New advances in pressure ulcer prevention and management: an Australian perspective

This short report describes how innovative research helped to standardise data collection for pressure ulcer prevalence in Australia. Adoption of this approach and the implementation of national guidelines in 2001 led to reduced pressure ulcer rates and to several state-wide prevalence surveys. New data collection tools, including the use of mobile phone technology for immediate centralised analysis, and the implementation of new interactive initiatives such as the WoundsWest Education Program will be discussed.

Key innovations in Australia

- Standardising a methodological approach to benchmarking
- Using mobile phone technology to collect pressure ulcer data
- Introducing an online wound management education programme.

INTRODUCTION

"There is an immense amount of zinc rubbing but I have not met with a single observation as to whether there was a danger of bed sores"

(Florence Nightingale, 1881) [1]

Miss Nightingale's observation on reading the nurse probationers' diaries was indeed prudent and ahead of contemporary thinking. It was not until 80 years later that health professionals, and nurses in particular, were using risk assessment tools for predicting pressure ulcers [2]. It proved to be as equally long before a scientific approach was adopted to ascertain the physiology of pressure ulcer formation and determine the best evidence for their prevention and management.

This report focuses on the developments in Australia that have contributed to implementation of national guidelines, an interactive online educational programme and the use of mobile phone technology to facilitate accurate data collection and immediate remote analysis of data.

HISTORY OF PREVALENCE STUDIES IN AUSTRALIA

The first published study on pressure ulcer prevalence in Australia appeared in 1983, when the comparative prevalence rates of two hospitals were reported [3]. An increasing number of surveys were conducted during the 1990s, but there were discrepancies in the methods employed to collect data [4].
These discrepancies were mainly found in the testing methods, including the tools used, the pressure ulcer education provided, the inter-rater reliability testing, the populations surveyed, skin inspections versus documentation audits, the staging systems employed, and the endpoints [4].

International benchmarking data on pressure ulcer prevalence and incidence has the potential to contribute to positive outcomes in the prevention of these debilitating wounds. However, while an increasing number of international health services are gathering such data, the opportunity for effective benchmarking is being lost because of a lack of consensus around the methodology employed.

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Standardising a methodological approach to data collection

In 2000, Prentice's PhD research did much to standardise the approach to pressure ulcer prevalence data collection in Australia [4]. Prentice conducted a prospective quasi-experimental study in 10 tertiary hospitals across the country, which involved pre and post tests of the staff's pressure ulcer knowledge.

Prevalence surveys were also conducted in five of these hospitals and involved inter-rater reliability testing of the surveyors/data collectors and a skin inspection of all consenting patients. Baseline measures were then compared with the results of further prevalence surveys, which were conducted six months later following the implementation of the Australian Wound Management Association's (AWMA) Clinical Practice Guidelines for the Prediction and Prevention of Pressure Ulcers [5]. This study demonstrated that the implementation of an education programme and the AWMA guidelines could reduce pressure ulcer rates, as the prevalence went down to 22% (p<0.002) from 26.5% at baseline [4,6].

Due to the success of this study, Prentice's methodology, data collection tools and protocols were subsequently adopted by the Health Departments of Queensland, Victoria, South Australia and Western Australia and used to conduct extensive surveys. Individual healthcare agencies also adopted this method and one effectively demonstrated its suitability in a community setting [7].

Another group of researchers demonstrated the effectiveness of Prentice's methodology when they conducted a multisite study across 23 nursing homes in four states and a population of 1,956 residents, and demonstrated a reduced prevalence of pressure ulcers in elderly care facilities [8].

The advantages of standardising a methodological approach for prevalence studies conducted in Australia have facilitated agency and national benchmarking as well as across different care settings.

State-wide prevalence surveys

The Victorian Quality Council (VQC) used Prentice's methodology to conduct state-wide public
hospital pressure ulcer prevalence surveys in 2003 (PUPPS 1), 2004 (PUPPS 2) and 2006 (PUPPS 3) [9]. The VQC surveys demonstrated a gradual reduction in pressure ulcer prevalence in public hospitals from 26.5% in 2003, through to 20.8% in 2004 and 17.6% in 2006. This represented a significant overall reduction of 33% in the number of patients who developed pressure ulcers in the state. In addition, the 2006 survey revealed a 25.1% increase in the use of a risk assessment tool (RAT) and a 22.3% increase in the use of pressure redistribution devices since 2003.

Further improvements included the routine documentation of pressure ulcers in patient records (86.7% of stage 3 and 87.5% of stage 4 ulcers); the use of existing protocols and policies (35.4% to 71.3%) and the availability of patient literature and mattress replacement programmes. However, two-thirds of pressure ulcers proved to be hospital-acquired and this figure remained relatively unchanged across all of the surveys [9].

The use of Prentice's methodology and tools resulted in similar successes by WoundsWest in Western Australia (WA). WoundsWest is an initiative of the Ambulatory Care and Chronic Disease Management Reform Program and is run in partnership with the Western Australian Department of Health, Curtin University of Technology and Silver Chain Nursing Association. WoundsWest conducted state-wide prevalence surveys of all wounds that involved conducting skin inspections and documentation audits in all 86 public hospitals across WA in 2007, 2008 and 2009 [10-12].

**Introducing mobile phones for electronic data collection**

Mobile phones were used by WoundsWest to allow surveyors to record data on every wound found during the three consecutive state-wide wound prevalence surveys. This innovative paperless data collection method used smart phone technology and ComCare™ Mobile, which had been developed and provided by Silver Chain and previously used by community nurses to record and upload wound assessments and management plans at the bedside. During the surveys, wound locations were plotted on a human outline ('digiman') on smart phone screens using ComCare™ Mobile technology (Fig 1). The data was then uploaded and accessible immediately for remote analysis.
Wounds were broadly categorised as acute (surgical and trauma), pressure ulcers, skin tears, leg ulcers, burns, malignant lesions and 'other’ – the prevalence of all wounds was 49% in 2007, 48% in 2008 and 43% in 2009 [10-12].

Pressure ulcer prevalence was reported to be 11%, 12% and 9% respectively, which demonstrated a 33% decrease in pressure ulcers between 2008 and 2009. An increase of 44% in the number of pressure ulcer risk assessments performed was found when the data from 2007 data was compared to that from 2009 [12].

A pressure-redistributing device was found to be \textit{in situ} in 21% more patients in 2009 as compared to 2007 [12] and it was determined that 4,236 bed days were saved in 2009 due to the 6% reduction in hospital-acquired pressure ulcers, resulting in a significant saving to WA Health of $3.7 million [12].

**INTRODUCING INITIATIVES THAT MAKE A DIFFERENCE**

As a result of the WoundsWest surveys and the availability of reliable pressure ulcer data, new initiatives were implemented including:

- A mattress replacement and pressure redistribution equipment programme for public hospitals across the state [10]
- The distribution of patient literature on pressure ulcer prevention on admission [11]
- The WoundsWest Online Wound Management Education Program (see below).

**An innovation in pressure ulcer education**

Western Australia’s WoundsWest Online Wound Management Education Program is a core component of the WoundsWest Project. It involves the interdisciplinary development of 16 online wound management education modules, which are designed to assist clinicians and health services to deliver best practice in wound management and reduce preventable wounds and adverse wound management outcomes.