Interventional Patient Hygiene: Proactive (Hygiene) Strategies to Improve Patients' Outcomes

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Learning Objectives

Upon completion of this learning activity, the participant will be able to:

1. Define interventional patient hygiene and understand its importance.
2. Identify nurse-sensitive outcomes improved by interventional patient hygiene.
3. Discuss real-life examples of performance improvement initiatives related to interventional patient hygiene targeted to reduce the frequency of ventilated-associated pneumonia, pressure ulcers, and other problems related to skin breakdown.
4. Develop a checklist to start similar performance improvement strategies within your institutions.

More than 140 years ago, Florence Nightingale outlined some of the same challenges that modern nurses face today. "[Nursing] has been limited to signify little more than the administration of medicines and the application of poultices (dressings). It ought to signify the proper use of fresh air, light, warmth, cleanliness, quiet, and the proper selection and administration of diet–all of these at the least expense of vital power to the patient."[1] She understood that nursing was more than the administration of medications and delivering treatments. She believed it was the role of nurses to put patients in the best condition for nature to heal them. Isn't it time for our profession to get back to the basics of nursing care?

Hygiene is a fundamental nursing care activity. According to Webster's Dictionary, "hygiene" is the science and practice of the establishment and maintenance of health. Interventional patient hygiene is a nursing action plan directly focused on fortifying patients' host defenses through use of evidence-based care. It is fully realized in activities including oral care, the bathing process, and incontinence management, which when performed proactively with evidence-based protocols help to prevent hospital-acquired (or healthcare-acquired) pneumonia, pressure ulcers, and other problems related to skin breakdown.

Today's healthcare system dictates that intensive care nurses be primarily focused on the technological aspects of patient care relative to basic care activities. Nurses' accountability for these essential basics of care has been designed out of the current care model. Identifying, implementing, and maintaining quality patient hygiene measures have long been at the heart of modern nursing care. We are called to higher levels of safety and quality standards by government and professional organizations (Centers for Disease Control and Prevention, Agency for Healthcare Research and Quality, Institute for Healthcare Improvement, Joint Commission on Accreditation of Healthcare Organizations, Centers for Medicare and Medicaid Services, Institute of Medicine Report), by hospital administration, and most importantly, by patients. Interestingly, these principles are nothing new; they have simply been put on the "back burner" while technology, documentation, and cost-containment measures have gained higher prominence. This article is a call to action for nursing professionals to get back to the basics of nursing care.

Our intent is to build the scientific and business cases for implementation of interventional patient hygiene by sharing 2 real-life examples of institutions that have created evidence-based protocols for oral care, bathing, and incontinence management. These interventions have reduced the risk of ventilator-associated pneumonia, development of pressure ulcers, and perineal dermatitis (skin damage due to incontinence). The article concludes with tips on how to introduce interventional hygiene into your institution. Doing the right thing for the right patient at the right time by using the right people helps reduce costs and provide the best outcomes (Figure).

LINKING ORAL COLONIZATION AND RESPIRATORY INFECTION

Ventilator-associated pneumonia (VAP) is the leading cause of morbidity and mortality in the intensive care unit, according to the US Agency for Healthcare Research and Quality. VAP is estimated to have a mortality rate as high as 30% to 50%. VAP also increases the average length of stay in the hospital by up to 13 days,[2] with an added cost of $30,000 to $40,000 per episode.[3,4]

Interventions aimed at decreasing the frequency of pneumonia, particularly in patients receiving mechanical ventilation, have had limited effect. Extending the life of ventilator circuits and using heat/moisture exchange (HME) filters, using sucralfate or H_2 antagonists, modulating gastric colonization by use of nonabsorbable antibiotics in the gut, elevating the head of the bed, or varying enteral feeding have not been clearly shown in scientific studies to reduce the rate of VAP. Furthermore, some interventions, such as semirecumbent positioning of the patient, are limited by clinical considerations to a subset of the patients receiving mechanical ventilation, whereas other interventions (selective digestive decontamination) must be used with extreme caution because they may lead to creation of antibiotic-resistant strains of bacteria.

The reason for the limited effect of these interventions is that they do not address the basic pathway by which most bacterial pneumonia occurs. Information drawn from extensive research conducted during the past 20 years indicates that bacterial colonization of the oropharyngeal tract has a much greater influence on the outcomes of respiratory infection than had

previously been thought. The supportive evidence includes the following:

• DNA analysis indicates that the oral cavity, and not the stomach or gut, is the prime source of respiratory-related infection.[5]

• The frequency of VAP was reduced significantly when antibiotic pastes or solutions were administered into the patient's mouth, indicating that reducing the number of bacteria in the oropharyngeal cavity is a key strategy in the control of respiratory infection.[6,7]

• Changes in the salivary activity of the mouth due to the introduction of an endotracheal tube reduce the number of normal flora in the mouth and create an enhanced environment for overgrowth with gram-negative bacilli.[8]

• Colonization occurs rapidly after patients are intubated, and such colonization is highly predictive of pneumonia in intensive care patients.[9,10]

• Colonization of the tissues of the mouth is rapidly followed by the buildup of secretions in the throat and above the cuff of the endotracheal tube.[11] Aspiration of these bacteria-laden secretions is a direct cause of VAP.[12]

• Dental plaque, a complex matrix of secreted and foreign material interlaced with adhered microorgamisms, contributes to the occurrence of respiratory infection. Approximately 40% of all patients admitted to intensive care units have significant levels of dental plaque.[13] Dental plaque worsens particularly in patients receiving mechanical ventilation because of the lack of toothbrushing and good oral care.[14]

A Clinical Study

A study[15] conducted at the Brookdale University Medical Center in New York shows reduced rates of VAP among patients in the medical intensive care unit (MICU) after implementation of a comprehensive oral care program. The initial preintervention study period (January 2001-December 2002) included 859 patients intubated in the MICU. Principles of interventional epidemiology such as staff interviews and direct observation of practice of respiratory therapists, nurses, and physicians did not immediately reveal any significant breaks in aseptic technique (eg, handwashing, changing ventilator circuit every 7 days, replacement of closed suction devices, use of HME filters, handling of humidifiers, use of semirecumbent positioning as indicated, and the use of stress ulcer drugs).

However, several practices related to mouth and dental care among patients receiving mechanical ventilation raised concerns: a lack of a daily oral assessment; disconnection of the closed suction tubing when suctioning the oral cavity; environmental contamination as occurred when used Yankauer devices were left uncovered on the patient's linen, equipment, or other surfaces; inadequate oral suctioning of accumulating secretions; inadequate or no dental care; poor oral tissue practices; and absence of a policy indicating intervals for oral-dental care. After consultation with several key personnel, including critical care staff, the following interventions were implemented (January 2003-December 2004):

1. Education. All physicians, nurses, anesthesiologists, and respiratory care therapists were required to attend an educational forum. Topics covered included the morbidity, mortality, and costs associated with the occurrence of VAP; MICU rates versus national benchmarks; procedure and timing of handwashing; intubation procedures; review of protocols for ventilator circuits, closed suction devices, and HME filter changes; medication administration; care of equipment; and a review of weaning protocols and the policy for semirecumbent positioning.

2. Introduction of a Comprehensive Oral and Dental Care System. During the preintervention period, MICU protocols required "standard" oral care, which included suctioning of the oral cavity as needed using suction catheters or Yankauer devices and glycerine swabs for tissue and lip care. Tubing used for suctioning through the endotracheal tube via a closed suction device was disconnected before oropharyngeal suctioning was done. Dental care products were not used for patients receiving mechanical ventilation. The Infection Control Committee and the Products Evaluation Committee approved for use a comprehensive oral and dental care system (Q-Care Suction Oral System, Sage Products, Inc, Cary, Ill). That system incorporated several novel advances directed at reducing secretions that accumulate in the oral cavity after the introduction of an endotracheal tube and plaque that forms on the surface of teeth. The principal system components include a y-connector, which when placed on a suction canister port provides the capability to attach 2 suction tubings, one for oral care and the second for the closed suction device; a universal handle that accommodates a variety of suctioning and cleansing devices; a covered Yankauer catheter to reduce the risk of contaminating the patient's environment; a suction dental brush designed to mechanically reduce the quantity of dental plaque; a suction oral swab for cleansing the oral cavity and the surrounding tissues; and a suction catheter for removal of secretions that form in the oral cavity. The protocol for use of the system components is summarized in Table 1.

Study Results

A total of 1614 patients were included in the study. Results of the 48-month study indicate a statistically significant decrease of 42.1% in the rate of VAP after the intervention was implemented (Table 2).

Cost Savings

It is estimated that 21 cases of VAP were avoided during the intervention period. Reported figures on attributable cost per infection are estimated at $40,000.[3] The avoided cost of infection for the 21 cases is calculated to be $840,000. The cost of new products for the 755 patients in the intervention period was estimated to be $117,025 annually. Total costs avoided are therefore calculated to be $722,975 (cost of infections avoided minus product cost). The additional savings due to the elimination of various products used during the preintervention period was not calculated.

Summary

Performance improvement in healthcare is currently focused on initiatives related to patients' safety. Given the extent of morbidity and mortality associated with healthcare-acquired infections, their prevention has clearly become a principal goal in the patient safety arena. The study summarized here demonstrates that implementing proper practices to reduce bacterial colonization in the mouth and on the surface of the teeth of intensive care patients decreases the frequency of a major healthcare-acquired infection, ventilator-associated pneumonia. The

results of this study provide evidence of the effectiveness of recent recommendations of the Centers for Disease Control and Prevention that suggest we "develop and implement a comprehensive oral-hygiene program for patients in acute-care settings who are at high risk for healthcare-associated pneumonia."[16]

EFFECTIVE USE OF A HYGIENE BUNDLE TO REDUCE SKIN INJURIES

Pressures ulcers/skin injuries are the fourth leading preventable medical error in the United States.[17] In addition to pain and suffering, one pressure ulcer adds a minimum of 4 days to the length of stay and up to $2000 per stay independent of other risk factors. Pressure ulcers increase a patient's risk of developing a hospital-acquired infection by 25%.[18] Based on results of a national survey conducted from 1999 through 2004, the percentage of hospital-acquired pressure ulcers has remained constant between 6.8% and 8.6%.[19] If we keep doing things the same way, we are likely to have the same results. Hygiene-related activities of early detection and communication of skin issues during the bathing process helped one organization reduce the number of hospital-acquired pressure ulcers. By identifying skin problems during the bath, they were able to apply prevention strategies more quickly and prevent a skin problem from progressing.[20-22] In addition, 2 studies[23,24] in long-term care facilities demonstrated clearly that when an incontinence barrier was applied consistently, resulting in no unprotected episodes, the incidence of pressure ulcers was reduced significantly.

The Clinical Process Improvement Story

Our institution has been involved in a number of process improvement strategies to help improve patients' outcomes. We have initiated daily, multidisciplinary rounds for patients in our intensive care and step-down units and we have implemented patient care bundles. Patient care bundles are best-practice interventions grouped around an aspect of care such as mechanical ventilation or an invasive catheter. After implementation, we saw a decrease in occurrence of VAP and bloodstream infections. Through the rounding process, we noted that urinary tract infections (UTIs) and skin breakdown remained a challenge. When assessing other patient safety and quality issues, we had success in using a "drill-down" approach to look at common factors that put our patients at risk. The group believed that we could be successful by using the same approach to focus our energies on preventing UTIs and skin injury, 2 very basic nursing care activities.

During the drill-down process, we assessed our current skin care regimen, including bathing, pericare and incontinence management, the products we used, and pressure ulcer prevention strategies related to mobility, turning, and bed surfaces. Additional risk factors of nutrition, comorbidities, and level of nurse education were identified. The risk assessment revealed opportunities for improvement in the way we bathe patients, the way we manage mobility/turning patients, and the types of products used. The realization that these opportunities existed brought home the reality that basic nursing care, "Nursing 101," was missing. It appeared that our patient care team was focused on the intricate and complex intensive care activities, including infusions of vasoactive agents, ventilator management, hemodynamic monitoring, and use of sophisticated equipment. The basics were lower on the priority list or forgotten. To address this issue, we decided to focus on assessing skin health during rounds. Each day during rounds, 2 questions were asked; "Does the patient have skin breakdown or redness?" and "Is this patient getting out of bed each day?" By simply focusing on the issue, we raised awareness and some improvement was seen. However, it was clear that an organized quality initiative was necessary to make real and lasting change in care practices for all our patients.

Project Mobilization

With this goal in mind, we initiated several process-improvement strategies. The first initiative focused on mobility through the implementation of a turn team. The turn team consists of 2 staff members (nurses, technicians, or patient care assistants) who are assigned to turn the patient every 2 hours. The assignment is made by the charge nurse at the beginning of the shift, and the names of the 2 people on the turn team are written on the assignment board. They go from room to room repositioning every 2 hours or getting patients out of bed once a day without fail unless a contraindication exists. On average, it takes about 30 to 40 minutes to turn or reposition 28 patients, and staff members rotate, therefore only having to participate once during their shift. This strategy is a basic yet vital way to ensure mobility of patients who are unable to perform the activity themselves. Best-practice interventions were researched, and a bundle for activity and mobility was designed to meet basic care standards to promote patients' being turned every 2 hours and getting out of bed daily (Table 3). The last component of our mobility bundle focused on our bed surfaces. We discovered our current mattresses could support only 250 pounds (112 kg), but the bed frame was capable of accommodating weights up to 400 pounds (180 kg). This discovery led to the use of rental bariatric beds and mattresses in the intensive care unit and step-down unit to meet the needs of our bariatric patients, who make up about 30% of our patient population.

Making the Change Happen

The new bundle was presented to our intensive care unit committee and approved by our medical executive committee. The staff was indoctrinated/educated about the Save Our Skin (SOS) program that was being used in areas of our health system. With this education, staff awareness increased, and we started to note improvement in our patients' skin. We also noticed a decrease in length of stay related to patients' increased activity and improved skin condition that, in turn, decreased our cost per patient day.

Project 2: Patient Hygiene

The second area for improvement was related to our bathing process or patients' hygiene. We noted variation in the processes and the products that our staff used. Some staff used a basin and washcloths for bathing; others used disposable bath cloths. In addition, variations in the performance of routine daily bathing were seen because of time constraints, patients' refusal, or environmental barriers such as staff call-ins, insufficient ancillary support, and supply issues. Several strategies were used to ensure that effective patient hygiene was provided. Staff's schedule was adjusted to meet the workload better. The group decided that picking a stan-

dard time of 10 PM to complete hygiene activities would allow the flex up of ancillary staff to help accomplish the hygiene care activities.

In addition to timing, several other areas of the process needed to be standardized. Best research practices were evaluated to determine how best to meet our patients needs. One problem we experienced was cross-contamination. When a patient became infected with *Clostridium difficile,* there was a greater chance for other patients nearby to become infected. We examined our daily hygiene routine and the process for cleaning rooms. We found 2 potential areas for process improvement: the way we bathe and how we provide incontinence care.

We compared 2 methods of bathing patients: use of a basin and use of a disposable bath cloth system. We worried about the potential to cross-contaminate patients by using regular bath cloths, which could pick up harmful bacteria during bathing that could be transferred to the washbasin and then could be returned to the patient via the bathing process and/or could remain on an environmental surface. After consultation with our infection control nurse and looking at the evidence, we decided to obtain a disposable system for use on patients at greatest risk and/or patients who were already infected.[25,26]

Another source of possible cross-contamination occurred with incontinent patients. Staff were using a multi-use tube of a zinc product to protect patients' skin. Nurses wore the same gloves they used to clean the patient when they applied the zinc product to patients' buttocks and perineal area. The zinc product was left at the bedside and reused as needed. After consultation with our infection control nurse, we decided to change to a disposable single-use product. This change would prevent cross-contamination and avoid the risk of leaving a contaminated tube lying at the patient's bedside. An added benefit of the disposable product was the all-in-one feature. The cleaning and the application of the barrier occurred at the same time, which prevented any unprotected incontinence episodes. Tables 4 and 5 are example procedures for bathing using a basinless product and an incontinence management plan.

During rounds, we addressed nutrition, skin breakdown, and potential breakdown including redness, as well as specialty beds/surfaces. Redness was our warning to get busy and prevent any skin breakdown among our patients. Nutrition was given increased emphasis: daily goal intake amounts were set, and progress was reviewed daily in rounds to ensure that our patients were getting the intake of energy and nutrients required for healthy skin, adequate wound healing, and improved outcomes.

The Hygiene Outcome

We included these interventions as well as others in a UTI bundle. The other care activities included in the UTI bundle were use of a silver-coated urinary catheter and keeping the drainage bag below the patient's bladder at all times (Table 6). One of the key components of the bundle was discontinuing catheter use as soon as possible by daily assessment of need during rounds. Immediate improvement was noted; during the next 4 months, there were no UTIs in our unit, and our UTI rate is only 1% for the year. We are not sure if any specific intervention was the cause of this dramatic and sustained decrease in our UTI rate, but the initiation of our "UTI bundle," which includes best-practice interventions that address use and maintenance of urinary catheters, as well as hygiene and incontinence care, has definitely decreased our UTI rates. Our skin breakdown rate is below the national average, and skin breakdown is now a rare nosocomial occurrence. For patients who come to our unit with skin breakdown, we initiate the "bundles" and monitor during daily rounds, giving staff the recipe to start the healing process. The care bundle grouped essential basic interventions that provide the staff with a roadmap to improved nursing practice and improved patients' outcomes when applied consistently in all patients all the time. Applying best practice/evidence to the way nurses do their work reduces the chance of patients' being harmed by infections and skin injury.

TIPS TO GET STARTED

How do you initiate interventional hygiene within your own unit? When moving evidence into practice, a number of barriers are likely to arise. Barriers include research data inaccessible to busy practitioners, lack of skill in appraising research, and limited organizational and individual support to help implement the evidence.[28,29] It is clear that passive dissemination of information does not work. The greatest success is seen when multifaceted interventions are aimed at different barriers rather than any lone strategy. Build structures and processes that are woven into the fabric of the current routines. Consider including audit feedback to keep staff engaged in the change process.[30] The following steps will help outline a format to begin the introduction of interventional hygiene within your unit/organization:

1. Perform an initial assessment of the current state of oral care, skin integrity, incontinence, and mobility practices within your environment that affect patients' safety.
2. Consolidate current patient safety practices into a comprehensive interventional patient hygiene bundle and build value through sharing of the scientific literature by establishing protocols with the staff.
3. Select processes and products that support compliance with the protocol and allow the nurse to do the right thing in an efficient manner.
4. Implement the change and then measure the results by using benchmarking. Celebrate success; look for progress, not perfection.
5. Check on a quarterly basis for continued compliance until the new practice becomes the routine.

Essential to the success of the 5-step process is to include all persons with a stake in the process from the beginning of the change. Ownership and participation are essential for the change to become real and long lasting. Weave the change into the fabric of the unit or organizational culture.

No longer can we continue to live in a healthcare culture that promotes what Florence Nightingale recognized as a challenge 140 years ago. As she stated in *Notes on Nursing,*[1(p9)] "so deep rooted and universal is the conviction that to give medicine is to be doing something, or *rather everything;* and to give air, warmth, cleanliness, etc., is to do nothing." It is time to reclaim and demonstrate the importance of consistent delivery of the fundamentals of basic nursing care. Interventional hygiene is an effective strategy to ensure that the basics of care are applied to improve patients' outcomes.

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Author Disclosure

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