Development of the Inlow 60-second Diabetic Foot Screen:

A Practice-ready Bedside Tool to Guide Assessment and Care

BY
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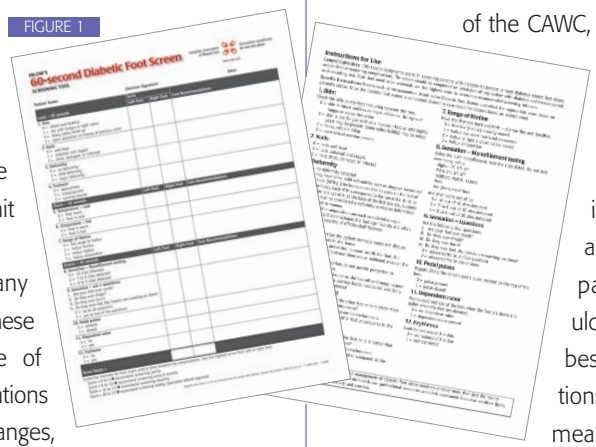
Introduction

This article follows the development of the 60-second Diabetic Foot Screen from its beginnings as a thought in a physician's mind, to an article on diabetic foot assessment for *Wound Care Canada* and to a screening tool that is becoming part of a diabetic foot ulcer prevention education program.

Background

Diabetes takes a daily toll. It is a serious condition and the world's fourth leading cause of death. It currently affects an estimated 246 million people globally, but this number is rapidly increasing. According to the International Diabetes Federation seven million people develop diabetes each year, and the number of people affected is expected to hit 380 million by 2025.[1]

FIGURE 1



Diabetes causes many physiological changes. These can lead to a cascade of events resulting in alterations in the foot. Structural changes, along with arterial insufficiency and sensation deficits, predispose the person with diabetes to develop foot problems that can lead to skin ulceration and, in some cases, amputation and even death.[2]

Best practice dictates that any person with diabetes visiting their health-care professional should have both feet assessed at every visit. But how often is that actually done, and what is actually assessed?[3,4]

Shane Inlow, as founding medical director of the Geriatric and High Risk Foot Clinic in Calgary, decided to address this question by developing a simple yet effective foot-assessment strategy that can easily be used in office practice.

Inlow is known as a clinical expert in the field of diabetic foot ulcers. He was a founding board member of the CAWC, founding scientific advisor of *Wound Care Canada*, and a prominent health-care educator at the regional, national and international levels. He has also authored several papers on diabetic foot ulcers, including the 2000 best practice recommendations. All of this experience meant he was well qualified to take on this project.

In an article titled "The 60-second Foot Exam for People with Diabetes," which was published in *Wound Care Canada* in 2004, Inlow outlined a user-friendly 60-second approach to foot assessment in people with diabetes, covering the key points of a cursory assessment (Table 1).[5]

Inlow's ability to pinpoint the key components of a diabetic foot assessment has made this article popular among wound-care professionals. A 60-second invest-

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ment for a complete foot assessment for persons with diabetes is attractive to those in professional practice.

The Significance of Assessment

The risk factors for foot ulceration in persons with diabetes have been well described in the literature.[6] They include neuropathy, foot deformity, peripheral vascular disease and poor glycemic control. While the identification of risk factors is important, clinicians need to be aware that once any risks for ulceration have been found, it is expected that a plan of care will be put in place to reduce those risks. Although we have best practice recommendations for the prevention and management of diabetic foot ulcers,[6] there is no basic standard assessment/treatment form or tool for clinical use. An algorithm within the best practice recommendations leads the clinician through a pathway for assessment and treatment (Figure 2), but a bedside tool would be advantageous.

Over the years, clinicians and students at the International Interprofessional Wound Care Course (IIWCC) at the University of Toronto have expressed interest in Inlow's approach and indicated that they have integrated his 60-second assessment into their practice. However, although the Inlow article provides simple and straightforward guidance, it does not provide a practice-ready bedside tool to guide assessment and care.

When First Nations and Inuit Health (Ontario Region, Health Canada) approached the CAWC in 2009 to develop a workshop on diabetic foot ulcer prevention, the development of a tool to improve assessment, treatment, evaluation and communication seemed to be the best course of action. The First Nations Diabetes Report Card states that diabetes is a serious and fast-growing concern for our Aboriginal people.[7] Risk factors are often compounded by neuropathy in persons with undiagnosed diabetes, as well as by an often low level of foot care in the community.[8] A new screening tool based on Inlow's article would provide practitioners with a practical means of easily and quickly assessing risk and treating diabetes-related foot complications in any clinical situation.

Developing the 60-second Diabetic Foot Screen

The first step in the development of the tool was a discussion with Inlow regarding whether he felt revisions were required to his original paper. The assessment criteria paralleled parameters identified in the literature[6] and those identified by the International Working Group on the Diabetic Foot.[9] The assessment criteria from the original article were then clearly delineated into parameters to form the framework for the development of the new screening tool.

The second step was the creation of a draft of the tool. This was sent out for review to several health-care professionals who work with persons with diabetes: a nurse, a chiropodist and a family doctor. Minor revisions were made in content and format. Instructions for use were developed—along with recommended frequency of use—and a glossary of terms was added. Efforts were made to align with the screening recommendations from the International Working Group on the Diabetic Foot.[9]

The Inlow 60-second Diabetic Foot Screen (Figure 1) has been designed as a clinic, hospital, home-care or bedside screening tool. The screen should be completed on admission or with the first visit of any client with diabetes. Both feet need to be screened using 12 assessment parameters: skin, nails, deformity, footwear, temperature (hot), temperature (cold), range of motion,

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TABLE 1

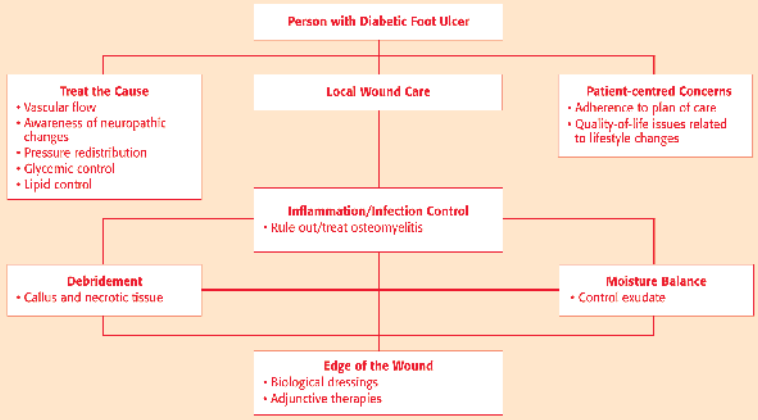
The 60-second foot exam for people with diabetes

	Questions	Physical exam
First 15 seconds	Are your feet ever numb?	Look at the feet/shoes. Visually examine the foot for skin condition, colour, calluses, toenail condition and structure deformities.
Next 15 seconds	Do they ever tingle?	Palpate the foot for temperature and ROM in general (but of the big toe specifically).
Final 30 seconds	Do they ever burn? Do they ever feel like insects are crawling on them?	Check for sensory intactness, especially light touch using a 10-gram monofilament.

Reprinted with permission from Inlow.[5]

FIGURE 2

Pathway to assessment of persons with diabetic foot ulcers



Adapted from Sibbald RG, Orsted HL, Schultz GS, et al[6]

sensation (touch), sensation (questions), pedal pulse, dependent rubor and erythema. Each parameter has multiple assessment statements and associated scores that are matched to the clinical presentation. In the absence of a foot, the amputation site should be assessed. Once parameter assessments have been completed, the tool has a space for the clinician to insert care recommendations. Based on the total score identified through parameter assessment, the clinician is able to determine a recommended follow-up screening routine. The accompanying glossary acts as a cue for each parameter.

Implementation of the 60-second Diabetic Foot Screen

Tools do not stand alone, so the next step was to create a case-based educational event to give clinicians a working knowledge of the new tool. A one-day workshop was developed for First Nations nurses sponsored by First Nations and Inuit Health. The workshop explored the screening tool parameters in depth and reviewed common treatment options.

For example, if footwear was assessed to be inappropriate and presenting a risk for skin breakdown, strategies for helping the person with diabetes to select appropriate footwear were reviewed. Another example related to the identification of heavy callus build-up. The clinicians were taught how to manage the callus and teach the patient to provide ongoing care to prevent further build-up. Undetected or untreated callus formation can lead to ulceration and may even progress to infection and amputation.

In addition, three cases were explored: prevention of a diabetic foot ulcer, management of a simple diabetic foot ulcer and management of a complex diabetic foot ulcer.

Evaluation of the 60-second Diabetic Foot Screen

No tool should be implemented without an evaluation plan. As mentioned earlier, an initial review was completed by expert clinicians. Furthermore, all of the nurses in the workshop went home with an evaluation form to determine the usability and content validity of the new tool. The development team wants to know if the parameters that clinicians are being asked to assess correspond with observed parameters in their patients with diabetic foot ulcers. A second part in the evaluation is based on ease of use: how difficult is the tool to use in actual practice by clinicians involved in client care?

The tool is currently being used and evaluated by several groups across Canada, and all have been asked to complete an evaluation.

Next Steps

We are currently receiving evaluations on the tool and will revise it based on the feedback. The tool will then be assessed for predictive validity and interrater reliability in clinical settings. Once the full evaluation has been completed and any revisions made, the tool and educational program will be made available for widespread distribution.

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*Reference 2005 Philips L, Busby J (2006) Pressure Ulcer Epidemiology in the UK: 2005-2006. Poster presentation at Wound UK, Harrogate.

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