

## Best Practice Recommendations for

# Pressure Ulcer Management in People With Spinal Cord Injury – Launch

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### Introduction



his session provided participants with a description of the process undertaken to develop a best practice guideline for the prevention, assessment and treatment of pressure ulcers (PU) in people with spinal cord injury. This population has a high prevalence of Stage III and Stage IV PUs – there is a 35% prevalence of PUs, 80% to 90% of people with spinal cord injury will have a PU during their lifetime, and 15% will have recurrent PUs. Acute care patients (i.e. those with immediate spinal cord injury) typically have sacrum and heel ulcers, while those in the community typically have sitting-acquired PUs and ischial tuberosities. PUs are most prevalent 20 years post-spinal cord injury.

While a number of Canadian and international PU guidelines have been written<sup>1-3</sup>, there is a need to develop a guideline specific to the spinal cord injury population, particularly for sitting-acquired PUs.

The overarching objective of this group was to create a resource that could help clinicians working with spinal cord injury patients to appreciate wound care, and to help those working in wound care appreciate the specific challenges of spinal cord injury. Accordingly, the following statement of purpose was formulated:

*To provide a common framework for spinal cord experts and wound care specialists that will enhance pressure ulcer prevention and management strategies for people with spinal cord injuries across the continuum of care.*

### Methodology

The process began with the identification and invitation of a multidisciplinary and geographically diverse panel. The panel included healthcare professionals and lay representatives from various practice settings and locations (Table 1).

Literature searches were conducted in June 2010 and May 2012. English-language articles published from 2000 onward were identified from PubMed, Embase, Scopus, CINAHL and MEDLINE. The search was restricted to human studies (case studies, experimental, retrospective, cohort studies, randomized controlled trials and systematic reviews) in which at least 50% of subjects had spinal cord injury. The literature search identified 520 citations, from which 331 articles were retrieved.

The best practice recommendation panel (12 members) and working groups (9 members) reviewed the literature, proposed new research from a database search and proposed new recommendations. The group met in Toronto in October 2010 for 2 days to achieve consensus.

Draft guidelines were then prepared and the panelists refined the writing, clarified recommenda-

TABLE 1

### Best practice guideline panel

Susan Andrews RN ET  
Peter Athanasopoloulos CPA  
Jennifer Birt OT  
Karen Campbell PhD RN  
Lincoln D'Souza RN  
Martin Ferguson-Pell PhD  
Christine Fraser RD  
Pamela Houghton PhD PT  
David Keast MD  
James Mahoney MD  
MaryAnn Regan RN  
Scott Worley MD BScPT FRCPC

TABLE 2

**RNAO levels of evidence<sup>1,2</sup>**

Level of evidence	Criteria
Ia	Evidence obtained from meta-analysis or systematic review of randomized controlled trials.
Ib	Evidence obtained from at least 1 randomized controlled trial.
IIa	Evidence obtained from at least 1 well-designed controlled study without randomization.
IIb	Evidence obtained from at least 1 other type of well-designed quasi-experimental study without randomization.
III	Evidence obtained from well-designed, non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
IV	Evidence obtained from expert committee reports or opinions and/or clinical experiences or respected authorities.

tions, and assigned a level of evidence to each recommendation using criteria set by the Registered Nurses' Association of Ontario (RNAO) (Table 2). The draft document was over 90,000 words, covered 10 sections (Table 3), and included 8 appendices (tools and resources), 112 recommendations and more than 330 references. In Spring 2012, 129 stakeholders (physicians, nurses, dietitians, occupational therapists and consumers) were invited to review the document; of the 43 who responded, 97% strongly agreed or agreed with the recommendations. In addition, they provided suggestions on how to clarify and condense the document, and increase feasibility of the recommendations.

**Recommendations**

The distribution of recommendations by level of evidence is summarized in Table 4.

TABLE 3

**Best practice guideline chapters**

1. Pressure Ulcer Prevention and Interprofessional Team
2. Human Factors, Education and Self-management
3. Body Weight, Nutrition, Hematological and Biochemical Markers
4. Principles of Pressure Management
5. Beds, Mattresses and Recumbent Positioning
6. Wheelchairs and Seating
7. Mobility, Activity and Conditioning
8. Assessment After a Pressure Ulcer
9. Pressure Ulcer Treatment: Non-surgical, Surgical
10. Tele-Rehabilitation

**Examples of Level Ia and Ib recommendations**

Four recommendations were supported by the highest level of evidence:

Recommendation 2.2: Prevention during pre-hospital and acute care

- As soon after spinal cord injury as emergency medical and spinal stabilization status allows, review individual risk factors and implement appropriate PU prevention strategies that:

- avoid prolonged immobilization whenever possible (Level IIb);
- limit the time a person is on a spinal board (Level Ia); and
- employ interoperative pressure reduction strategies (Level Ib).

Recommendation 3.8: Daily protein intake

- Provide 1.0 to 2.0 g/kg protein daily for people at risk of developing PU. (Level Ia)
- Provide a daily protein intake at the higher end of the range for people with severe PU. (Level Ia)

Recommendation 9.7: Electrical stimulation to speed closure of PU

- Use electrical stimulation combined with standard wound care interventions to promote closure of Stage III or IV PU. (Level Ia)

Recommendation 8.1: Assessing the individual with PU

- Prompt comprehensive evaluation if PU develops. (Level Ib)

**Pressure management recommendations**

The following recommendations dealing with recumbency, sitting and mobility were presented by Laura Titus. She stressed the importance of a full physical assessment in order to formulate a collaborative plan to identify issues and goals for support surfaces, strategies for integrating pressure management in a person's daily life, and following up with plans for reassessment. In addition, she highlighted the fact that evidence suggests that the more active a patient is, the lower the risk of PU.

Recommendation 4.2: 24-hour approach to PU risk management

- Perform a comprehensive assessment of posture and positioning to evaluate PU risk. Consider all surfaces in both recumbent and sitting positions that a person uses to participate in daily activities over the entire 24-hour period. (Level IV)

#### Recommendation 5.8: Repositioning schedule

- If the person's medical condition allows, turn and reposition individuals who require assistance at least every 2 hours initially. Adjust the repositioning schedule based on the individual's skin response, determined by frequent skin checks, until an appropriate repositioning schedule is established. (Level IV)

#### Recommendation 5.10: Bed rest for PU treatment

- Avoid prolonged use of full-time bed rest to treat PU in individuals with spinal cord injury. Use bed rest, if necessary, to offload pressure completely for a specific and limited time, such as after surgical repair of PU. (Level IV)

#### Recommendation 6.2: Principles of sitting posture and positioning for pressure management

- Address pelvic asymmetry, postural instability, kyphosis and spasticity using postural management and support surfaces.
- Evaluate the effects of posture, deformity and movement on interface pressure distribution, and the influence of subdermal tissue loads on sitting support surfaces.
- Consider the effects of clothing, shoes and additional layers on the surface's microclimate, friction, shear and pressure-redistributing properties. (Level IV)

#### Recommendation 6.18: Schedule for periodic reassessment

- Establish a mechanism for regular reassessment of performance of sitting support surfaces specific to PU prevention and treatment. Schedule reassessment at least every 2 years, or sooner if any of the following occurs:
  - health status changes, including weight or medical changes;
  - changes in functional status;
  - equipment wear or disrepair;
  - PU development; and
  - changes in living situation. (Level IV)

#### Recommendation 7.2: PU risks associated with mobility and activity

- Evaluate PU risks associated with movement during the mobility assessment, including the following:
  - Adequacy of postural support in all positions to reduce the risk of shear due to sliding
  - Protection of vulnerable bony prominences from trauma at rest and during movement
  - Amount of lift off different surfaces achieved by the individual during movement to minimize friction

TABLE 4

### Distribution of recommendations by level of evidence

Level of evidence	Number of recommendations supported by this level of evidence
Ia	3
Ib	7
IIa/b	13
III	30
IV	80

- Safety of environmental configuration to minimize the risk of trauma and falls, including maintaining all transfer surface heights as equal as possible
- Level of attention the individual gives to movement quality
- Identification of factors that interfere with movement quality or safety (Level IV)

#### Recommendation 7.7: Wheelchair skills

- Integrate controlled simulations into a formalized wheelchair skills training program. (Level Ib)

#### Recommendation 7.8: Individualizing weight-shift strategies

- Individualize pressure-redistributing strategies using a variety of weight-shifting approaches including automatic pressure redistribution with functional movement, active lifting or shifting, and dynamic weight shifts (tilt and recline) with and without power-assist.
- Base the duration, frequency and amount of active or power-assisted weight-shifting on the individual skin response and the effectiveness of the strategy across the full day. (Level III)

### Pressure treatment recommendations

The treatment of PU in spinal cord-injured persons does not differ significantly from non-spinal cord-injured persons. Many of these best practice recommendations would be known to the audience from other sources. The best practice recommendations panel confirmed these recommendations, with some nuances.

#### Recommendation 9.3: Beds and mattresses

- Consider replacing the recumbent support surface with one that provides better pressure redistribution, offloading capabilities, shear reduction and microclimate control for individuals who:

- Cannot be positioned off the ulcer
- Have PU on at least two turning surfaces
- Fail to heal, or demonstrate ulcer deterioration, despite appropriate comprehensive care
- Have a high risk of developing additional ulcers
- Bottom out on the existing support surface. (Level IV)

#### Recommendation 9.5: Dressings

- Select a dressing(s) that provides the optimal moisture level to the wound base of superficial PU.
- Ensure the dressing meets the needs of the individual and is modified as individual goals and/or wound status change.
- Avoid using daily dressing changes if at all possible by using absorbent dressings that manage exudate and odour and remain in place for as long as possible. (Level Ib)

#### Recommendation 9.8: Other adjunctive therapies for non-surgical treatment of PU

- Consider adding the following adjunctive therapies to a standard wound care program to speed healing of Stage II, III or IV PU.
  - Electromagnetic energy (Level Ib)
  - Ultraviolet C light (Level Ib)
  - Non-contact non-thermal acoustic therapy (Level III)
  - Topical oxygen (Level III)
  - Maggot therapy (Level III)
  - Topical recombinant growth factors (Level III)
  - Recombinant erythropoietin (Level III)
  - Anabolic steroids (Level III)
  - Activated factor XIII (Level III)
  - Tension therapy (Level IV)
  - Hyperbaric oxygen (Level IV)

#### Recommendations related to risk and human factors

##### Recommendation 1.1: Spinal cord injury interprofessional team

- Develop an interprofessional spinal cord injury team that includes, at a minimum:
  - patient

- physiatrist (or physician with spinal cord injury training)
- occupational therapist, physiotherapist
- wound care clinician
- nurse
- psychologist, social worker
- dietitian

- Include additional members as local resources allow. Ensure that all team members have knowledge of spinal cord injury, and PU prevention and care. (Level III)

##### Recommendation 1.2: Rapid admission to specialized care

- Admit people with spinal cord injury as soon as possible to a specialized spinal cord injury unit staffed by an experienced interprofessional team. (Level III)

##### Recommendation 1.4: Risk assessment tools

- Use the Waterlow, Braden or Spinal Cord Injury Pressure Ulcer Scale (SCIPUS) tool to assess PU risk in people with spinal cord injury. (Level IIa)

#### Publication and dissemination

The guideline document is currently available at the Ontario Neurotrauma Foundation website ([www.onf.org](http://www.onf.org)). Implementation has started via the Knowledge Mobilization Network (a project of the Rick Hansen Institute's Best Practice Implementation program, [www.rickhanseninstitute.org](http://www.rickhanseninstitute.org)), with a focus on those recommendations that are supported by the higher levels of evidence. There are also plans to promote research around gaps identified in the guideline and to develop a practice enabler for the CAWC. ☺

#### References

1. Registered Nurses' Association of Ontario. *Risk Assessment & Prevention of Pressure Ulcers*. 2005. Available at: <http://mao.ca/bpg/guidelines/risk-assessment-and-prevention-pressure-ulcers>. Accessed November 15, 2012.
2. Registered Nurses' Association of Ontario. *Assessment & Management of Stage I to IV Pressure Ulcers*. 2007. Available at: <http://mao.ca/bpg/guidelines/assessment-and-management-stage-i-iv-pressure-ulcers>. Accessed November 15, 2012.
3. Consortium for Spinal Cord Medicine. *Pressure Ulcer Prevention and Treatment Following Spinal Cord Injury. A Clinical Practice Guideline for Health-care Professionals*. 2000. Available at [www.pva.org](http://www.pva.org). Accessed November 15, 2012.



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