A jump in the pressure ulcer prevalence rate on a general medical-surgical unit led to educational in-services and the development of a pocket guide. Prevalence on the unit dropped to 0% and remained at that level for over a year.

A busy medical-surgical unit at Penn Presbyterian knew Miss Betty as a well cared for, but ill, 80-year-old woman. Her dementia and heart disease had rapidly progressed in the past year, leading to multiple hospital admissions. As always, Miss Betty was welcomed back by staff with huge smiles. Two days after Betty’s admission, the Skin Care Champion was conducting wound prevalence audits and noticed a small deep tissue injury (DTI) on her left heel. The nurses and her family were stunned because they believed that they had provided immaculate care for Miss Betty. Despite being bed-bound and incontinent, Miss Betty had never before developed a pressure ulcer. Neither the nurses nor the family were sure of how to prevent pressure ulcers on the heels. During prevalence audits over the next two months, three additional heel ulcers were discovered and additional pressure ulcers developed on less common areas, such as behind the ears and calves. Prevalence rates of

continued on page 2
pressure ulcers on 4 South had previously been 0%, but in a four-month period, they had increased to 4%.

Penn Presbyterian has a prevention protocol for pressure ulcers in place that was implemented in spring 2008 as one of the initiatives described in “Development of a Pressure Ulcer Program Across a University Health System” by Carson, Emmons, Falone, and Preston (2012). The prevention protocol is outlined in the “SKIN CARE” bundle (copyrighted, The Trustees of University of Pennsylvania) in which:

Each letter of the acronym represents an area that aids in the prevention of pressure ulcers: Support surfaces, Keep repositioning, Incontinence care, Nutrition and hydration, Careful lifting (ceiling lifts), Assess risk and skin, Reduce head of bed 30 degrees or less, and Elevate heels. (Carson et al., 2012, p. 23)

A skin care champion model was also initiated by the collaborative. Staff nurses from each floor were selected to sit on the Skin Integrity Committee based on their interest and upon completion of additional competencies. The unit champions track prevalence on the second Tuesday of each month. The Skin Champion also:

serve(s) as a resource for staff on prevention interventions for patients at risk for pressure ulcers and for management of uncomplicated stage I and II pressure ulcers, moisture damage, and skin tears; increase(s) staff awareness and knowledge on resources such as the Skin Care EBP Web site and SKIN CARE bundle; and “champion(s)” initiatives related to optimizing skin care outcomes and documentation. (Carson et al., 2012, p. 25)

The initiation of the pressure ulcer prevention bundle and the implementation of skin care champions on each unit helped the clinical nurses decrease the instances of pressure ulcers to 0% for two years from October 2008 through October 2010. A sudden jump in the prevalence rate two and a half years after the implantation of the pressure ulcer bundle caught the attention of the Skin Integrity Champion on the unit, leading to a review of system and unit barriers that staff encountered in adhering to the protocol. This eventually led to educational in-services and the development of a resource tool for staff.

Background

Pressure ulcers and their complications are well known in the acute care setting. The National Pressure Ulcer Advisory Panel (NPUAP) defines a pressure ulcer as a site of “injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction” (NPUAP, 2015). An unidentified DTI can significantly change a patient’s original plan of care, as it did for Miss Betty. Pressure ulcers can lead to pain, loss of function, extended hospital stays, and increased cost (Ayello & Lyder, 2007).

The Institute of Medicine published a report in 1999, To Err is Human, which deemed pressure ulcers a medical error. This report was one factor that inspired a transition of hospital reimbursement for hospital-acquired conditions including pressure ulcers. Medicare no longer reimburses for stage III and IV pressure ulcers that develop in the hospital. A 2012 estimate of a cost for treating a stage III or IV pressure ulcer is $2,400 (Kandilov, Dalton, & Coomer, 2012).

Due to the impact on patients and cost to hospitals, it is imperative that nursing care focuses on reducing pressure ulcers. Most pressure ulcers can be prevented from developing in the hospital by vigilant skin care provided by nurses (Black et al., 2011). Proficient nursing care includes careful monitoring,
documentation, and recognizing risk factors and changes in skin. Nurses should apply knowledge regarding staging and initiate prevention protocols as directed by hospital policy (Black et al., 2011). Empowering clinical nurses with education regarding skin and risk assessment and implementing prevention and treatment protocols in a timely fashion have been linked to decreased incidences and costs of pressure ulcers (Carson et al., 2012; Lacey, Olney, & Cox, 2012). Furthermore, it has been demonstrated that when clinical nurses develop a project and tool specific for their unit, it results in successful implementation and lasting results (Lacey et al., 2012).

Identifying the Problem
The location and severity of Miss Betty’s pressure ulcer alerted the Skin Care Champion of the need for additional nursing education related to skin care and prevention of pressure ulcers. Over a four-month period that began with the discovery of Miss Betty’s pressure ulcer, prevalence increased from 0% to 4%. To address this significant change, the Skin Care Champion began tracking the location of the pressure ulcers, in addition to the incidence and stage. The data indicated a majority of pressure ulcers were occurring on heels. Furthermore, a majority of these ulcers could be classified as a DTI. The unit’s overall prevalence from October 2010 until March 2011 was 3.3%. However, for the same period, prevalence for pressure ulcers on the sacrum was 0%. Nurses recognized the importance of checking the sacral area and initiated the prevention protocol in relation to relieving pressure from the sacral area. Nurses consistently provided diligent nursing care of the sacrum, including sacral skin surveillance every shift, turning/repositioning to prevent sacral pressure, and moisture management of the groin and buttocks. The pressure ulcers identified during prevalence were located on areas less associated with pressure ulcers including the heels, thighs, hips, ears, and even calves secondary to a device. Often, nurses did not recognize the other areas of pressure or initiate prevention protocols in relation to those areas.

Using the data collected from prevalence, the Certified Wound Ostomy Nurse (CWON) and the Skin Care Champion on the unit identified a knowledge deficit regarding the assessment of alternative pressure points, pressure secondary to devices such as sequential compression devices and heel boots, and prevention protocols for alternative pressure points and devices. An initial in-service began by focusing on these topics to address the knowledge deficits. During the in-service, it became apparent that the problem was multi-faceted as nurses relayed their concerns with skin care. The staff confessed that they felt uncomfortable staging pressure ulcers. Furthermore, most nurses were comfortable with placing a wound care consult but often felt intimidated by having to initiate a plan of care independently. They relayed a fear of “treating” wounds without the recommendations of the CWON. The staff also found it overwhelming to keep track of the different beds, heel boots, and specialty creams to utilize in the presence of skin breakdown.

In reviewing these staff concerns, it became apparent that a tool was needed for staff to keep track of this information. This information is available on the intranet to all nurses. However, they often did not access the intranet because they believed that this took more time than they had to spare or because it was too difficult to access. The Skin Care Champion felt responsible for addressing this and developed a pocket guide in an effort to provide an easily accessible resource. Nurses typically prefer to have references handy without the added step of searching for the resource. A pocket guide empowers nurses to make an evidence-based decision in a timely fashion.

Creating a Resource
In creating the Skin Care Pocket Guide, several focus areas were established. The staff was most uncomfortable with staging. Most nurses did not realize that redness was the first sign of damage. The terms blanchable versus non-
Decentralization of Transporters to Increase Staff Satisfaction and Productivity

Judith Kay Fogg

Today's health care environment requires optimal utilization of staff, increased productivity, high staff satisfaction, and reduction of turnover. Historically, transporters at Inspira Medical Center Elmer were centralized in a separate department with frequent episodes of downtime noted and under utilization of resources. Reassigning transporters to each unit provides better utilization of down time, increased productivity, and increased staff and patient satisfaction.

At Inspira Medical Center Elmer, a Magnet® recognized acute care hospital, our mission is to provide quality health care services while contributing to the health and well-being of our patients. Today's health care environment requires nursing leadership to utilize all staff optimally, to increase productivity while maintaining staff and patient satisfaction, and to decrease staff turnover while reducing cost. It was determined that the transportation department needed to be reorganized in order to improve efficiency, satisfaction, teamwork, and outcomes consistent with current literature (Harmon, Sey, Hiner, Faron, & MacAdam, 2010; Kalisch, Lee, & Rochman, 2010; Ward, 2013).

The Problem

Traditionally, transporters in our acute care hospital were centrally located, carried beepers, spent down time in the radiology department, and reported to the Emergency Department manager. Transporters responded as needed to the nursing units, transporting patients to and from the ancillary departments and operating rooms while moving patients from the emergency department to the inpatient units. The leadership team realized that there were frequent periods of down time between transports. In addition, the beeper system frequently delayed transports and was responsible for miscommunication. The transporters reported low job satisfaction and high levels of frustration.

Exploring Solutions

A work productivity team was established, which included the transporters, clinical nurses, nurse managers, the Clinical Outcomes Manager, and the Vice President of Patient Care Services, to discuss options for redesigning the transporter’s role. The objectives of the productivity team included consideration of patient needs and patient satisfaction, patient and staff safety, hospital logistics, transporter reporting structure, resource availability, improved communication, and improved productivity.

The first step in the process was to determine what factors decreased the transporters’ level of job satisfaction. Transporters reported that they felt: underutilized, unappreciated, isolated from the rest of the hospital staff (lacking a sense of belonging to a unit), no forum to express their ideas and concerns, no advocate to represent them, and inconsistencies in receiving communication in a timely manner. The work productivity team sought ideas for resolution of these issues from the transporters themselves as well as all members of the team. During the meeting, it became evident that the transporters wanted to identify with a unit and that the nursing teams would welcome them within their work group. According to Fletcher (2008), one of the benefits of belonging to a team is improved morale of staff and increased satisfaction with team member’s roles. The transporters suggested that they could increase productivity during downtime by assisting with patient transfers, ambulating patients, and rounding to prevent patient falls.
Members of the team suggested other tasks too, such as obtaining and maintaining equipment, setting patients up for meals, getting rooms ready for admissions, filling water pitchers, and answering phones and call bells to increase productivity. It became obvious to the team that in order to implement these changes, the transporters would need to be decentralized and assigned to a specific unit; this unit would become their home base, fostering involvement within the team and engagement within their job. The goal was to have them function as a member of a specific team, increasing the overall productivity of the unit, while also completing their transporter tasks. An outcome objective was to enhance the job satisfaction of all members involved. The leadership team recognized that education would also be needed before making these duties part of the transporter’s job description. The clinical outcomes manager volunteered to provide training on hourly rounding, patient satisfaction, catheter-related urinary tract infection prevention, fall prevention, hand washing, quality indicators, and hospital-acquired infections.

Implementing the Plan

The next step in the process was to reassign specific transporters to each inpatient unit and change their reporting structure. It was determined that each transporter would report to the unit manager on their assigned unit. They would be expected to attend staff meetings and unit-based practice council meetings regularly, giving them a sense of belonging to that team. This would also provide a place for them to present new ideas as well as concerns and give them the opportunity to become engaged members of that work group. Communication at staff meetings, team huddles, and emails from the unit manager would enhance consistent and timely messages. The unit manager would be accessible and available to advocate for them as needed. The unit managers assured them of open door access at all times.

The third step in the process was to improve the current communication system. Breakdowns in communication can adversely affect patient outcomes, can be the direct cause of adverse events, and can interfere with effective team function and productivity (Twaddle, 2012). Using the current beeper system frequently delayed communication and transports and led to staff miscommunication, causing dissatisfaction on the part of other departments, patients, and transport staff. With administrative support, cellular phones were purchased for the transport staff, discontinuing use of beepers completely. Training of the transporters for their new role was completed in a four-hour class taught by the clinical outcomes manager. Cell phones were obtained and their utilization was implemented immediately.

Prior to decentralization, all members of the transport staff completed a three-question paper survey rating satisfaction with their current role. The clinical nurses, nurse aides, assistant nurse managers, and unit secretaries completed a second paper survey to determine their satisfaction with the current transporter process. A third and final paper survey was provided to all patients present on the units, on two specific days, allowing the patients to rate their satisfaction with our current transport process. The clinical outcomes manager and unit manager developed the surveys utilizing a Likert scale to assess the level of satisfaction of each group with the transport process.

Results

When decentralized transporters were implemented on the units, everyone involved noted immediate rewards. The rewards included increased transporter satisfaction as a result of belonging to a team as well as having access to their manager on a regular basis. The transporters voiced their satisfaction as a result of being kept up-to-date on staff communication, which resulted from attending staff meetings and participating in unit-based practice initiatives. Some expressed their contentment with the decentralization because it resulted in a feeling of being needed, making a notable difference to fellow employees and patients. The transporters received positive feedback both verbally and in the form of sunshine awards from staff members on the unit.

Three weeks post implementation, the transporters, clinical nurses, nurse aides, unit secretaries, assistant nurse managers, and patients were re-surveyed with the same three-question paper surveys. The pre-implementation and post-implementation surveys were compared. Transporter overall satisfaction increased from 51% to 89%, nursing staff satisfaction with the transporters increased from 55% to 92%, and patient satisfaction increased from 90% to 96%. Transporters stated their increased satisfaction was due to improved communication with all departments as a result of the cell phone usage. The transporters also expressed that belonging to a specific unit and team improved their work relationships and engagement. Nursing staff expressed the value of increased availability of assistance when transferring and ambulating patients. Other clinical nurse satisfiers included improved availability of equipment, assistance with patient safety rounding, and assistance with orthopedic patients and equipment needed for their care. In addition, the nurses voiced their appreciation for assistance with refilling water pitchers prior to medication passes, setting patients up for meals, and advance room preparation for new admissions, including trapeze equipment when needed.

The unit managers also noted improvements in equipment tracking, cleaning, and availability due to the transporters’ diligence. Administrative satisfaction with the project was directly related to increased staff and patient satisfaction, better utilization of staff, increased productivity, increased patient safety due to additional assistance with transfers and ambulation, and improved communication overall.

The cost for the project included an additional four-hour training for the transport staff. Additionally, the difference between the cost of beepers and the new cell phones per transporter was $27.81 per month.

Conclusion

The transporter decentralization was a success from all viewpoints. Two of our transporters have been named as
hospital employee of the quarter and team member of the month for their individual unit. The transports have been involved in the unit-based practice council, the transforming care at the bedside team, and one recently accepted a position on our new employee patient connection team. They frequently receive accolades from our patients as well as sunshine awards from our staff. It is evident that becoming an empowered member of the unit-based interdisciplinary team increased transporter satisfaction, which equates to increased transporter engagement, ultimately leading to increased patient and staff satisfaction. It is our goal that other medical-surgical nursing units experiencing similar transportation frustrations learn from our successful implementation of a new process to improve collaboration, teamwork, and outcomes.

Skin Care Pocket Guide

continued from page 3

Blanchable were commonly mixed up. Therefore, a small reference table of staging was necessary to include on the card. Staff also related concerns about differentiating between excoriation and pressure ulcers. The Skin Care Champion believed the staff should be able to recognize the difference between the two, considering the significant difference in management of a pressure ulcer versus excoriation. The Wound Care Specialist is to be consulted for pressure ulcers but expects clinical nurses to manage excoriation independently. Lastly, the protocols determined by the Skin Integrity Committee for both specialty beds and heel boots were included so that nurses would feel empowered to choose the appropriate bed and/or heel boot based on the individual patient’s need. The Skin Care Pocket Guide is a one-sided 3x5 laminated card. All of the information included on the card was obtained from the Skin Integrity Committee website on the intranet of Penn Presbyterian Medical Center and can be reviewed in Figure 1.

Upon completion of the Guide, it was distributed to the staff and reviewed during an in-service. In addition to reviewing the card, the protocol on skin assessments was reviewed. All skin, particularly pressure points and under devices, are to be assessed on admission and once a shift. Furthermore, nurses were to complete a Braden score on admission and once a shift in identifying a patient at risk for developing a pressure ulcer as part of the skin assessment. Pressure ulcer staging was reviewed to assist nurses in identifying and staging pressure ulcers. The Skin Care Pocket Guide can be utilized to support a nurse in identifying skin breakdown as either a pressure ulcer or excoriation, docu-

References

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Figure 1.

Replication of the Skin Care Pocket Guide Distributed to Nurses on the Unit

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Moisture Associated Skin Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related to pressure or shear</td>
<td>Moisture must be present</td>
</tr>
<tr>
<td>Usually over bony prominence</td>
<td>May be over bony prominence, in skin folds, or extend up thighs</td>
</tr>
<tr>
<td>Red to bluesh/purple</td>
<td>Red or bright red</td>
</tr>
<tr>
<td>Circular or regular shape</td>
<td>Diffuse, different spots</td>
</tr>
<tr>
<td>Distinct edges</td>
<td>Irregular edges</td>
</tr>
<tr>
<td>Persistent redness surrounding</td>
<td>Pink or white surrounding skin from maceration</td>
</tr>
<tr>
<td>Pain and itching</td>
<td>pain and itching</td>
</tr>
</tbody>
</table>

Moisture Ass Skin Damage: redness or partial skin loss related to moisture damage.

Heel Algorithm: Assessment:
- everyone on admission!
- every shift there after
White Heel Boots:
- sensory perception < or = to 2
- mobility sub-score of < or = to 2
- Stage I on heels
- recent orthopedic surgery
Stage Boots:
- Stage II or greater
- DTI
- Acute foot drop
- positional issues or edema that make white boots ineffective

Reminders:
- Measure all wounds on admission, upon discovery, Q thurs, and upon discharge

Source: Adapted from Carson et al., 2012. Retrieved from the University of Pennsylvania Health System’s intranet.

Quick Staging Reference

Stage 1: Intact skin with well defined non-blanched redness (does not turn white).

Stage 2: shallow open ulcer with a red/pink wound bed, no slough; Or intact serum blister.

Stage 3: FT tissue loss; may see subcutaneous fat. May have slough, undermining, or tunneling.

Stage 4: Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Usually undermining and tunneling.

UTD: FT tissue loss where the base of the ulcer is covered by slough and/or eschar.

DTI: Purple/maroon area of intact skin or Blood-filled blister

*areas that are not pressure related should be described using Partial or full thickness

Bed Algorithm
Phone numbers:
- 3442
  - contact PCC or company directly
HI-Air Bed:
- order mattress replacement if no atmosphere mattress
Banatric Surfaces:
- request low airloss mattress replacement surface with EVERY bed request
Stage IV Mattress:
- Braden <18 AND moisture score of 1 or 2
- multiple ulcers on several turning surfaces
- considerable stage III, IV, or DTI
- ultrasorb pads on bed & turn comfort adjust off
Clinitron:
- multiple stage III, IV, or DTI
- new flap or truncal graft
- ultrasorb pads
- Call 9442 to return bed upon pt discharge

Figure 1.

Source: Adapted from Carson et al., 2012. Retrieved from the University of Pennsylvania Health System’s intranet.
ment the correct staging of a pressure ulcer, and initiate the appropriate bed and heel protocol based on a patient’s risk.

Outcomes

The staff reported that information in the Skin Care Pocket Guide is very useful and is a simple resource to assist in the development of an individualized care plan. Over the subsequent few months, the prevalence on 4 South dropped significantly to 0%. Furthermore, the incidence of unit-acquired pressure ulcers remained at that level for over a year. The unit is continuing to report low prevalence rates.

Discussion

The negative impact of pressure ulcers has been clearly documented. Pressure ulcers can increase cost, length of hospital stay, and contribute to pain and suffering for the patient (Ayello & Lyder, 2007). Hospitals are now responsible for covering the cost of stage III and IV pressure ulcers that develop during a patient’s stay. Therefore, it is financially prudent for hospitals to identify pressure ulcers when patients are admitted and to reduce the incidence of pressure ulcers that develop in the hospital. Nurses are a key component to decreasing the incidence of pressure ulcers.

While Penn Presbyterian had a prevention protocol in place, their medical-surgical unit discovered barriers to applying this protocol to its fullest potential. Pressure ulcer prevalence increased after two years of this protocol being implemented. Many of the pressure ulcers occurred in areas other than the sacrum or secondary to pressure from devices. This is consistent with a retrospective study that determined 36% of their pressure ulcers occurred on areas considered to be “low risk” (Alderden, Whitney, Taylor, & Zaratkiewicz, 2011). Furthermore, nurses did not completely feel comfortable with staging, leading to decreased recognition and documentation of pressure ulcers on admission. With this in mind, our aims at reducing pressure ulcers included increased education on alternative pressure points, pressure related to devices, identifying pressure ulcers, and accuracy in staging.

Prevention implemented by nursing staff has consistently demonstrated that it lowers the rate of pressure ulcers. However, if we want nurses to succeed in incorporating prevention protocols and appropriate skin care into each patient’s care plan, we must continue to reeducate and reassess how to provide easily accessible resources to nurses. Simple in-service and a reference card proved to be an inexpensive way to support nurses in reducing pressure ulcer prevalence.

With changes in health care migrating toward a more digital system, it may prove beneficial to place the card on the hospital’s intranet. Cards are easily misplaced and lost. However, all of this information is already available on the intranet in a different format. Simply placing the card on the intranet would defeat the purpose of making the information more readily available to nurses. Another solution would be to make a larger copy that could be placed in each patient room. Graphic images may prove to be disturbing to patients and their family members, but it could also serve as an educational tool for them as well. After all, empowering families and patients also helps to reduce pressure ulcer incidence (Carson et al., 2012).

One challenge in reducing long-term prevalence rates depends upon staff turnover. For two years, the prevalence rate on 4 South remained at zero. However, a heel ulcer was again discovered on prevalence soon after. Since the initial in-service and distribution of the Pocket Guide, significant nurse turnover has occurred on the unit. Cards have not been redistributed. The current Skin Integrity Champion recognized a need for another in-service.

Another challenge in reducing pressure ulcer prevalence is related to the increased acuity of patients across all health care systems. Patients are having increasing co-morbidities upon admission to the hospital, which increases their overall acuity. Increased acuity has been demonstrated as an increased risk factor for developing a pressure ulcer (Alderden et al., 2011). While the principles behind prevention may remain the same, protocols for prevention of pressure ulcers may need to change to compensate for this increased acuity. For instance, it is a standard of care for Penn Presbyterian to provide a low-air-loss mattress for all patients in the hospital to address increased acuity. With changes in protocols, nurses will need continued education and updated resources.
Overall, prevention of pressure ulcers is a high priority and multiple methods can help reduce the incidence of pressure ulcers. Nurses play an important role in reducing pressure ulcers by recognizing a patient’s risk, identifying a pressure ulcer, and initiating the appropriate prevention and treatment protocols. Nurses need to be supported and empowered through increased education and resource tools in both big and pocket-sized ways.

References

Katie M. Stonelake, BSN, RN, CCRN, was a Staff Nurse, Medical-Surgical Unit, 4 South, University of Pennsylvania Health System, Penn Presbyterian Medical Center, Philadelphia, PA, at the time she developed the Skin Integrity Pocket Guide and when this article was written. She is now in the MICU and continues to serve as a Skin Champion for the Skin Integrity Committee.

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Venous Thromboembolic (VTE) Prophylaxis: Part II

Challenges in the Treatment of Acute Bleeding Events and Development of New Thrombin and Factor Xa Inhibitor Antidotes

Recap of Part I

An update published last year in MedSurg Matters! (Goldstein, 2014) discussed the need for precaution with use of non-steroidal anti-inflammatory drugs (NSAIDs) with regard to increased bleeding risks associated with the new oral Factor IIa and Xa anticoagulant medications. A related issue regarding current venous thromboembolic prophylaxis (VTE) is the need for antidotes for these same inhibitors, which were listed in Table 1 in Part I (Goldstein, 2014). When the new oral anticoagulants (NOACs) were first developed, there were no antidotes available that could slow or stop unanticipated bleeding events. Hence, the race among pharmaceutical manufacturers to find such antidotes with few drug interactions, rapid reversal potential, and minimal adverse effects has accelerated during the past 18 months, and especially after new reports of increased bleeding risks with dabigatran (Pradaxa®) highlighted in a series of articles in the British Medical Journal over the last six months (Charlton & Redberg, 2014; Cohen, 2014a, 2014b; McCarthy, 2014; Moore, Cohen, & Mattson, 2014). Since the publication of the first part of this series, the Federal Drug Administration (FDA) has approved (October 31, 2014) an additional Factor Xa inhibitor for VTE prophylaxis, Edoxaban (Savaysa™). In addition, in the prior paper (Goldstein, 2014), dabigatran was incorrectly labeled as a primary Factor Xa inhibitor, while it is actually a primary Factor IIa inhibitor.

Since 1960, warfarin (Coumadin®) and other Vitamin K antagonists (VKAs) have been the standard of care for VTE in orthopedic surgery patients at risk for VTE events and those suffering from atrial fibrillation at risk for embolus formation in large heart chambers. Although effective in anticoagulation for patients at risk of deep vein thrombosis (DVT) and pulmonary embolus (PE), warfarin and other VKAs have limitations. Warfarin has a slow onset of action, requiring overlapping therapy with a rapidly acting parenteral anticoagulant risk (Yeh, Frederenburgh, & Weitz, 2012). In addition, warfarin dosing is problematic because blood levels will vary between individuals with identical doses due to dietary variations (amount of Vitamin K intake), genetic differences, and multiple drug interactions due to polypharmacy. Hence frequent coagulation monitoring is needed to ensure therapeutic anticoagulant effects are achieved and excessive anticoagulation is avoided (Ansell, 2013). However, if anticoagulation effects are too extreme, Vitamin K (Mephyton®) is an easily administered antidote to reduce the International Normalized Ratio (INR) and Prothrombin Time (PT) to expected therapeutic levels (PT=2.0-3.0 in patients without mechanical valve replacements; PT=2.5-3.5 in patients with mechanical valve replacements) (Alikhan, 2014).

Many studies evaluating warfarin effectiveness have shown that the level of anticoagulation is frequently outside the therapeutic range, thereby placing patients at risk for thrombosis or bleeding. These limitations were the impetus for development of the new Factor Xa and thrombin-inhibiting oral anticoagulants, which are less affected by dietary intake, have fewer drug-drug interactions, and have a wide therapeutic index, allowing for administration in fixed doses without the need for routine coagulation monitoring (Alikhan, 2014; Connolly et al., 2009; Giugliano et al., 2013; Granger et al., 2011; Kim, Hein, & Wigle, 2009; Patel et al., 2011). To support the move to these newer medications, Dogliotti, Paolasso, and Giugliano (2013) completed a meta-analysis of all available studies through October 2012, comparing the NOACs to warfarin in terms of incidence of embolic events, myocardial infarctions, and strokes, as well as the frequencies of bleeds. Results from five studies (Dogliotti et al., 2013) of more than 5,000 patients showed overall incidence of stroke and embolic events were significantly reduced among Factor Xa inhibitors compared to warfarin; thrombin inhibitors ( dabigatran) also reduced embolic events, but at a less statistically significant level. In addition, overall mortality rates were also improved to a greater extent with Factor Xa inhibitor medications. Finally, the most significant improvement in outcomes for both thrombin inhibitors and Factor Xa inhibitors was related to the reduction of hemorrhagic strokes relative to warfarin.

Bleeding Events and Antidotes Under Study for NOACs

FDA and Clinical Trials

The FDA, in collaboration with the National Institutes of Health (NIH), assists in the design, approval, and analysis of studies to test the safety, efficacy, and interactions of all new medications seeking approval for sale in the United States, in a graded, four-phase manner moving from small test groups in phase 1 to quality improvement and long-term efficacy of the drug in phase 4 (NIH, 2014a, 2014b). At present, there are four separate active studies investigating antidotes for the NOACs. These are detailed in Table 3, which lists the NOACs, suggested daily oral dosing, and the current compounds under investigation as possible antidotes or reversal...
agents; two studies are Phase I trials and two studies are Phase III trials.

Treatment of anticoagulant-mediated, severe bleeding events presents a challenge for researchers in that large, well-controlled studies of any reversal are unlikely. Hence, at least one author/reviewer suggested that the FDA might never be able to fully and adequately study the safety and efficacy of any of the reversal agents currently under investigation (Stiles, 2013). Based upon review of current literature, it does not appear likely that the FDA will approve any new NOAC antidote prior to 2016. Table 4 lists all antidote compounds under study and their manufacturers.

### Antidotes Under Study for Dabigatran (Pradaxa®)

Pradaxa® was first approved and licensed by the FDA in 2010 as an oral, direct Factor IIa inhibiting anticoagulant after just one Phase III FDA trial (Boehringer-Ingelheim, 2010; Cohen, 2014a, 2014b; Connolly et al., 2009).

New analyses and an in-depth investigation conducted by the *British Medical Journal* (2014) have illustrated a number of suspected flaws in the FDA approval process for Pradaxa. The essential problems discovered are as follows: 1) the manner in which the open labeled studies using dabigatran (Pradaxa) were conducted essentially unblinded reviewers of the study and allowed for the possibility of reviewer bias to minimize the significance of adverse events and favor dabigatran over warfarin; 2) the pharmacokinetics of the drug can vary widely, which can cause a five-fold variation of plasma concentrations while the dose remains constant; 3) because 80% of the medication is metabolized and excreted through the kidneys, the risk for increased plasma levels and increased bleeding events is far greater when renal function is compromised, especially when creatinine clearance is less than 30; and 4) internal memos and emails by company employees suggested that because of the variable blood plasma levels and issues related to renal function, levels of the drug might need to be monitored on a regular basis for safety issues, contrary to the marketing claims of the company, which indicated no regular monitoring was needed. If monitoring were needed, then the major advantage of dabigatran over warfarin would be removed, significantly affecting sales of the drug (Cohen, 2014a, 2014b; Kmitowicz, 2014; McCarthy, 2014; Moore et al., 2014). A re-analysis of the available data for dabigatran also identified 81 new events, including one stroke, one systemic embolism, and 69 major hemorrhages (Charlton & Redberg, 2014). In May 2014, Boehringer-Ingelheim announced that it had settled 4,000 cases for $650

### Table 3.

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Trade Name</th>
<th>Suggested Oral Dosage</th>
<th>NIH/FDA Monitored Studies for Antidotes/Reversal Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixaban</td>
<td>Eliquis®</td>
<td>1. Strengths: 2.5 mg, 5 mg 2. NVAF: 5 mg BID 3. DVT/PE prophylaxis: 2.5 mg BID 4. 2.5 mg BID: if Age &gt;80 and Body Weight &lt; 60 kg or Serum creatinine ≥ 1.5 mg/dL</td>
<td>Drug: Cofact® (4-Factor PCC) Drug: Beriplex® P/N (4-Factor PCC) Clinical Trial#: NCT02074358</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Start Date: Feb. 2014 PHASE I End date: May 2014 Website: <a href="http://www.ClinicalTrials.gov">www.ClinicalTrials.gov</a></td>
</tr>
<tr>
<td>Dabigatran</td>
<td>Pradaxa®</td>
<td>1. 150 mg BID 2. *Administer Only if CrCl &gt; 30 3. Wait for INR &lt; 2.0 in patients discontinued from Warfarin.</td>
<td>Drug Name: Idarucizumab Clinical Trial#: NCT02104947 Start Date: May 2014 PHASE III</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>End date: July 2017 Website: <a href="http://www.ClinicalTrials.gov">www.ClinicalTrials.gov</a></td>
</tr>
<tr>
<td>Edoxaban</td>
<td>Savaysa®</td>
<td>1. 60 mg once daily (No renal dosing guidelines)</td>
<td>Drug Name: Aripazine (Ciraparantag) Clinical Trial#: NCT01826266</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Start Date: July 2013 PHASE I End date: December 2013 Website: <a href="http://www.ClinicalTrials.gov">www.ClinicalTrials.gov</a></td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>Xarelto®</td>
<td>1. Strengths: 10 mg, 15 mg, 20 mg 2. CrCl &gt; 50; 20 mg daily for NVAF 3. 15 &lt; CrCl &lt; 50; 15 mg daily for NVAF 4. 15-20 mg for DVT/PE and recurrent VTE prophylaxis</td>
<td>Drug Name: Andexanet Alfa Clinical Trial#: NCT02220725</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Start Date: May 2014 PHASE III End date: December 2014 Website: <a href="http://www.ClinicalTrials.gov">www.ClinicalTrials.gov</a></td>
</tr>
</tbody>
</table>

**Abbreviations:** CrCl = creatinine clearance; DVT = deep vein thrombosis; FDA = Federal Drug Administration; INR = international normalized ratio; NVAF = nonvalvular atrial fibrillation; PE = pulmonary embolus; VTE = venous thromboembolism.

**Sources:** Information compiled from available data presented on medication websites; Eliquis® (http://www.eliquis.com); Pradaxa® (https://www.pradaxa.com); Savaysa™ (http://www.daiichisankyo.com); Xarelto® (https://www.xarelto-us.com).
Table 4. Novel Oral Anticoagulants (NOACs) and Possible Reversal Agents

<table>
<thead>
<tr>
<th>NOAC Generic Name</th>
<th>NOAC Trade Name</th>
<th>Possible Specific Reversal Agent</th>
<th>Antidote Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixaban</td>
<td>Eliquis®</td>
<td>Cofact® (4-Factor PCC)</td>
<td>Sanquin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Beriplex® P/NÒ (4-Factor PCC)</td>
<td>CSL Behring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Andexanet Alpha</td>
<td>Portola Pharmaceuticals</td>
</tr>
<tr>
<td>Dabigatran</td>
<td>Pradaxa®</td>
<td>Idarucizumab</td>
<td>Boehringer-Ingelheim</td>
</tr>
<tr>
<td>Edoxaban</td>
<td>Savaysa™</td>
<td>Aripazine (PER977) (Ciraparantag)</td>
<td>Pernapsa/Daichi Sankyo</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>Xarelto®</td>
<td>Andexanet Alfa</td>
<td>Portola Pharmaceuticals</td>
</tr>
</tbody>
</table>

1A general observational study being monitored by NIH/FDA is currently underway at multiple sites in Germany. This study is simply observing the effects of various methods to stop uncontrolled bleeding as it occurs among patients using any of the NOACs. Reversal strategies being observed include: blood transfusion, platelet concentrates, Vitamin K, prothrombin complex concentrate (PCC), activated PCC (aPCC), activated factor VII (aVII), fibrinogen concentrate, fresh frozen plasma (FFP), hemodialysis, desmopressin, and tranexamic acid.

Study Title: Reversal Agent Use in Patients Treated With Direct Oral Anticoagulants or Vitamin K Antagonists (RADOA). Clinical trial#: NCT01722786, available at: www.clinicaltrials.gov

2At the writing of this review on January 6, 2015, the FDA has not licensed or approved any of the reversal agents for specific use with any one specific NOAC that are discussed in this paper. In clinical situations requiring rapid responses to life threatening hemorrhagic events, clinicians are likely to use dialysis (dabigatran), FFP or any available PCC (apixaban, rivaroxaban) to stop or slow bleeding (Ferreira & DeLosSantos, 2013; Vilchez, Gallego, & Lip, 2014).

Abbreviations: CrCl = creatinine clearance; DVT = deep vein thrombosis; FDA = Federal Drug Administration; INR = international normalized ratio; NVAF = nonvalvular atrial fibrillation; PCC = prothrombin complex concentrate; PE = pulmonary embolus; NIH = National Institutes of Health; VTE = venous thromboembolism.

requiring rapid action to accelerate coagulation. PCC reverses the effect of warfarin and other coumarin anticoagulants and has been used in cases of significant bleeding in patients with a coagulopathy (INR > 8.0, prolonged PT) (Ferreira & DeLosSantos, 2013). Hemodialysis has also been used in severe bleeding events related to dabigatran, because it has the lowest protein binding of all of the NOACs (Kumar, Smith, & Henry, 2015). Dialysis will not be effective for any of the other NOACs due to their significant protein binding characteristics. The pharmacodynamics and pharmacokinetics of all the NOACs will be presented for review as a table in Part III of this series.

Although there are a number of options available for bleeding associated with dabigatran, at this time there is no FDA approved or licensed antidote for dabigatran (Pradaxa).

**Antidotes Under Study for Apixaban (Eliquis®)**

A recent study has demonstrated successful reversal of the anticoagulation effects of apixaban in human subjects by 4-factor PCCs. Both Cofact® (Sanquin, 2014) and Beriplex P/N® (CSL Behring, 2014) reversed the steady-state pharmacodynamics effects of apixaban in several coagulation assessments. Results suggest that 4-factor PCCs may be useful in the management of bleeding attributed to apixaban (Escolar et al., 2013). Cofact (Sanquin, 2014), a PCC, is supplied as a powder and a solvent for a solution for injection (vial of 10 or 20 ml). The active components are the coagulation factors II, VII, IX, and X (Sanquin, 2014). Beriplex P/N (CSL Behring, 2014) is a white or slightly colored powder reconstituted for intravenous administration. Beriplex is made from human plasma and contains the human coagulation factors II, VII, IX, and X.

Andexanet (PRT064445) is a recombinant, modified Factor Xa molecule (Lu et al., 2013; O’Riordan, 2014; Portola Pharmaceuticals, 2014) that is being developed as a direct reversal agent for patients receiving a Factor Xa inhibitor who suffer a major bleeding episode or who require emergency surgery. It appears to soak up the anti-Xa anticoagulant, making a patient’s own Factor Xa available again to participate in the coagulation process. Phase II results to date have demonstrated that andexanet alfa can immediately reverse the anticoagulant activity of Factor Xa inhibitors by the administration of a short intravenous bolus. This reversal can be prolonged when necessary by the addition of an extended infusion of andexanet alfa. Once administration is stopped, andexanet alfa is rapidly cleared and anticoagulant therapy can be re-initiated, which is critical for patients who have pre-existing prothrombotic conditions. There is at least one ongoing healthy volunteer study to evaluate the ability of Andexanet to reverse apixaban (NCT02207725) (NIH, 2014a, 2014b). The FDA has granted a breakthrough therapy designation (fast-track) to Portola Pharmaceuticals (2014) for andexanet alfa (PRT4445). As with all other NOACs, at this time there is no FDA approved or licensed antidote for reversal of bleeding associated with apixaban (Eliquis®).

**Antidotes Under Study for Edoxaban (Savaysa™)**

Aripazine (PER977; ciraparantag) (Perosphere, 2015) is a synthetic small molecule (D-arginine compound) that has broad activity against various old (heparin, low molecular weight heparin) and new oral anticoagulants (dabigatran, rivaroxaban, apixaban, and edoxaban). A human volunteer study of 80 individuals receiving aripazine published in December 2014 (Ansell et al., 2014) showed that clotting assays (whole-blood clotting time) that were prolonged by edoxaban decreased after the test subjects received aripazine. Another healthy volunteer study is presently ongoing (NCT02220725) (NIH, 2014a, 2014b). Whole-blood clotting times that were prolonged with edoxaban markedly shortened (to within 10% above the pre-edoxaban baseline value) within 10 minutes after dosing with PER977. As with all other NOACs, at this time there is no FDA approved or licensed antidote for edoxaban (Savaysa™).

**Antidotes Under Study for Rivaroxaban (Xarelto®)**

Eerenberg and colleagues (2011) presented evidence that PCCs were effective in reversing the effects of rivaroxaban in normal volunteers. Measurements of standard laboratory markers of anticoagulation were used as evidence of reversal of rivaroxaban. Marlu and colleagues (2012) found similar reversal effects of rivaroxaban when using PCC and recombinant Factor VII with normal volunteers.

More recently, andexanet alpha has been shown to be a more specific reversal agent for rivaroxaban in healthy volunteers, as measured by clotting tests (Hughes, 2013). There is at least one ongoing FDA study (NCT02220725) evaluating rivaroxaban as a specific reversal agent (NIH, 2014a, 2014b). This compound has been fast-tracked as a breakthrough medication by the FDA (Physicians Academy for Cardiovascular Education [PACE], 2013).

**Conclusion**

At this time, the new Factor Xa inhibitors are rapidly gaining acceptance as first-line treatments for patients needing continued outpatient anti-coagulation following orthopedic surgeries and non-valvular atrial fibrillation. The FDA continues to approve these new compounds while the approval of antidotes for bleeding events associated with these medications lag far behind these new drugs.

Part III of this series will outline useful assessment checklists for nurses to utilize in order to define VTE and procedures and protocols for use during acute bleeding events for patients on any of the blood thinners discussed in Parts I and II of the series.

**References**


Nutrition plays a critical role in patient care. Enteral nutrition (EN) support is often indicated in patients with a functional gastrointestinal tract who are unable to meet their nutritional needs through oral intake alone. In patients receiving EN, formula is delivered through a flexible catheter feeding tube into the stomach or small intestine (Padula, Kenny, Planchon, & Lamoureux, 2004). EN support products are classified as being either open system (OS) or closed system (CS).

In an OS, formula from ready-to-use cans, bottles, or tetra paks are poured into the enteral feeding container (usually a bag). Nurses generally have to refill the feeding bag with formula every 4-8 hours due to infection control guidelines; however, this may vary from institution to institution (Phillips, Roman, & Glassman, 2013). In a CS, the manufacturer prefills a ready-to-hang sterile container with formula. The container is spiked using a sterile tubing set before being connected to the patient's feeding tube and is then infused into the patient without further manipulation of the system (Vanek, 2000). CS products are often marketed as having a 48-hour hang time, based on manufacturers’ recommendations (Luther, Barco, Chima, & Yowler, 2003). However, many institutions can use them only with a 24-hour hang time due to the need to change EN tubing every 24 hours (Phillips, Roman, & Glassman, 2013).

Provision of adequate nutrition via EN has been shown to decrease a patient’s length of hospital stay by reducing complications and improving his or her response to therapies (Silkroski, Allen, & Storm, 1998). In an institution utilizing an OS of EN delivery, a patient may go without feeding due to delay in refilling the bag. Therefore, hypothetically, a patient receiving EN through a CS instead of an OS may receive a greater percentage of ordered volume of formula. The research behind this idea is limited.

In a study done by Rees, Ryan, Attrill, and Silk (1988), patients (n=25) receiving EN through a CS received a significantly greater amount of tube feeding compared to those receiving EN via an OS. Similarly, in a study done by Silva, Assis, Silveira, Beghetto, and Mello (2012) that compared ICU patients receiving EN using the OS (n=85) to the CS (n=70), the authors found that patients receiving nutrition through a CS received more volume of EN and more protein (as reported in g/kg) (p<0.05). However, higher calories per kilogram of body weight were prescribed to the OS group and higher volume (as reported in mL/kg) and protein (g/kg) were prescribed to the CS group. Therefore, patients on a CS likely received a greater volume of formula than the patients on an OS because they were prescribed a higher volume, not because of the system utilized. Furthermore, another study (n=417) found that patients on an OS were only receiving 70% of their prescribed tube feeding because of frequent discontinuations and delays in refilling feeding bags (Silkroski et al., 1998).

Purpose of This Study

Previous research done by Phillips and colleagues (2013) at an academic medical center showed that switching from an OS to a CS of EN is beneficial from an economic standpoint. To further investigate the switch from an OS to a CS of feeding at the same facility, this project specifically focused on the amount of formula delivered to patients before and after switching from an open to a closed EN feeding system.

Methods

This quality improvement project did not involve any changes in patient therapy. Both retrospective and prospective data was collected on patients receiving continuous EN before and after switching from an OS to a CS at the author’s institution. Retrospective data included patients receiving EN through an OS. Prospective data included patients receiving EN through a CS. The following information was collected on each patient after receiving continuous feedings for 3 consecutive days: the type of formula ordered, ordered volume (mL/24 hour), and actual volume received (mL/24 hour) according to nursing documentation in the electronic medical record. Days that the patient was NPO were excluded from analysis. A total of 325 feeding days were analyzed on 30 adult patients receiving formula via the OS and 237 feeding days on 30 adult patients receiving formula via the CS (see Table 1). Data was organized, tabulated, and statistically analyzed and reported via descriptive results.

Results

Patients receiving formula in an OS received an average of 74% of ordered volume and patients receiving formula in a CS received an average of 84% of ordered volume (p≤0.05) (see Figure 1). The ranges of ordered volume received per patient in both the open system (43-104%) and the closed system (59-104%) are shown in Table 2.

Discussion

Reasons for EN discontinuation are often unavoidable, occurring primarily because of clinical instability and/or performance of diagnostic and therapeutic procedures (Silva et al., 2012). With a CS, it is less likely that a patient will go with-
out feeding due to an empty bag because nurses are not required to refill the feeding container every 4-8 hours. Consequently, it is assumed that using a CS results in greater percentage of ordered formula delivery. 

Other potential benefits of the CS of EN delivery include that it is easier to administer than the OS, and because of this, has been associated with reduction of nursing time and labor costs. In addition, the CS has been associated with decreased risk of nosocomial infections in patients (Herlick, Vogt, Pangman, & Fallis, 2000; Silkoski et al., 1998; Wagner, Elmore, & Knoll, 1994; Vanek, 2000). Therefore, CS may be safer for the patient and economically beneficial for the institution, while simultaneously increasing nutrient delivery.

There are limitations to the project. Data collection for the CS began only seven days after the author’s facility switched to a CS; therefore, results may have been skewed due to staff unfamiliarity with the new system. Furthermore, the likelihood that discontinuations of feeding were mainly due to diagnostic and therapeutic procedures rather than an empty feeding container cannot be overlooked.

Future research evaluating EN formula delivery should look at clinical outcomes of patients after receiving their total estimated nutritional needs or 100% of the ordered volume of formula/day. Examples of clinical outcomes that could be evaluated include, but are not limited to, improved wound healing, successful weaning from the ventilator, discharge from the ICU, recovery or lack of infectious complications, and survival.

**Conclusion**

At the author’s institution, adult patients receiving EN via a CS received, on average, a greater percentage of ordered volume of formula compared to those patients receiving EN via an OS. Because a CS of EN delivery has also shown to be easier to administer, more cost effective, and safer for the patient, it may be advantageous for medical institutions to utilize this method of EN delivery.

**Table 1.** Comparison of Number of Patient and Data Points Collected in Each Enteral System Type

<table>
<thead>
<tr>
<th>Type of Feeding System</th>
<th>Number of Patients</th>
<th>Total Number of Days on EN Evaluated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>30</td>
<td>325</td>
</tr>
<tr>
<td>Closed</td>
<td>30</td>
<td>237</td>
</tr>
</tbody>
</table>

**Table 2.** Average Percent of Formula Received Compared to Ordered Volume Per Patient in Each Enteral Nutrition Delivery System Type

<table>
<thead>
<tr>
<th>Type of EN Delivery System</th>
<th>Average Volume Received Compared to Volume Ordered</th>
<th>Range of Ordered Volume of Formula Received Per Patient (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>74%</td>
<td>43-104%</td>
</tr>
<tr>
<td>Closed</td>
<td>84%</td>
<td>59-101%</td>
</tr>
</tbody>
</table>

**Figure 1.** Comparison of Average Percent Ordered Volume of Formula Received Per Patient in Each Enteral System Type (p<0.05)

**References**


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**Wendy Phillips, MS, RD, CNSC, CLE, FAND,** is Clinical Nutrition Director, University of Virginia Health System, Charlottesville, VA, and Regional Clinical Nutrition Manager for Morrison Healthcare.
Healthy Practice Environments

Lateral Violence and Bullying in Nursing

The Academy of Medical Surgical Nurses (AMSN) recognizes that workplace violence and bullying is a problem in health care. AMSN provides resources to protect nurses on its website (2015).

Lateral violence refers to acts between colleagues. Bullying is often described as acts perpetrated by one in a higher level of authority. This behavior may involve covert or overt acts of verbal and non-verbal aggression (American Nurses Association [ANA], 2015; Dellasega, 2009). The concept of lateral violence and bullying consists of behaviors such as fighting among nurses, passive-aggressive behavior, eye rolling in response to questions, rude and demeaning remarks, and failure to respect confidences and privacy. Fast facts:

- 40% of clinicians (nurses, pharmacists, others) who had concerns about the safety of a medication order assumed that it was correct rather than interacting with an intimidating prescriber.
- When the prescriber was questioned about safety, 49% of respondents felt pressured into dispensing a product or administering a medication despite their concerns (Institute for Safe Medication Practices [ISMP], 2004).
- 48% of nurses, pharmacists, and others reported strong verbal abuse from physicians and other health care providers (ISMP, 2004).
- 85% of nurses in a statewide study in South Carolina reported being victims of lateral violence and bullying with experienced/seasoned nurses (Dulaney & Zager, 2010).

The National Institute for Occupational Safety and Health (NIOSH) and the Centers for Disease Control and Prevention (CDC) offer a free online course awarding 2.6 contact hours to help nurses better understand the scope and nature of violence in the workplace. The course describes essential components of a comprehensive prevention program, how to apply individual strategies, and ways to develop skills for responding to workplace violence (CDC, 2013).

References


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