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Innovations in pressure ulcer prevention and management: targeted interventions that reduce prevalence

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This short report presents recent initiatives in the US and Canada and around the world for targeted pressure ulcer prevention and management. Prevention is key and the focus needs to be on early recognition of patients at risk and the implementation of targeted interventions, with an emphasis on the effective management of chronic illness.

Key innovations in the US and Canada

1. Recognition that patients with chronic illness often develop pressure ulcers as a secondary complication and the need for better management of chronic illness.
2. Adoption of the Chronic Care Model in Canada - a national paradigm shift in health care from a system that is reactive to illness, to one that is proactive in supporting wellness or keeping people as healthy as possible.
3. Recognition of the need to target education programmes at community nursing assistants who have the potential to impact on patient lifestyles.
4. Recognition that pressure ulcer prevention programmes must focus on the early detection both of pressure ulcers and of the factors that lead to their development.
5. Recognition that patients experiencing any of the following are at an increased risk: recent weight loss, high immobility, recent bowel or urinary incontinence, taking more than eight medications.
6. Development of a new bedside tool (interRAI PURS) for healthcare facilities using a Minimum Data Set (MDS), which predicts the risk of developing pressure ulcers and is useful in targeting clinical resources for prevention and monitoring activities.
7. Introduction of the Pressure Ulcer Awareness and Prevention (PUAP) Program. This activity consisted of a national sustained campaign to raise awareness of the need to prevent pressure ulcers. Adopting powerful marketing and advertising materials, this major initiative infiltrated practice at multiple levels.

Key innovations in the rest of the world

1. Revision of NPUAP staging system to include suspected deep tissue injury and unstageable ulcers
2. Publication of all-time life-changing innovation to show cost-effectiveness in both pressure ulcer prevention and management.
3. Publication of international consensus document on pressure ulcer prevalence and incidence.
4. Development of joint EPUAP and NPUAP international pressure ulcer guidelines.

REVOLUTIONISING PRESSURE ULCER MANAGEMENT

Prevention is key

The key concept needed to revolutionise pressure ulcer care throughout the world is an old one: the recognition that **prevention is better than cure** and thus the provision of prevention programmes is essential. As far back as 1894 Florence Nightingale wrote about the benefit of supporting prevention-based practice [1].

This often overlooked aspect of health care must be taken seriously as the world enters an era of chronic disease management that will end in a financial crisis if prevention programmes are not implemented.

Susan Blumenthal, former US assistant surgeon general and deputy assistant secretary for women's health, is a co-author of a paper that states:

'Failing to adequately address chronic disease risk factors not only limits progress toward achieving health for all Americans, but also jeopardizes our nation's economic security. The US spent nearly twice as much as any other country - 18% of GDP - on healthcare in 2009. Seventy-five per cent of healthcare costs in America are attributable to chronic conditions, many of which are preventable. Yet only 2-3% of the US government's healthcare budget is invested in prevention, a percentage unchanged since 1934' [2].

This statistic not only applies to the US; the Organisation for Economic Co-operation and Development (OECD)-member countries, including Australia, Canada, Japan and the UK, spend on average only 3% of their healthcare budgets on prevention and public awareness programmes [3].

KEY INNOVATIONS IN THE US AND CANADA

Chronic illness and pressure ulcers

Patients may develop pressure ulcers as a secondary complication of chronic illness [4]. This secondary complication is often a result of factors such as being immobile and inactive. Therefore one of the most important actions in pressure ulcer management is **early detection** and **intervention**, not only of pressure ulcers but of the factors, often related to chronic illness, that lead to their development. It is well known that most, but not all, pressure ulcers are preventable, yet healthcare settings still demonstrate pressure ulcer prevalence and incidence rates that are much higher than they should be [5].

People with a debilitating chronic illness often become residents in supported living facilities such as long-term care centres and nursing homes. The US National Center for Health Statistics at the Centers for Disease Control and Prevention used the 2004 National Nursing Home Survey (NNHS) data to provide information on nursing homes, their services, staff members, and the residents [6]. The survey demonstrated that pressure ulcer prevalence rates varied according to clinical characteristics. The survey found the following:

- Residents who had experienced recent weight loss (20%) were more likely to have pressure ulcers than those who had not had a recent weight loss (10%)
- Residents who had experienced high immobility (16%) had an 11% greater occurrence of pressure ulcers than those without high immobility (5%)
- Residents taking more than eight medications had a greater prevalence of pressure ulcers than residents who were taking fewer medications (13% and 9%, respectively)
- Residents with any recent bowel or bladder incontinence had a higher prevalence (12%) than continent residents (7%) [6].

Armed with this knowledge, early intervention to prevent pressure ulcers is not only possible but the responsibility of every healthcare provider.

The Chronic Care Model

Since pressure ulcers can be a secondary complication of chronic illness, effective management of chronic illness is an important part of reducing pressure ulcers. Overcoming gaps or deficiencies related to chronic illness management requires a paradigm shift in health care, from a system that is reactive to illness, to one that is proactive in supporting wellness or keeping people as healthy as possible. The deficiencies in chronic illness management include:

- Practitioners not following established practice guidelines
- Lack of care coordination
- Lack of active follow-up to ensure the best outcomes
- Patients inadequately trained to manage their illnesses [7].

The Chronic Care Model (CCM) provides a framework for care by summarising the basic elements for improving care in health systems at community, organisation, practice and patient levels. The CCM has been adopted and adapted all over the world. A recent report has reviewed studies published on the CCM over the past ten years [8].

Education targeted at community nursing assistants

In the US, certified nursing assistants (CNAs) often work in isolation in patient's homes, performing basic but necessary tasks. As frontline workers they are often the first to see changes in patients related to chronic illness. In recognition of this, Duke University in North Carolina, US, has developed an innovative approach to chronic disease management and offers CNAs a Home Care Chronic Disease Prevention Program [9].

Duke Community Health's CNA training programme is operated in conjunction with the University of South Carolina School of Medicine. The curriculum consists of nine sessions, each of 90 minutes in length, and is designed to:

- Increase CNAs' knowledge and skills concerning chronic disease, including patient coaching skills, to reduce the patient's burden of chronic disease. Specific areas of concentration include nutrition, physical activity and smoking cessation
- Enable CNAs to serve as integral members of the patient's healthcare team
- Increase the knowledge and skills of CNAs to manage and improve their own health behaviour, reducing the likelihood of developing a chronic illness.

A new all-in one assessment tool
In response to the 1987 US Nursing Home Reform laws, the Resident Assessment Instrument (RAI) was developed to provide a comprehensive assessment tool for nursing home residents. The cornerstone of the RAI is the Minimum Data Set (MDS), a uniform, standardised, computerised tool for assessing multiple domains of a person's physical and psychological health and function.

A Canadian study was designed to develop and validate a bedside MDS-based scale to identify nursing home residents at various levels of risk for developing pressure ulcers. This was used to facilitate the targeting of risk factors for prevention [10]. Nursing home staff were required to complete the MDS as well as a pressure ulcer risk assessment.

Eighty-nine long-term care (LTC) homes with 12,896 residents with baseline/reassessment MDS data (median time 91 days), and three LTC homes with 257 residents were assessed with the MDS and the Braden Scale for Predicting Pressure Ulcer Risk, between 2005 and 2007. An assessment/reassessment sample was constructed, resulting in a sample of 17,956, of which 72.7% (n=13,062) had no recorded pressure ulcer at the first assessment.

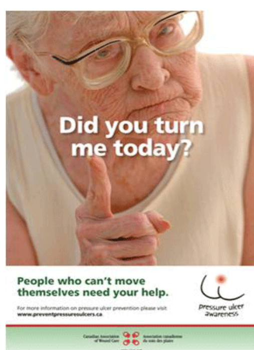
The results of this study indicated the need for a more effective assessment tool and the computerised data obtained was used to develop the new interRAI Pressure Ulcer Risk Scale (PURS). The new tool (interRAI PURS) predicts the risk of developing pressure ulcers and is useful in targeting clinical resources for prevention and monitoring activities. Items used to assess risk using the new interRAI PURS are:

- Impaired in-bed mobility
- Impaired in walking
- Bowel incontinence
- Weight loss
- History of resolved pressure ulcers
- Daily pain
- Shortness of breath.

As an output from an MDS assessment, this new PURS aims to eliminate duplication of effort required by separate pressure ulcer risk scoring and can be done manually at the bedside during the critical early days of a hospital stay when the MDS has not yet been completed. It can be calculated with current MDS instruments (MDS 2.0, RAI-HC v2) as well as with the newer interRAI suite of instruments (interRAI Long Term Care Facilities, interRAI Home Care and interRAI Palliative Care).

A national campaign
The Pressure Ulcer Awareness and Prevention (PUAP) Program was developed in 2006 in response to a Canadian Association of Wound Care (CAWC)-funded study to determine the extent of pressure ulcer prevalence in Canada [5]. The results of the study indicated a pressure ulcer prevalence of 25% in acute care, 30% in non-acute care, 22% in mixed healthcare settings, and 15% in community care. The mean prevalence overall was 26%.

Recognising this as a huge health-related problem, the CAWC funded and created the PUAP Program [11]. This is a continuous quality improvement programme that has been built on a strong foundation of adult learning principles as well as the evidence presented by the Registered Nurses' Association of Ontario (RNAO; www.rnao.org) [12], pressure ulcer assessment by the National Pressure Ulcer Advisory Panel (NPUAP; www.npuap.org) and risk assessment by Braden [13]. The ultimate goal of the PUAP Program is to create a culture shift from **treating pressure ulcers to preventing pressure ulcers**.



Poster used as part of the CAWC's campaign (Reproduced with permission of the Canadian Association of Wound Care)

Five sites from across Canada responded to a request for proposals (RFP) and participated in the pilot programme. The pilot sites were varied, with two acute-care centres and three long-term care centres participating. Selected sites demonstrated a willingness to **initiate and sustain a change of the practice culture** throughout the entire facility in order to reduce the prevalence and incidence of pressure ulcers.

The aim of the CAWC's PUAP Program pilot was to promote positive practice change through a multi-layered programme that:

- Advocated for administrative support for a positive change in culture within the facility. The administrators needed to demonstrate that they were receptive to change by 'signing on the dotted line' in a commitment to support change within their facility.
- Provided educational tools and materials necessary to promote the ideals of best practice. The change process was appropriately facilitated through an approach for education that involved 'layering' educational programmes and materials as well as the addition of new, clinically focused activities such as high-risk rounds.
- Empowered caregivers, patients and their families to understand how their involvement in patient care can help reduce the development of pressure ulcers. A new admission procedure ensured education of the patient and family on admission regarding pressure ulcer risk and prevention.
- Provided impetus for government and health officials to create policies that will support activities and processes that will reduce pressure ulcers nationwide.

OTHER IMPORTANT INNOVATIONS FROM AROUND THE WORLD

Revision of NPUAP pressure ulcer stages

A revision in the NPUAP categories [14] for assessing and staging pressure ulcers was an *'Ah ha!'* moment for many woundcare clinicians. In the past, if the skin over a pressure area was intact it was identified as a Stage 1 pressure ulcer; however, experienced woundcare clinicians were aware that not all Stage 1 pressure ulcers were equal. Many were very purple and boggy, indicative of deeper tissue damage and often opened to reveal a Stage 3 or Stage 4 depth of injury. Introducing this new stage will help clinicians to be alert to the possibility of deep tissue injury (DTI). (For revised staging see www.npuap.org/pr2.htm.)

In recognition of this, in February 2007 the NPUAP staging system identified a new stage called **suspected deep tissue injury,** which differentiated between two types of unbroken yet obviously traumatised tissue. Another stage was added to describe ulcers covered with necrotic tissue that were now to be called **unstageable** since the depth of injury is undetermined.

Most important innovation of all time

A fundamental innovation in pressure ulcer management, in my opinion, is the paper by Bennett *et al* (2004) [15]. This illustrates how to implement cost-effective care using the delivery of best practice based on the European Pressure Ulcer Advisory Panel (EPUAP; www.epuap.org) recommendations and EPUAP grading. This landmark paper is seen as the 'Holy Grail', which can be used to encourage administrative support for change.

In Canada, we were able to use the Bennett *at al* (2004) model to show the following healthcare savings when implementing the PUAP Program. This is based on a 35% decrease in pressure ulcers that occurred during the PUAP Program's six-month pilot:

'If a 100-bed healthcare facility achieves a 35% decrease in pressure ulcers, their cost-saving annually could be anywhere from $240,000 to $1.2 million, depending on the degree of trauma and complications (uncomplicated Stage I: $239,000 to Stage IV: $314,000; complicated with critical colonisation Stage II: $352,000 to Stage III/IV: $390,000; complicated with osteomyelitis Stage II to IV: $1,232,000)' [5].

This provided impressive data in support of gaining vital resources for adopting a **systematic approach** to pressure ulcer prevention and management.

Innovations supported by industry

In 2008, Kinetic Concepts Inc (KCI) provided an educational grant for the report, *International Guidelines - Pressure Ulcer Prevention: Prevalence and incidence in context* [16]. An international group of 16 experts in pressure ulcer prevention and treatment acknowledged that quantifying pressure ulceration is complex and variations in the type of data collected and methods used during collection make valid study comparisons difficult.

Through this international guideline the experts provide consensus opinion on the role of epidemiological studies in the development and evaluation of pressure ulcer prevention programmes. The statements developed in this

document provide guidance on performing prevalence and incidence studies and how to use data collected to improve standards of care.

NEW AND AWAITED INNOVATIONS

The new EPUAP and NPUAP guidelines

The recent publication of the International Pressure Ulcer Guidelines in October 2009 is a major achievement. These guidelines focus on prevention and treatment and have been created jointly by the EPUAP and NPUAP.

Members of both organisations, and other interested parties, were given the opportunity to comment on draft guidelines though the stakeholder process. The final guidelines present an international, multidisciplinary perspective on the current evidence on best practices for pressure ulcer prevention and treatment and are suitable for widespread dissemination to clinicians throughout the world [17].

National campaigns to reduce/prevent chronic illness

Chronic conditions such as non-communicable diseases (including diabetes, cardiovascular disease and chronic obstructive pulmonary disease), long-term mental disorders and certain communicable diseases such as HIV/AIDS are the leading causes of death and disability in the world.

The World Health Organization reports that currently chronic diseases are responsible for 60% of the global disease burden. In Canada, the current cost of illness, disability and death due to chronic disease is over $80 billion annually. In response to this growing burden, many countries around the world are taking a great interest in improving the management of chronic conditions [18].

In 2008, the UK's Department of Health created a £30 million Healthy Community Challenge Fund called Change4Life to support healthy lifestyle choices. Nine towns were chosen to encourage their residents to change their lifestyle to include regular physical activity and healthy food choices, with the aim of preventing overweight and obesity [19]. The towns, which have been through a rigorous selection process, will match the government's funding and have set out pledges on how they will encourage healthy living. We look forward to the results of this novel and innovative approach to creating healthy communities.

CONCLUSION

Pressure ulcer management should continue to focus on prevention, along with early detection and intervention for those at risk. This requires effective communication, education, and cost-effective and evidence-based care. In particular, there needs to be dialogue among bedside clinicians, as well as administrators, policy makers, educational institutions and consumers to discuss the impact that prevention programmes can make.

Savings to the healthcare budget are just the tip of the iceberg; costs related to pressure ulcers occur in loss of work days, patient suffering and the impact on family dynamics. Since pressure ulcers have been shown to be related to chronic health conditions, health promotion strategies should be considered and implemented.

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Page Points

- *Pressure ulcer prevention is an often overlooked aspect of health care*
- *The provision of prevention programmes is essential*
- *There is a strong correlation between chronic illness and pressure ulcer development*
- *Targeted education at those that can make a difference is essential*
- *Adoption of the Chronic Care Model offers a paradigm shift in health care*
- *Risk related to impaired in-bed mobility, impaired walking, bowel incontinence, weight loss, history of unresolved ulcers, daily pain and shortness of breath was identified*
- *It must also avoid duplication of effort and be easy to use at the bedside*
- *The introduction of a national campaign was delivered effectively at many levels with the aim of creating a culture shift from treating pressure ulcers to preventing pressure ulcers*
- *The revised NPUAP staging system includes recognition of deep tissue injury and unstageable ulcers*
- *The international consensus document on pressure ulcer prevalence and incidence provides guidance on performing epidemiological studies and how to use data collected to help improve standards of care*
- *An all-time life-changing innovation is provided by the paper by Bennett et al (2004), which shows how to implement cost-effective care for pressure ulcer prevention and management*
- *The introduction of new international pressure ulcer guidelines on prevention and treatment are a major landmark*
- *National health promotion strategies can be used to encourage healthy communities to reduce the global disease burden*

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Expert commentary

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Comment on Bennett G, Dealey C, Posnett J. The cost of pressure ulcers in the UK. *Age Ageing* 2004; 33(3):230-35.

This was an intense six month project and we worked very well as a team. Gerry and I had a 'meeting of minds' in relation to agreement on percentages and length of hospital stay etc, and John Posnett quizzed us relentlessly and checked our figures using economic models to present data. Ironically we had trouble getting this paper published and initially it was rejected by the *British Medical Journal* (BMJ). The editorial team decided that it would be of 'no interest to their readers'. Even in 2004 it seems incredible that our findings, which highlighted the fact that '4% of the NHS annual expenditure is spent on treating pressure ulcers' is apparently of no interest to the readers of the *BMJ*, one of the world's leading medical journals.

Age and Ageing proved to be a better journal for dissemination, reaching a wider international audience. The fact that our colleagues from the US and Canada have shown so much interest in this work reflects that there is a greater awareness of costs and a focus on cost-driven health care in the US and Canada. The paper has also been used for the NICE guidelines on pressure ulcer management [1].

The extraordinary economic burden of chronic wounds is a 'very big deal', and armed with the evidence that pressure ulcers are so costly, in Europe we need to take prevention more seriously at every level in order to have an impact on prevalence.

NOTE: This article is freely downloadable at www.ageing.oxfordjournals.org/cgi/content/abstract/33/3/230

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John Posnett

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Reflections on Bennett G, Dealey C, Posnett J. The cost of pressure ulcers in the UK. *Age Ageing* 2004;33(3):230-35.

This work on pressure ulcer costs was one of my first forays into wound care. Both the process and the outcome of this work have been hugely influential in all of my subsequent work. Gerry and Carol were the first senior woundcare professionals I had worked with, and their openness to health economics and their patience in dealing with my deep ignorance on the subject of pressure ulcer prevention and management taught me a great deal about the woundcare profession.

The reason we undertook the work was my early realisation that information on the true economic burden of chronic wounds, including pressure ulcers, was almost completely lacking. This is important because without this basic information it is difficult to convince senior health service managers that wound care is sufficiently important to justify their attention.

In the absence of better information we developed a new methodology that combined estimates of pressure ulcer incidence, treatment times for different grades of ulcer and daily treatment costs to produce a national estimate of costs for the UK. At the time our results were surprising to many because most previous work had significantly underestimated the extent of the true burden. Our work also highlighted how important is the role of nurses in preventing and managing pressure ulcers, and how important it is to avoid ulcer complications such as infection or grade progression, which create the bulk of treatment costs.

We hoped that our initial modelling would encourage others to undertake more detailed costing studies.

Unfortunately such studies are still rare. We are delighted, however, if the work has helped to promote pressure ulcer prevention. My recent work continues the theme of raising awareness - through local wound audits in the UK and elsewhere which emphasise the importance of good wound care by illustrating the costs of wound complications in hospitals and other provider organisations [1-4].

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