Pressure ulcer update

Wounds International clinical updates present recent developments in the field of leg ulcers, pressure ulcers, skin integrity and diabetic foot, including the latest from associations, clinicians and industry. If you use an innovative technique in your practice that you would like us to feature in future issues, please email the editor at: *scalne@woundsinternational.com*

Monitoring incidence and outcomes of pressure injuries

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This report summarises some of the information presented during a session at the Australian Wound Management Association conference in Sydney, Australia, in March 2012. It outlines a data collection process conducted as part of an ongoing pressure injury project within Fremantle Hospital and Health Service — a 450-bed, acute care, tertiary health service, located across two campuses in Western Australia.

Fremantle Hospital and Health Service has a long history in pressure ulcer prevention and management. With the introduction of a national incident reporting system in the early 2000s, it was recognised that clinical staff needed to be engaged in the reporting process so that meaningful incidence data could be collected. In a collaborative effort between the Department of Nursing Research and Evaluation and the Clinical Governance Unit, a telephone reporting system was initially introduced in 2003 to expedite the process for clinical staff. Timely follow up of the reported incident allowed for verification of the report and senior staff to be involved earlier in patient management.

Over time, the process evolved into a exceptional collaboration between clinical staff, Nursing Research, Nursing Informatics, Stomal Therapy, Medical Illustrations, clinical nurse managers, Staff Development, Clinical Governance and Clinical Coding. An intranet-based reporting system replaced the telephone reporting system in 2005 to further simplify the routine reporting and follow-up of stage two and above pressure ulcers and more recently it has been upgraded to include skin tears. Clinical staff report incident data at ward or unit level, which are electronically written to a locally developed application called the Pressure Area Reporting and Information System and Skin Tear Audit Research (PARIS*STAR). While this application also captures and assists with the management of skin tears, the focus of this report is on practice initiatives and data that relate to pressure injury prevention and management.

To appreciate the depth of work undertaken by the hospital to understand pressure injury development, it is necessary to mention a few of the in-house resources that are available to staff and/or patients. These include policy and practice guidelines, a knowledge-based questionnaire completed by all nursing staff at orientation, end of bed references, a Microsoft PowerPoint presentation and self-directed learning package, as well as a patient information sheet exist.

Additional measures include a prompt that asks if a short message service (SMS) request for an alternating pressure relieving mattress needs to be sent to the Equipment Pool when nursing staff enter a low Braden Score into an electronic handover sheet[1]. The automation of this process speeds up the time taken to get an alternating pressure-relieving mattress to the high-risk patient. Staff can also send an e-request for a photograph to Medical Illustrations to ensure that an electronic record of the wound is available to clinical staff throughout the admission. This limits the need for dressings to be taken down so that the progress of the wound can be determined.

The detail of all reported pressure injuries entered by clinical staff is automatically captured by the in-house database (PARIS*STAR) created by the Nursing Informatics Department and a first review report is generated. Senior nursing staff in Nursing Research review reports and forward details of the more severe injuries to Stomal Therapy for immediate expert review. Stomal Therapy continue to review stage three and four pressure injuries at least once a week and guide the nursing management of the wound during admission and when preparing the patient for discharge.

The first review form generated using PARIS*STAR and used by Nursing Research and Stomal Therapy includes areas for adding contributing factors, verifying the severity of injury, preventative strategies in place and current management. The additional data are collected when the patient's skin injury is verified by senior clinicians within 24 hours of report and includes the determination of whether appropriate treatment strategies are in place. All data are entered into PARIS*STAR and available for ongoing analysis.

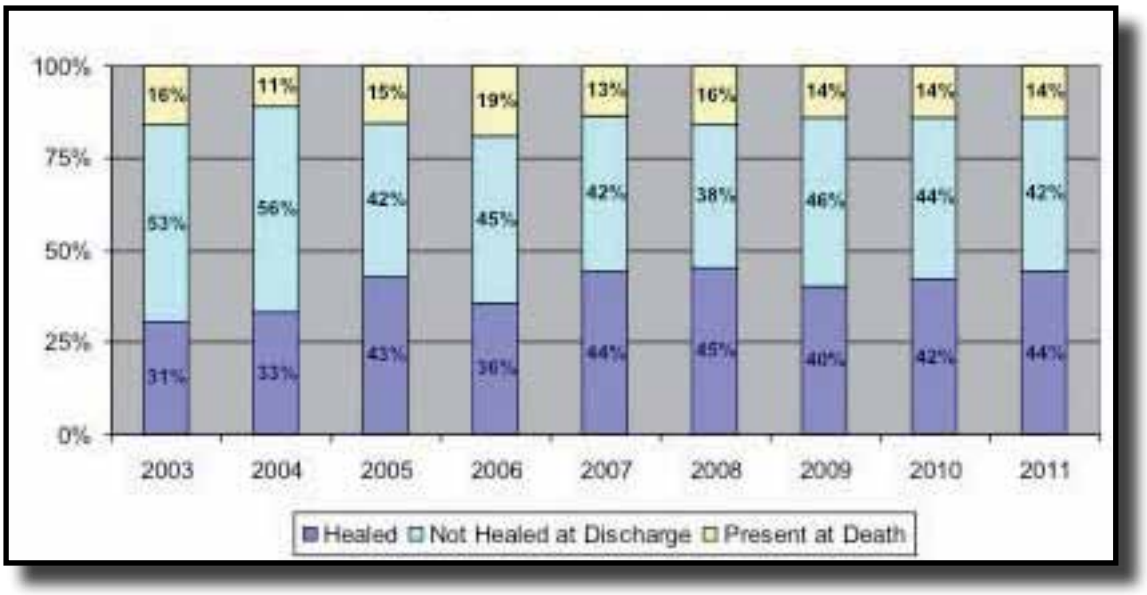

Figure 1. Outcome of pressure injuries acquired during admission, 2003–11.

Once each report is verified, the relevant clinical nurse managers are sent a copy of the completed first review form for pressure ulcers that are acquired during the current admission. Following review and/or comment, these are forwarded to the appropriate directorate nursing director and then the Clinical Governance Unit. The Nursing Research and Evaluation Department generates and distributes weekly review forms to ensure monitoring of progress or deterioration of all verified pressure injuries (i.e.: both those present on admission and those acquired during the current admission) until the injury heals or the patient is discharged.

The outcome for each pressure injury is recorded in one of three main categories — 'healed', 'present on discharge', or 'deceased with'. This level of detail is unique to Western Australia, and, possibly, the whole country. The process provides a data-rich environment that can be explored to help understand the incidence of pressure injuries and the factors that contribute to hospital-acquired injuries.

An area that is currently being explored is the number of patients who either present to hospital with a stage two or higher pressure injury or those that acquire one, and for whom the patient outcome is 'deceased with' [*Fig 1*]. Preliminary review of this data has led to a questioning of the degree to which pressure injuries are preventable and whether the proportion that may indicate skin failure at the end of life is actually larger than first expected[2].

Analysis of each case suggest that there are a number of patients who are not palliative when the pressure injury is reported, but tend to experience a rapid deterioration over a 10-day period, which leads to death that is unrelated to the pressure ulcer.

The following questions are pertinent — how likely is it that skin failure is the first sign of this unexpected outcome? Is it possible to prevent pressure injuries in these patients? Additional contextual information is now being collected at the first review of all hospital-acquired pressure injuries to investigate further exactly which pressure ulcers are potentially preventable.

A preliminary review of this data, collected over a 12-month period, suggests that at least 50% of the hospital-acquired pressure injuries may actually be considered unavoidable, as the care that has been given to the patient prior to the development of the injury reflects current best practice. This result was higher than expected and exceeded the proportion of patients who deceased with pressure injuries. The Nursing Research department, therefore, intends to continue to collect and explore this type of data as it suggests that despite the numerous resources and articles available at the local and international level, our understanding of pressure injury prevention is still incomplete.

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STOP Pressure Ulcer Day, 16 November, 2012

Over the past few years, several wound and pressure ulcer organisations located in Spanish, Portuguese and Italian speaking countries have set aside one day each year to promote pressure ulcer prevention

to professional colleagues, politicians and the general public. This day has become known as the STOP Pressure Ulcer Day and in 2012 will be held on 16 November.

Two of the groups that have participated in STOP Pressure Ulcer days in past years, the Spanish National Group for the Study and Advice on Pressure Ulcers and chronic wounds (GNEAUPP) and the Ibero-Latin-American Society on Wounds (SILAHUE), prompted the drafting of a public statement on the importance of pressure ulcer prevention within the Declaration of Rio. This declaration is reproduced in *Table 1* and can also be downloaded at *http://www.silauhe.org/es/?file=kop1.php* where posters publicising the 2012 STOP Pressure Ulcer Day can also be obtained.

In order to deal with the problem of pressure ulcers, it is necessary to:

- **Achieve a strong commitment to the development and implementation of determined policies aimed to prevent this important public health problem**
- **Ensure that people have an equitable and universal access to high quality technical and human resources to prevent and treat these lesions**
- **Guarantee the use of quality, scientific evidence-based criteria, not just economic ones, when preventive and therapy resources are selected**
- **Improve both basic and post-basic education for clinicians about caring for people with or at risk of suffering these lesions, using an interdisciplinary and integral approach**
- **Promote research, development and innovation for making progress in terms of effectively caring for people with these problems**
- **Promote the creation of wound-care specialised clinical settings, with a clear interdisciplinary approach, and the availability of expert consultants in every community and healthcare setting**
- **Reinforce nursing leadership for caring for people with pressure ulcers, because nurses are the professionals with the most suitable education and the most adequate position in healthcare systems to do this.**

States are responsible to guarantee people right to life and health
Pressure ulcers are a major health problem, which affects millions of people worldwide, deteriorates their health and quality of life, and, eventually, can lead to disability and death
Pressure ulcers produce high costs for healthcare systems and could lead to serious ethical consequences and legal issues for professionals
Scientific knowledge currently available has proved that these lesions could be almost completely avoided (at least 95%)
Pressure ulcers must be considered to be a major threat for patients' safety, both in healthcare systems and in the community.

Table 1. Declararion of Rio de Janeiro on pressure ulcers prevention as a universal human right (October 2011)

The views expressed in the Declaration of Rio succinctly set out the rights of people not to have to experience pressure ulcers along with the steps that each healthcare system should implement to help protect patients. As such, the Declaration of Rio deserves wide dissemination and to be incorporated within the goals and aspirations of organisations focused upon pressure ulcer prevention and treatment.

The European Pressure Ulcer Advisory Panel (EPUAP) agreed early in 2012 that participation in the STOP Pressure Ulcer Days should become a key part of the actions of the organisation. Over the spring and early summer of 2012, the EPUAP trustees have been working to create publicity materials and to generate interest for local events across Europe on 16 November, 2012. The EPUAP will have new materials available at its annual conference in Cardiff (19-21 September, 2012) that will cover:

- **Information on pressure ulcers for patients, carers and families**
- **A fact sheet on pressure ulcers for healthcare managers, policymakers and politicians**
- **An online video alerting people to pressure ulcers and their prevention**
- **Campaign badges will also be available to help promote pressure ulcer prevention and help align each local initiative to the overall campaign.**

The EPUAP is under no illusion that its first participation in the STOP Pressure Ulcer Day will generate local efforts on pressure ulcers in each country and region across Europe. It will take some years for the impact of the Day to build and spread across Europe and wider across the world.

However, the EPUAP is willing to make the commitment to support the STOP Pressure Ulcer Day each year and we hope that many clinicians will take the opportunity to talk about pressure ulcers with their colleagues, their managers and local politicians and members of the public on 16 November, 2012. All efforts focused upon the STOP Pressure Ulcer Day will be reported on the EPUAP website (*www.epuap.org*) and news can be shared by sending details of local events to *epuap@aol.com*.

Let us take the opportunity on 16 November, 2012 to focus upon pressure ulcer prevention and treatment and to begin bringing the problem of pressure ulcers from being a relatively unknown health problem to one that rightly deserves the attention of colleagues, the public and politicians, given the large number of people affected each year and the huge costs incurred by all European healthcare systems.

Michael Clark is EPUAP President; Christina Lindholm is EPUAP STOP Pressure Ulcer Day co-ordinator.

Development of wound care software for smartphones and tablets

The biggest challenges affecting the control and treatment of pressure ulcers are non-compliance to protocol and inconsistency of documentation. Electronic information systems may contribute to better documentation access, accuracy and wound assessments.

The software application, detailed below is prototyped on an Android smartphone and tablet, and offers advantages over paper-based charting, namely — data sharing and remote consultation between multiple healthcare providers; wound histories in graphic and text format, including wound images; alarms for programmable conditions; ongoing learning via help screens and tutorials.

The work can improve documentation of pressure ulcers, improve patient and caregiver experience, and advance e-health in nursing practice. This report describes an interactive software application that runs on a smartphone or tablet device to allow healthcare workers to electronically document pressure ulcers and other chronic wounds. The work advances healthcare applications for handheld devices within the broader scope of e-health.

The prevalence of pressure ulcers is 25% in patients in acute care, 30% in non-acute care, 22% in mixed health-care settings, and 15% in community care[1]. Pressure ulcers are one of the leading iatrogenic causes of death reported in developed countries, with patients in long-term care and the elderly being particularly vulnerable. Although preventable and treatable if found early, bedsores can become chronic, can lead to secondary infections, and may even become fatal — even under the auspices of medical care. The development of pressure ulcers also directly impacts quality of life, as patients face additional stress due to loss of independence and social isolation[2][3]. The problem extends to other chronic wounds, such as venous and arterial leg ulcers, and diabetic foot ulcers.

Risk assessment and regular standardised documentation are identified as critical steps in the prevention and treatment of pressure ulcers, and one of the biggest challenges to controlling and treating pressure ulcers are non-compliance to protocol and inconsistency of documentation[4][5]. These challenges are exacerbated by lengthy forms and time pressures on healthcare workers. As a result, electronic information systems are being explored as a means to contribute to better documentation access and accuracy, information sharing and, ultimately, better wound assessments and treatment[6].

A broad review demonstrates numerous e-health technologies being developed for the healthcare community, although they are not well-catalogued. Relative to wound care, MediSense[7] offers wound care software on a web-based interface that can be viewed on a computer monitor.

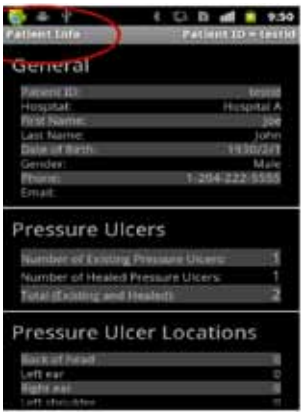

Figure 1. Screen shot of MediSense software.

Well Care Strategies[8] offers healthcare facilities the option to build modular wound care software from a menu of options and features. The product most similar to the authors' work is WoundRounds, developed in the US[9], which is a software application running on a smartphone or handheld device. The authors' work offers the benefit of tailoring the application to the facility-specific wound care forms and other facility-specific preferences and IT infrastructure.

Wound care software on handheld devices

We have developed a prototype e-health solution to promote higher consistency and compliance in wound care documentation in comparison with paper-based systems. It is an interactive software application used to electronically document chronic wounds and wound care, with applicability across hospital, care home, and homecare settings. The wound care software has been developed on the Android platform for 3G/4G smartphones and tablet devices with back-end database services. The software application replicates the data entry on paper forms [*Fig 1*] currently used within the local Regional Health Authority, including the National Pressure Ulcer Advisory Panel's (NPUAP)'s PUSH tool, the Braden Scale, and other wound care management forms used by the specific regional health authority.

Benefits

The software application offers four distinct advantages over paper-based charting.

Telehealth

The wound care software facilitates data sharing and remote consultation between multiple healthcare providers over a 3G/4G cellular or WiFi network. This allows for wound management consultants, physicians, and other specialists to provide team-based care to a patient without physically moving the patient between multiple facilities. The ability to consult remotely is a significant benefit to a patient with pressure ulcers, who will often also experience limited mobility.

Wound histories

The wound care software automatically generates wound histories. In initial focus groups, clinicians indicated that this feature is a significant benefit, since the history of the wound is often difficult to discern from a paper-based patient file. Wound histories are generated in graphical,as well as text-based format, to address individual preferences in overviewing information. Where the smartphone or Tablet includes a high-resolution camera, wound images can accompany the wound histories.

Alerts

The wound care software provides alerts for multiple conditions. These conditions can be programmed by the user, and include rapid wound deterioration (in excess of a programmed threshold for time and/or score), wound that are due for reassessment (relative to a programmed frequency), wounds that have been present for longer than a programmed duration, and other user-generated alert conditions. The alerts are shown to the user immediately upon logging in and accessing a given patient file on the device.

Ongoing learning

The software supports ongoing learning via help screens, on-demand contextual information and built-in tutorials. This extends its applicability as a learning tool in nursing education programmes at colleges and universities. As wound care is a specialty area in nursing, this feature is useful in supporting those clinicians in general practice who provide wound care.

System design

Each smartphone or tablet device running wound care software is associated with an individual healthcare worker and their multiple patients (rather than the device being associated with a unique patient at the bedside and his/her multiple healthcare providers). The general objectives were to design an interface that would maximise user compliance and the value of the data for primary users. This included ensuring the simplicity of the user interface, minimising visual elements on any given screen to reduce clutter, using colour cues to focus information, and converging on critical information. The design minimises the number of steps required to complete common tasks (wound entry, wound assessment), and intuitive guidance leads the user only to the areas of the form applicable for the given patient.

Simple widgets (checkboxes and spinners) are used whenever possible for data entry. Additional functionality considerations include the potential discomfort or inconvenience of carrying the device on one's person, maintaining its battery capacity, considerations in infection control.

Privacy of personal health information and medical records is a significant priority. Each individual is assigned a user ID and password for a secure login. Via a 3G/4G or Wi-Fi connection to a server, access rights are confirmed and the server will hold all patients' wound data and users' information. All user IDs and passwords will only be granted from an administrative standpoint, run by a separate server-side application. For added security, all messages sent from either client or server will be encrypted. If remote server infrastructure is not available or not desirable, the software application can be used with the smartphone or tablet's internal memory card to keep a patient's record private to the device itself. Having one centralised server (whether on site, off site, and/or shared between multiple facilities) allows for privileged, server-side applications to mine the data for anomalies within and between data sets. Overall, being internet protocol (IP) centric, all public internet security protocols would be integrated.

The framework was designed to facilitate extensions to other platforms (iPhone, BlackBerry, tablets, and device-agnostic HTML5 framework) and to other wounds (eg, surgical wounds). Additional extensions can include the reporting of other prevalent community health issues, including monitoring of blood pressure, body weight, blood sugar, depression screening, and dementia screening.

Conclusion

The wound care software detailed here serves as a proof-of-concept of the viability of the technology for one particular patient care application and lays a framework for a range of potential follow-on applications. Documentation compliance is expected to improve through this work with follow-on benefits for patient and caregiver experiences, and ultimately, in patient outcomes. The work also advances e-health in nursing care.

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