The Extent of Chronic Wounds in Canada:

What We Know and What We Don't Know

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and
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In response to a lack of national estimates of the prevalence and incidence of different types of common wounds in various health-care settings in regions across Canada, a study funded by a research grant from the CAWC was conducted to determine, from existing current research data, the extent of chronic wounds in different health-care settings in regions across Canada. The proposal for this project is published on the CAWC Web site[1] and a description of the project was published in *Wound Care Canada*[2] (Volume 2, Issue 1) and is also available on the Web site.[3]

Existing data were sought about the prevalence and incidence of pressure ulcers, leg ulcers and diabetic ulcers in each health-care setting (acute care, chronic care/rehabilitation, long-term care, community), and the human and financial impact of these in Canada. Systematic computer and manual searches of library databases were done to locate studies published in peer-reviewed journals. Personal, telephone, and e-mail contacts were made to locate fact sheets created by other agencies (e.g., Canadian Diabetes Association, Heart and Stroke Foundation of Canada) and local/regional statistics about the extent of human and health-care costs associated with wounds in Canada. Liaisons were made with industry in an effort to access existing large databases. Liaisons were made with CAWC members through personal contacts, publications, educational forums, and the association's Web site. The request for information was posted on the CAWC Web site[4] and a survey was sent to individuals with data in an effort to standardize the type of information obtained. E-mail and telephone follow-up contacts were made to clarify the data that were sent.

Prevalence and incidence studies that were conducted between 1990 and 2003 and that were available between January and November 2003 were included. These studies were obtained from peer-reviewed published reports, unpublished studies, and wound-care company databases. All obtained studies were critically appraised using a modified version of recommended criteria for evaluating prevalence and incidence studies.[5] This process has been described previously.[6] The studies used to determine estimates of prevalence and incidence were those appraised to be of higher quality and homogeneous in that the presence of wounds was determined by direct examination.

Prevalence of Pressure Ulcers in Canadian Healthcare Settings has been published in the peer-reviewed journal *Ostomy/Wound Management*.[6] Data were obtained from 18 acute-care facilities involving 4,831 patients; 23 non-acute-care facilities with 3,390 patients; 19 mixed health-care settings with 4,200 patients; and five community care agencies that

For recommendations for the conduct of prevalence and incidence studies in Canada to reduce bias in individual studies and to encourage uniformity visit the *Wound Care Canada* section of the CAWC Web site at www.cawc.net.

Research Glossary

Prevalence: The proportion of a group of people who have a condition. It is useful for planning health resources and for determining adherence with prevention and treatment guidelines and interventions.

$$\text{Prevalence (\%)} = \frac{\text{Number* of people with a particular type of wound}}{\text{Total number of people in the population}} \times 100$$

Incidence: The proportion of a group that develops a wound over a period of time, or the rate at which new cases arise in a group of people as time passes. It is useful for planning health resources and for determining adherence with, and effectiveness of, prevention/treatment guidelines and interventions.

$$\text{Incidence} = \frac{\text{Number* of people with new wounds in a specified period of time}}{\text{Total number of individuals at risk in the population during that period}} \times 100$$

$$\text{Incidence Rate} = \frac{\text{Number* of people with new wounds in a specified period of time}}{\text{Total person-time observed among the people at risk}} \times 100$$

*Numbers represent the number of people, not wounds

surveyed 1,681 patients. The generic term *non-acute* has been used in this project to describe long-term care, nursing homes, complex continuing care, skilled nursing facilities, rehabilitation, and geriatrics since some of these terms have changed over the past few years. Estimates of pressure ulcer prevalence were as follows:

- Acute care 25.1 per cent (95 per cent Confidence Interval* [CI] 23.8–26.3 per cent)
- Non-acute care 29.9 per cent (95 per cent CI 28.3–31.4 per cent)
- Mixed health care 22.1 per cent (95 per cent CI 20.9–23.4 per cent)
- Community care 15.1 per cent (95 per cent CI 13.4–16.8 per cent)

The overall estimate of the prevalence of pressure ulcers in all health-care institutions across Canada was 26.0 per cent (95 per cent CI 25.2–26.8 per cent).

Data concerning the incidence of pressure ulcers in health-care settings in Canada were obtained from three acute-care facilities involving 213 patients; 12 non-acute-care facilities with 1,045 patients; and three mixed health-care settings with 1,074 patients. Estimates of pressure ulcer incidence were as follows:

- Acute care 14.3 per cent (95 per cent CI 9.6–19.0 per cent)
- Non-acute care 10.6 per cent (95 per cent CI 8.8–12.5 per cent)
- Mixed health care 5.2 per cent (95 per cent CI 3.9–6.6 per cent)

No estimate of incidence was obtained from community care. The overall estimate of the incidence of pressure ulcers in all health-care institutions across Canada was 8.4 per cent (95 per cent CI 7.2–9.5 per cent). There were few incidence studies, and most of these estimates were derived in Ontario.

By combining information from studies performed across Canada, we also have a good estimate of the prevalence of all types of ulcers receiving community health service. The overall mean prevalence from these studies performed on patient populations receiving home care suggests that 35.5 per cent (95 per cent CI 33.9–37.1 per cent) of individuals in this health-care setting have skin ulcers due to various etiologies. One study recently published by Harrison et al. surveyed the number of patients with leg ulcers in an urban community and estimated that 0.18 per cent of the population had an open wound on their leg.[7] Clinical examination of this leg ulcer population using objective assessment tools revealed that 41 per cent of them were due to venous insufficiency.[8] An unpublished study that examined patients within home-care services in the Prairies suggested that seven per cent of patients receiving this service had leg ulcers.

While we have confidence in the pressure ulcer estimates of prevalence, our work has identified that there remains much information on the subject that still needs to be gathered. We have identified gaps in our knowledge of the prevalence and incidence of different types of wounds in health-care settings in regions in Canada. The charts on page 20 indicate with check marks (✓) the regions of Canada from which there were estimates of prevalence and incidence of ulcers.

* The 95 per cent Confidence Interval (CI) around the estimate of prevalence or incidence allows us to state that we are 95 per cent confident that the true prevalence or incidence value in the population is within the confidence limits. The formula for the 95 per cent CI has been published previously in Baumgarten M. Designing prevalence and incidence studies. *Adv Wound Care*. 1998;11:287-93.

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Location of Health-care Setting Estimates of Prevalence and Gaps

	BC	Prairies	ON/QC	Atlantic
Pressure Acute	✓		✓	✓
Pressure Non-acute	✓		✓	✓
Pressure Community	✓	✓	✓	✓
Leg		✓	✓	
Diabetic				
All Wounds Community		✓		✓

Location of Health-care Setting Estimates of Incidence and Gaps

	BC	Prairies	ON/QC	Atlantic
Pressure Acute			✓	
Pressure Non-acute	✓		✓	
Pressure Community				
Pressure Mixed	✓		✓	✓
Leg				
Diabetic			✓	
All Wounds Community				

From these charts it is evident that

- Estimates of pressure ulcers are available for all types of health-care settings from across Canada except acute and non-acute-care facilities in the Prairie provinces.
- There is less information about pressure ulcers in the community.
- There is very limited information about the prevalence of ulcers types other than pressure ulcers.
- There is limited prevalence information about leg ulcers in the community, and no study was located that provided an estimate of the prevalence of diabetic foot ulcers in any health-care setting or the whole population.
- Studies that estimate the incidence of new ulcers in various settings are sparse.

In addition to these regional gaps, there are few estimates of the prevalence and incidence of chronic wounds from the general population. Population estimates would be obtained from a health researcher or from a general survey of the population, which could be part of a national survey such as the Population Health Survey. Expense and methodological difficulties frequently prohibit obtaining such estimates. Therefore, we do not know the percentage of Canadians with chronic wounds, but this population value—percentage of Canadians—is the one often quoted by other organizations when lobbying the public or advocating for funds within the health-care system.

Very little information was found about the human and financial costs of chronic wounds. The average total cost per patient to heal pressure ulcers within a complex care facility was estimated to be $11,084 over an average of 192 days.[9] These costs include personnel, dietary, and supplies, as well as infrequent costs, such as beds and seat cushions, but not the hospital program cost. In a recent case study published in *Wound Care Canada* (Volume 2, Issue 1), the cost of care in the community is a similarly alarming figure of $27,600 for three months of care.[10]

Limitations of this project include

1. The term for health-care facilities with non-acute patients has changed over the past five years and is different among regions across Canada. Terms include long-term care, nursing homes, complex continuing care, skilled nursing facilities, rehabilitation, and geriatrics. Because of the varying terminology, we were forced to combine the results into a generic category, which we called "non-acute care." The combination of potentially dissimilar settings in this category may have inflated or deflated the estimates.
2. Most published and unpublished studies contained insufficient information about research methods, and not all necessary results were reported. Sometimes, information could be obtained by additional contacts with study authors. When information was not available, we had to assume that the specific methods were not used or the results were not obtained.
3. We recognize that the data do not represent all of the data collected from Canadian health-care settings. We know of at least three studies that had potentially relevant information, but the researchers could not provide this information because of the relatively short timeline over which we collected the data. Two companies with very large databases of information on this area did not provide us with data because of proprietary and confidentiality issues.

Sufficient data were located from published and

unpublished sources from across Canada to provide a reasonable estimate of the prevalence of pressure ulcers in various health-care settings (acute, non-acute, mixed and community). We are confident that these are valid estimates of the prevalence of pressure ulcers in Canada in these settings since they represent data from a total of 45 studies that surveyed over 14,000 patients in locations across the country. Although the individual study estimates of the prevalence of pressure ulcers vary widely, we have critically appraised the study methodology and found that studies with relatively poor methodological scores tended to underestimate ulcer prevalence. After deleting estimates derived from these flawed studies and combining estimates from similarly conducted high-quality studies, we have prevalence estimates based on sample sizes that are three to 10 times above those necessary to be 95 per cent confident that they represent true estimates of the prevalence of pressure ulcers. Prevalence estimates over the last five years suggest the prevalence of pressure ulcers has decreased but still remains above 20 per cent of patients in acute-care settings.

Areas for future Canadian work in this area include

- obtaining more information about the financial cost of care of chronic wounds
- determining the human costs of chronic wounds, i.e., quality of life
- determining the prevalence of non-pressure ulcers
- determining where wounds first occur through well-designed incidence studies
- advocating for the inclusion of determination of presence of wounds on national population health surveys

A summary of the study[11] and supporting slides are posted on the CAWC Web site.[12]

References

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