warm water and mild cleansing
- Avoid excessive scrubbing
- Cleanse with each soiling
- Moisturizing agents
- Use lift sheets or lifts rather than sliding the patient



## Treatment

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- Pressure Reduction
- Turn at least every two hours
- “Rule of 30” which means head of bed elevated 30 degrees or less, and the body is placed in a 30 degree laterally inclined position when on their side. (hips and shoulders are tilted 30 degrees from supine)



## Heels

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- Heel protectors and boots are helpful but the heels must be elevated off the bed.



## What to do

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- More frequent repositioning
- Use of topical skin management and/or dressings
- Use pressure reducing devices



## Document

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- Risk assessment
- Skin Evaluation
- Therapies designed to maintain intact skin
- Patient response to alterations in therapy
- Rational for the alterations
- Outcome of the plan



## Algorhytm

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- Skin tear
- Moisten, approximate edges and apply dressing
- If moist use an absorptive dressing



## Algorhythm

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- Stage I
- Relieve pressure
- Protect skin with Vaseline or A & D
- If no change in week use Zinc Oxide



## Algorhythm

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- Stage II
- Irrigate with Saline
- Use Tegaderm or Aquacel if draining
- Get orders for antibiotic treatment with s/sx of infection.



## Algorhythm

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- Stage III
- Get consult from provider and potentially from wound clinic

APPENDIX C:

IRB APPROVAL FORM



**INSTITUTIONAL REVIEW BOARD**  
**For the Protection of Human Subjects**  
**FWA 00000165**

960 Technology Blvd. Room 127  
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 406-994-4707  
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*Administrator:*  
 Cheryl Johnson  
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**MEMORANDUM**  
 .....

**TO:** Cynthia Forseth & Karen Zulkowski

**FROM:** Mark Quinn, Ph.D. Chair *Mark Quinn*  
 Institutional Review Board for the Protection of Human Subjects

**DATE:** October 6, 2010

**SUBJECT:** *The Effect of an Educational Intervention on Facility Staff Knowledge Regarding Pressure Ulcer Care [CF100610-EX]*

The above research, described in your submission of October 5, 2010, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal Regulations, Part 46, section 101. The specific paragraph which applies to your research is:

- (b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- (b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.
- (b)(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
- (b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.
- (b)(5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.
- (b)(6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA, or approved by the EPA, or the Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.