

Skin and Wound Care Excellence: Integrating Best-Practice Evidence

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Abstract

North York General Hospital (NYGH), in collaboration with Nursing Practice Solutions, Smith & Nephew and the Central Community Care Access Centre, implemented a program in skin and wound care that has made best-practice, evidenced-based wound care management possible, affordable and sustainable. Focused action using advanced wound care products and proven clinical approaches has dramatically improved the identification, protection and support of skin integrity.

Wound prevention and management are among the most direct and cost-effective measures a healthcare organization can take to improve patient safety and quality of life, and they allow for the reduction of expenditures and re-allocation of funds into other important areas. The Skin and Wound Care Program was designed to create and maintain resources within NYGH to ensure the delivery of consistent, best-practice wound prevention and management. The program has successfully sustained a significant reduction in the prevalence of pressure ulcers. Benefits of the program include improved patient safety, health and quality of life.

The Skin and Wound Care Program has seen the transfer of knowledge and evidence-based best practices to both the bedside and the community. Extending the collaborative effort beyond the walls of NYGH has helped the hospital gain further insight into and experience with our community

partners to spread skin and wound best practices across the healthcare continuum. Lessons learned have been shared with other healthcare organizations in forums such as the Congress of the World Union of Wound Healing Societies, thus contributing to the advancement of continuous improvement in healthcare.

Pressure ulcers, defined as ulcerations of the skin and/or deeper tissues due to unrelieved pressure, currently affect one in four patients in Canadian healthcare organizations. Given this high prevalence rate, the prevention and proper treatment of pressure ulcers are of critical importance to the Canadian medical community. In addition, pressure ulcers represent a serious risk to patient safety and a growing litigation risk for healthcare workers. Chronic and debilitating wounds are common across all sectors of Canadian healthcare. For example, the prevalence of pressure ulcers is 26–31% in acute care, 28–31% in long-term care and 15% in the community (Woodbury and Houghton 2004).

As a multi-site teaching hospital, North York General Hospital (NYGH) continually strives to improve safety, quality of care and the overall patient experience through the use of evidence-based best practices. NYGH has collaborated with Nursing Practice Solutions – advanced practice nurses with wound experience and proficiency – Smith & Nephew and the Central Community Care Access Centre (Central CCAC) to

implement a program in skin and wound care that has made best-practice, evidenced-based wound care prevention and management possible, affordable and sustainable.

The majority of pressure ulcers develop in patients in acute care centres; but regardless of whether these ulcers develop in patients in acute care, chronic care or at home, they have an impact. Along with estimated costs of over \$10 billion annually throughout North America (Swanson 1999), pressure ulcers represent a drain on healthcare resources and a major burden in terms of morbidity and reduced quality of life for patients of all ages. Discomfort, low self-esteem and poor body image can cause personal suffering. Osteomyelitis and life-threatening sepsis are associated major complications (Culley 1998). Pain, loss of function and mobility, amputations and death are further consequences of pressure ulcers (Lee 2005).

Currently, healthcare organizations in Ontario and other regions of Canada are under unremitting pressure to match available financial resources with the growing demands of healthcare. Similar to healthcare centres throughout Canada, at NYGH care requirements combined with persistent shortages of qualified clinical staff place an overriding constraint on the usage and allocation of hospital beds.

The increasing complexity and acuity of hospitalized patients, coupled with the aging population and the escalating incidence of chronic diseases, result in a continual escalation in healthcare challenges. Although often hidden and misunderstood, the human and financial costs of wound care, both to patients and healthcare organizations as a whole, are exorbitant. In spite of this, the assessment, protection and support of skin integrity are lost among the many priorities managed by healthcare providers. Skin care becomes a top concern only when the impact of wounds is considered with respect to infections, mortality rates, quality of life, limb amputations, pain and healthcare costs. Hospital-acquired pressure ulceration represents a major failure in systems to secure patient safety and quality of care. A high proportion of pressure ulcers are avoidable with adequate risk assessment and pressure-relieving interventions such as regular turning.

A Southern Ontario Acute Care case study demonstrated that stage III pressure ulcers result in an average length of stay (LOS) of 18.8 days and a total cost of \$19,213. stage IV pressure ulcers necessitate an average LOS of 27.7 days and \$29,208 and stage X ulcers with bone and necrotic tissue involvement result in an average LOS of 73.1 days with a total cost of \$85,436 (Hurd et al. 2008).

The Situation at NYGH

A pressure ulcer prevalence study completed in May 2007 indicated that pressure ulcers were the most prevalent wound at NYGH, at 21%. In comparison, the national pressure ulcer prevalence rate in acute care was 24% (Woodbury 2004). A

2004 survey of available Canadian data found that pressure ulcer prevalence rates averaged 24–26% (Woodbury and Houghton 2005). Of these ulcers at NYGH, 89% were stage I or II. The 2007 audit also found seven pressure ulcers at stage III; the potential cost to manage these seven patients was estimated at \$277,400 and 249 excess bed days.

NYGH set a project benchmark for pressure ulcer prevalence at 10.5%, to achieve a 50% reduction in the first year. The project benchmark was tempered by comparisons with international data from Japan, which has a benchmark of 5.8% (Sanada et al. 2004), the United States, whose benchmark is 8% (Cuddigan et al. 2001), and Australia, which has a benchmark of 16% (European Pressure Ulcer Advisory Panel Prevalence Working Group 2002).

Given the detrimental impact of pressure ulcers, it is important to determine where these wounds originate. The 2007 prevalence study demonstrated that 82% of pressure ulcers seen at NYGH originated in our hospital. This is a key finding since many hospital-acquired pressure ulcers can be prevented through a consistent and rigorous application of best-practice standards. The proven effectiveness of prevention strategies, combined with the large number of preventable wounds at NYGH, suggested that a continued decrease in the overall wound prevalence rate was achievable.

At NYGH, the percentage of pressure ulcers that were infected was 7% and of surgical wound infections was 13%. The cost to treat these infections with antibiotics was averaged \$169 per patient for a 10-day regimen. The case-cost data from Southern Ontario identified the cost of treating resistant infections such as methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE): an MRSA infection has an LOS of 28.8 days with a cost per case of \$43,487, and a VRE infection has an LOS of 44.9 days with a total cost per case of \$85,435.

Another cost related to pressure ulcers involves the daily changing of dressings. At least 48 patients at NYGH had dressings changed daily. This amounted to 56 hours of nursing time per week or 1.4 full-time nurses per week. Reducing this to three times weekly saves 33 hours of nursing time per week, equal to 0.9 full-time nurses. Only 100 patient wounds treated with non-advanced dressings (gauze) can be treated in the same time as 230 patient wounds with advanced dressings.

It was also noted in the audit that there was no standardization in the prevention, assessment and treatment of skin and wounds. Nurses expressed minimal comfort with respect to their knowledge and abilities to direct skin and wound care. A clinical nurse specialist (CNS) was assigned to wound care, and there was a Skin and Wound Care Committee, with a nurse champion from each unit. However, the role of the CNS included the management of wounds and dressings or assisting nurses in dressing changes – little education was provided on

skin and wound care. When surveyed, 100% of clinicians stated that they would benefit from training in wound care.

As a result of this baseline prevalence data, skin and wound care became patient safety and corporate priorities. NYGH, in a collaborative partnership with Nursing Practice Solutions, Smith & Nephew and the Central CCAC, implemented a system of innovation in skin and wound care that has made best-practice, evidenced-based wound care management possible, affordable and sustainable.

Implementation into Practice

The Skin and Wound Care Program was initiated to make the environment of care safer by developing and implementing a comprehensive and competency-based pressure ulcer prevention and management program using evidenced-based best practices. The application of best practices included protocols/procedures, decision supports, education, enhancing organizational culture, building effective teamwork and improving communication.

Securing the commitment and engagement of staff were critical for success. These were accomplished by concentrating on the need to enhance the overall quality and safety of the patient care experience. By applying Lean methodology, a vertical value stream was completed. Dedicated inter-professional clinicians, physicians and those who influence the process collaborated to use their collective knowledge to develop a project plan.

The necessity of patient safety improvements surrounding a common goal provides an opportunity for teamwork and cohesion across systems and organizations. Collaborative teamwork in healthcare delivery ensures that healthcare professionals and providers are used effectively to deliver the best treatment possible. Team members include inter-professional and cross-functional staff so that the solutions developed go beyond the barriers of traditional silos, departmental boundaries and hospital borders.

A pilot study was completed on one medical unit. This included delivering competency-based unit and classroom education. Unit delivery training, a component of the training program, addressed the application of chronic wound theory and documentation to actual patient care. With this background, learners were able to identify and stage pressure ulcers and formulate the appropriate plan of care.

Following this positive experience, it was critical that the organization capitalize on the momentum and broaden the success enterprise wide. Improvement and enhancement have been leveraged throughout the rest of the program through staff awareness and education, product availability, clear accountabilities and expectations for performance. In order to improve the practice of wound care, training and education were provided to the point-of-care clinicians. Nursing Practice Solutions provided a complete package of professional wound care training and resource materials. Competency-based unit

delivery training addressed the application of chronic wound theory and documentation to actual patient care in the patient setting. Education was divided into modules that addressed the prevention, identification, management and documentation (e.g., pathways and assessment tools) for each type of wound (pressure ulcers, diabetic foot ulcers, lower extremity ulcers and surgical wound). The acronym T.I.M.E was integrated as a framework into the education to assist nurses with the assessment and management of wounds. Each module continued to reinforce both the assessment and management based on T—tissue (type of tissue for both assessment and management); I—represented infection (identification and management of infection in a wound); M—identified moisture (the amount of moisture in a wound; the assessment and management of a wound with a great deal or small amount of moisture); and finally E—for edge of wound which integrated the peri-wound area, tunnels and or undermining of a wound as well as the evaluation of the edge of the wound for healing purposes.

The focus of these real-life modules was to assist learners in the transfer of knowledge from books to the bedside. With this background, learners are able to identify patients at risk, formulate prevention strategies, identify and stage pressure ulcers and formulate appropriate plans of care. This competency-based education process was designed not only to assist clinicians in transferring knowledge into practice but also to build organizational capacity. As a result of the Skin and Wound Care Program, clinical staff members are informed and prepared to implement best-practice wound care, including proven techniques and the appropriate use of the best available products and technologies.

Clinical nurse educators participated in a train-the-trainer workshop to develop their own skills and learn to assist in knowledge transfer to the bedside nurses. Clinical nurse educators have a more involved role in wound care consultations and help to resolve clinical issues.

The product formulary was standardized, and now advanced dressings are used to decrease the frequency of dressing changes and the amount of nursing time spent performing dressing changes. More importantly, the use of advanced practice dressings improves wound granulation, expedites healing and significantly reduces the pain associated with frequent dressing changes. Clinical nurse educators support clinicians with complex wound care, and they reinforce best practices to sustain the program.

A wound assessment form was developed and implemented. Standardized patient plans were created from prevention to the management of stage IV pressure ulcers. Organization-wide skin and wound policies were revised. Wound care principles were initiated to establish proper wound care management. Assessment and documentation tools were streamlined with other corporate initiatives such as eCare (online documentation).

Nurses and other clinicians at NYGH use clinical pathways to support consistent, evidence-based, best-practice wound care.

Clinical pathways are based on current regulations and accrediting standards, as well as the most recent research. All care plans and clinical pathways were developed in consultation with the advanced practice nurses and clinical staff and were tested in the field for ease of use.

It is important to note that with electronic patient documentation in place, clinicians have tools readily available to guide the delivery of best-practice wound care. Clinical outcomes for healthcare organizations where best practice guidelines have been established have confirmed that the prevalence of pressure ulcers can be reduced with the implementation of risk assessments linked to consistent prevention clinical pathways.

The Skin and Wound Care Program has verified the transfer of knowledge and evidence-based best practices to both the bedside and the community. A partnership has been formed with the Central CCAC, resulting in consistent product use and best-practice wound care. The strategies used in this project have been spread internally from the units where the project was initially piloted externally to the community. The importance of developing methodologies for continuous improvement from a systems perspective has been reinforced by the successful implementation of the program by our community partners in the Central CCAC. Successes have been shared with other healthcare organizations through various venues such as lectures, conferences (i.e., the Third Congress of the World Union of Wound Healing Societies) and on-site visits. Extending the collaborative effort beyond NYGH has demonstrated the program's broad applicability and transferability across different settings and segments of the healthcare system.

This innovation was designed in such a way that it could be shared, adapted and implemented effectively to improve healthcare and foster system improvements. The Skin and Wound Care Program established the capabilities and resources within NYGH to deliver consistent, best-practice wound care, thereby, improving patient outcomes and reducing costs. The partnership with Nursing Practice Solutions and Smith & Nephew was focused and practical. It put proven tools in the hands of healthcare professionals who work daily with patients who require wound care, and it addressed the specific needs and priorities of NYGH. The program was intended to reduce the incidence and prevalence of pressure ulcers, as well as reduce healing times, with all of the accompanying benefits for patient health and quality of life. The Skin and Wound Care Program includes assessment, prevention, education and best practices for wound care.

Evaluation Methodology

The data-collection survey tool was developed and provided by the advanced practice nurses. This form captures data on specific clinical indicators, such as prevalence of pressure ulcers and other types of wounds (i.e., percentage of pressure ulcers in hospitals, long-term care facilities and community care programs); patient

safety information such as restraint use and falls; prevalence of wound infections; educational needs of the nurses; and patients with wounds who experience pain. To promote consistency in data collection, four advanced practice nurses who have had training and education both on the data-collection form, process and wounds collaborated with NYGH to collect data. Data were collected in May 2007, May 2008, January and November 2009.

Outcomes

Nurses have reported and demonstrated empowerment and autonomy in delivering wound care according to best practices. Positive partnerships have developed with both internal and external stakeholders. Physicians and surgeons have participated in and continue to lead wound steering committee meetings and educational sessions in collaboration with the advanced practice nurses. Unique to this program has been the successful spread into the community – the Central CCAC has identified an 85% decrease in patients discharged with hospital-acquired pressure ulcers. NYGH has provided education sessions for interdisciplinary students both in the classroom and at the bedside for partnering universities.

NYGH has not only met but exceeded its benchmark for the decrease of the prevalence of pressure ulcers (Figure 1). The pressure ulcers that are seen are predominantly stage I and stage II, with a steady reduction in the percentage of ulcers that reach stage III or greater (Figure 2). Advanced dressings are now being used on all chronic wounds, resulting in a drop in daily dressing changes from 40% in 2008 to 0% by the end of 2009 (Figure 3). The utilization of nursing resources, which can be represented in actual nursing hours (extrapolated from database), have been reduced or reallocated to other patient care areas through the direct reduction of the task of daily dressing changes (changing from daily dressings to every 3–7 days) and caring for patients with pressure ulcers. This has been extrapolated from the original database (based on average of 10 minutes per dressing change) and would represent a total of 119.9 hours (45.5 hours for reduction of pressure ulcers and 74.4 hours for reduction in daily dressing changes) or 2.9 FTE.

Continuing audits have revealed an increase in documentation compliance of completion of patient plans/pathways from original of 28% of documented patient plans to 100% documentation of patient plans/pathways. Feedback from staff has resulted in revisions to documentation to ensure compliance and ease of documentation.

Sustainability

Regardless of the project or the priority, sustaining change over time is a long-term endeavour. Adding resources or skills to a poor process may be a quick fix but is not necessarily the best solution to enhance the sustainability of a project. The challenge for healthcare is that quick fixes will continue to surface until the

Figure 1. Prevalence of pressure ulcers

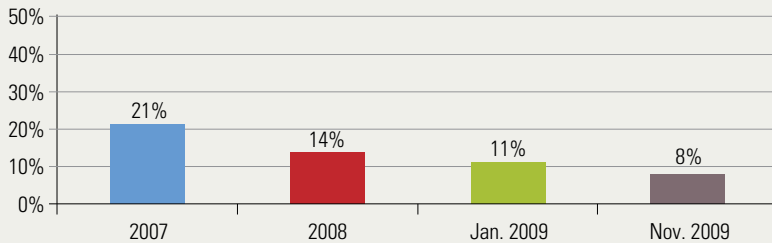


Figure 2. Percentage of hospital-acquired pressure ulcers at stage III or greater

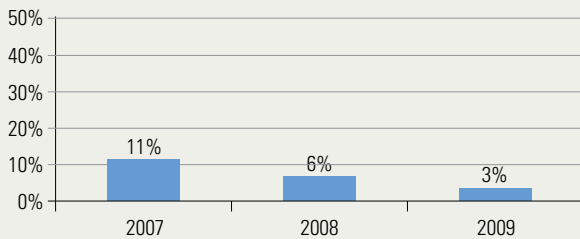
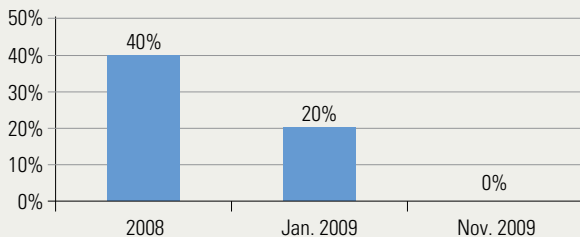


Figure 3. Percentage of daily dressing changes



culture of an organization shifts to that of continuous improvement. In a culture of continuous improvement, point-of-care staff comprehend the importance of their collective wisdom driving the changes. Subsequently, they realize that it is their responsibility to inspire, implement and sustain momentum to close the quality gaps.

The collaborative approach ensures that the views and opinions of those most affected by a process are accepted and legitimized. The collective wisdom of the team gained through their years of experience is applied to diagnose problems and develop solutions. Stakeholders not participating on the team are engaged at all times as their feedback is solicited on any proposed changes. The probability for long-term sustainability of improvements is far greater when the changes are made collaboratively rather than imposed on care providers.

The staff at NYGH continue to receive ongoing wound care education to enhance their knowledge of the prevention and management of wounds. Nursing orientation has been modified to include an overview of the Skin and Wound Care Program to new employees. Staff members are also familiarized through ongoing educational opportunities, including e-based learning from the Global Wound Academy.

The sustainability plan for skin and wound care includes a hospital-wide knowledge transfer strategy, a bi-annual prevalence study, on-unit support by clinical nurse educators, the involvement of advanced practice nurses for five years, an inter-professional approach and inter-organizational collaboration with community partners. **HQ**

References

Cuddigan, J.L., E.A. Ayello and C. Sussman, eds. 2001. "Pressure Ulcers in America: Prevalence, Incidence and Implications for the Future: An Executive Summary of the Pressure Ulcer Advisory Panel Monograph." *Advances in Skin and Wound Care* 14(4 Part 1 of 2): 208-15.

Culley, F. 1998. "Nursing Aspects of Pressure Sore Prevention and Therapy." *British Journal of Nursing* 7: 879-86.

European Pressure Ulcer Advisory Panel Prevalence Working Group. 2002. "Summary Report on the Prevalence of Pressure Ulcers." *EPUAP Review* 4.

Hurd, T., N. Zuliani and J. Posnett. 2008. "Evaluation of the Impact of Restructuring Wound Management Practice in a Community Care Providers in Canada." *International Wound Journal* 5(2): 295-304.

Lee, B. 2005. *The Wound Management Manual*. New York: McGraw-Hill.

Sanada, H., T. Moriguchi, Y. Miyachi, T. Ohura, T. Nakajo, K. Tokunaga et al. 2004. "Reliability and Validity of DESIGN, a Tool that Classifies Pressure Ulcer Severity and Monitors Healing." *Journal of Wound Care* 13: 13-18.

Swanson, L. 1999. "Solving Stubborn-Wound Problem Could Save Millions Team Says." *Canadian Medical Association Journal* 160(4): 556.

Woodbury, G.M. and P.E. Houghton. 2004. "Prevalence of Pressure Ulcers in Canadian Healthcare Settings." *Ostomy Wound Management* 50: 22-38.

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