

# Measuring the process and outcomes of foot ulcer care with guideline-based nursing quality indicators

Monique Lloyd, Sarah Xiao, Laura Albornos-Muñoz, Esther González-Maria, Angela Joyce

**The Nursing Quality Indicators for Reporting and Evaluation (NQuIRE) initiative at the Registered Nurses' Association of Ontario (RNAO) is an international database of quality indicators measuring the structure, processes and outcomes of evidence-based nursing practice. The indicators are derived from RNAO best practice guidelines (BPG) to monitor and evaluate the impact of guideline implementation on nursing practice and patient outcomes. Participation in NQuIRE is a program requirement for service and academic organizations in the RNAO Best Practice Spotlight Organization® (BPSO®) Designation. As part of the development of RNAO's second edition of the Assessment and Management of Foot Ulcers for People with Diabetes (2013) clinical practice guideline, six quality indicators related to the assessment of ulcers, patient education, monitoring of ulcer healing and use of offloading devices were developed. These indicators enable BPSOs to demonstrate the contribution of evidence-based nursing practice in delivering quality care and optimizing health outcomes for people with diabetes.**

The Registered Nurses' Association of Ontario (RNAO) is the professional association for registered nurses in Ontario, Canada. The Best Practice Guidelines (BPG) program is an internationally recognized, signature program of RNAO. The RNAO BPG program aims to develop, disseminate and actively support the uptake of clinical and healthy work environment BPGs and to evaluate their impact on patient, organizational and health system outcomes. With funding from the Government of Ontario, the BPG program has been publishing evidence-based nursing guidelines since 1999 to support nurses in improving patient care in all healthcare settings (Grinspun et al, 2001-2). A systematic review of the evidence is conducted for all BPGs and each operational step of the guideline development process is systematically executed with the involvement of clinical experts, academic faculty members and researchers (Grinspun, 2013). To date, RNAO has published 38 clinical best practice guidelines and nine healthy work environment guidelines.

As part of its commitment to actively support BPG implementation, RNAO formally designates many healthcare service and academic organizations in Canada and countries around the world through its Best Practice Spotlight Organization® (BPSO®) Designation. BPSO Designation is internationally recognized as a commitment to the ongoing implementation and evaluation of evidence-based nursing practice on patient, provider and organizational outcomes. Through a competitive application process, service and academic organizations formally partner with RNAO to implement and evaluate BPGs using an evidence-based approach detailed in the RNAO toolkit for implementation of BPGs (RNAO, 2012). First launched in Ontario in 2003, RNAO has since extended the BPSO Designation to include participation from organizations across Canada, the USA, Spain, Australia, Chile and Colombia. To date there are 76 local, national and international organizations, totaling 320 sites, within the BPSO Designation.

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## Article points

1. Guideline-based nursing practice is crucial in delivering quality care and optimizing health outcomes for people with diabetes
2. Process indicators provide key performance data to monitor implementation of best practices
3. NQuIRE will allow health policy decision makers to better articulate the relationship between best practices and quality and clinical outcomes.

## Key words

- Guidelines
- Outcomes
- Indicators

## Authors

Monique Lloyd is Associate Director, Research and Evaluation, International Affairs and Best Practice Guidelines Centre, RNAO. Sarah Xiao is Manager, Research and Evaluation, International Affairs and Best Practice Guidelines Centre, RNAO. Laura Albornos-Muñoz is project manager of the Spanish Collaborating Centre of the Joanna Briggs Institute and scientific coordinator of the BPSO® Designation in Spain. Esther González-Maria is head of the Research and Utilization area of the Nursing and Healthcare Research unit (investén-isciii) and deputy director of the Spanish Collaborating Centre of the Joanna Briggs Institute. Angela Joyce is Project Coordinator, International Affairs and Best Practice Guidelines Centre, RNAO.

***“In collaboration with researchers, NQuIRE data will advance understanding of the interrelationships between nursing-related structural factors and clinical processes that influence patient outcomes.”***

The BPSO Designation has created a platform for an innovative guideline evaluation initiative to measure the impact of evidence-based nursing care. Launched in 2012, RNAO’s Nursing Quality Indicators for Reporting and Evaluation (NQuIRE) is designed for BPSOs to systematically monitor the progress and evaluate the outcomes of implementing RNAO BPGs in their organizations.

### **Nursing Quality Indicators for Reporting and Evaluation (NQuIRE)**

NQuIRE is an international database of guideline-based indicators that measure the impact of evidence-based nursing practice. NQuIRE quality indicators are categorized into three main types following Donabedian’s framework (1988) and include the following:

- Structure
- Process
- Outcome categories.

NQuIRE indicators measure the processes and outcomes of evidence-based nursing care as directed by the practice recommendations within RNAO BPGs. NQuIRE also collects nursing-related structural indicators known to influence nursing practice and patient outcomes, including nursing intensity and skill mix, models of care delivery, absenteeism, turnover and level of nursing education (Doran & Pringle, 2011).

NQuIRE indicators are selected through a comprehensive process that includes a literature review and consensus by expert panel members involved in developing the guidelines, BPSO representatives, and a sample of NQuIRE users. Indicators are also identified using various established databases of quality measures, such as those from Accreditation Canada, the Canadian Institute for Health Information, the Joint Commission and others. Aligning with other quality measures ensures that there is consistency of indicators across different databases, and advances the approach of one-time data collection for multiple uses.

Through NQuIRE, guideline-based indicator data inform how RNAO BPGs are enhancing nursing practice and patient outcomes. This in turn facilitates evidence-based decision making, promotes effective utilization of

nursing resources and highlights practical areas for further investments in nursing best practices. In collaboration with researchers, NQuIRE data will also advance understanding of the interrelationships between nursing-related structural factors and clinical processes that influence patient outcomes.

### **Assessment and management of foot ulcers for people with diabetes Clinical practice guideline and indicators**

The second edition of the *Assessment and Management of Foot Ulcers for People with Diabetes* (RNAO, 2013) clinical practice guideline was developed to provide guidance for nurses and interprofessional practice teams caring for people aged 15 and older with type 1 or type 2 diabetes and a diagnosis of foot ulceration.

From a systematic review of the evidence, structure, process and outcome indicators for monitoring and evaluating this guideline were identified. Together with researchers at the Nursing and Healthcare Research Unit (Investén–isciii), an international host BPSO overseeing the BPSO Designation in seven service organizations and one academic institution in Spain, RNAO conducted an expert review of these indicators for the strength of the supporting evidence, sensitivity to nursing and validity of their definitions. From this review, three process and two outcome indicators were selected and distributed to the guideline development panel and BPSO representatives for clinical expert feedback. Experts were asked to comment on the indicators’ importance to practice, alignment to BPG practice recommendations and data collection feasibility. RNAO and Investén–isciii researchers incorporated the feedback and developed operational and technical indicator definitions (RNAO et al, 2013).

The comprehensive set of indicators identified from the scientific literature corresponding to the level of the organization, provider and patient, is presented in the guideline section titled ‘Evaluation/Monitoring of Guideline’ (RNAO, 2013) according to the framework outlined in the RNAO Toolkit (RNAO, 2012). The six NQuIRE indicators developed for ‘Assessment and Management of Foot Ulcers for People with Diabetes’ (RNAO, 2013) are listed in Table 1.

*“Complete foot ulcer assessment, including a risk classification system, is crucial to determine a client’s level of risk for ulceration, the progress of wound closure and whether further assessments and interventions are necessary.”*

**Table 1. NQuIRE Indicators for Assessment and Management of Foot Ulcers for People with Diabetes (RNAO, 2013)**

Indicator	Type
Percentage of patients with bilateral lower extremity assessment	Process
Percentage of patients with complete foot ulcer assessment	Process
Percentage of patients provided education or educational materials addressing diabetes management and ulcer care	Process
Percentage of foot ulcers with a 50 percent reduction in wound surface area at 4-weeks	Outcome
Percentage of foot ulcers that have closed at 12 weeks	Outcome
Percentage of patients who were prescribed an offloading device	Outcome

Bilateral assessment of lower extremities is recommended to identify calf pain, absence of peripheral pulses and abnormal foot colour, which are significant predictors of vascular insufficiency, future amputation, and ischemia, respectively (Australian Centre for Diabetes Strategies, 2001; Boyko et al, 1997; Falanga et al, 2000; IWGDF, 2011; Krasner et al, 2001).

Complete foot ulcer assessment, including a risk classification system, is crucial to determine a client’s level of risk for ulceration, the progress of wound closure and whether further assessments and interventions are necessary. This information has significant implications for care planning and the identification of appropriate pressure redistribution devices. Furthermore, providing client-centered education regarding diabetes management and foot and ulcer care improves knowledge and self-care behaviours (Dorresteijn et al, 2012; McIntosh et al, 2003). These self-care behaviours have, in turn, been shown to improve blood glucose control, facilitate healing of foot ulcers and prevent or delay diabetes-related complications (IWGDF, 2011; RNAO, 2007; UKPDS Group 33, 1998).

Monitoring the progress of wound healing is essential to determine whether the wound is moving towards desired outcomes and whether best practices are producing positive outcomes. Furthermore, wound measurements should be completed using consistent methods, such as tracings (Krasner et al, 2001). Progress of wound healing at four weeks may be correlated with closure at 12 weeks. Specifically, a 50%

reduction in wound surface area at four weeks has been found to be a strong predictor of wound healing at 12 weeks (Sheehan et al, 2003). Plantar pressure redistribution is also important in preventing and healing foot ulcers. This can be accomplished by redistributing pressure over a larger surface area by applying external pressure offloading or redistribution devices such as:

- Casting modalities, eg, total contact cast
- In-shoe orthoses
- Mobility equipment, eg, crutches, walkers and wheelchairs.

The process indicators provide key performance data to monitor implementation of best practices for performing appropriate clinical assessments and providing client-centered education regarding diabetes and foot care. The outcome indicators further enable evaluation of the progress of ulcer wound healing and use of offloading devices as a result of these evidence-based practices. Coupled with their technical specifications, which provide standardized definitions, tools and procedures to ensure consistent measurement, the indicators facilitate practice and outcome evaluation of diabetes-related care and allow for comparisons across a wide variety of nursing units, programs, teams and services.

**Implications**

Local, national, and international BPSOs implementing the ‘Assessment and Management of Foot Ulcers for People with Diabetes’ clinical

practice guideline are currently measuring these quality indicators. The result of BPSO participation in NQuIRE has important implications on several levels. On the clinical level, NQuIRE supports local, practice-based quality initiatives by directing targeted improvement efforts towards indicators with robust supporting evidence of the benefits to clinical practice and outcomes. Individual providers and healthcare teams are embedding indicators into health records, using NQuIRE to monitor their progress and directing resources to activities with demonstrated linkages to improvements in the health outcomes of people with diabetes.

At the organizational level, the ability to compare guideline-based indicators of foot ulcer care and management both internally and across other organizations promotes meaningful data sharing and benchmarking. Organizational and comparative indicator data will, in turn, enable clinical decision makers to establish organizational strategies to effectively improve foot ulcer care for people with diabetes and enhance patient outcomes through RNAO BPG implementation. At the systems level, NQuIRE will allow health policy decision makers to better articulate the relationship between best practices and quality and clinical outcomes, thereby ensuring effective and evidence-based change in the healthcare system. Collectively, these impacts will emphasize the contribution of nursing to the delivery of quality care for people with diabetes and identify important areas for further investments in nursing best practices to maximize patient care and health outcomes.

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