

## Measuring the Quality of Evidence-Based Nursing Care: NQuIRE - Nursing Quality Indicators for Reporting and Evaluation Data-System

*Midiendo la calidad del cuidado de Enfermería basado en la evidencia: NQuIRE – Sistema de Indicadores de Calidad en Enfermería para reportar y evaluar*

*Avaliando a qualidade dos cuidados de enfermagem baseada em evidências: NQuIRE – Sistema de Indicadores de Qualidade na Enfermagem para Referenciar e Avaliar*

Doris Grinspun, RN., MSN., PhD., LLD (Hon.), O.ONT.,\*

Monique Lloyd, RN., PhD.\*\*

Sarah Xiao, RN., MsCN.\*\*\*

Irmajean Bajnok, RN., MScN., PhD.\*\*\*\*

### Abstract

**Introduction:** Nursing Quality Indicators for Reporting and Evaluation (*NQuIRE*) is an international quality improvement initiative to develop and sustain a data-system of nursing-sensitive quality indicators derived from recommendations within the Registered Nurses' Association of Ontario's evidence-based best practice guidelines. **Objective:** The purpose of this article is to provide an overview of the indicator database within the context of the Registered Nurses' Association of Ontario's best practice guideline program and Best Practice Spotlight Organization® Designation. Future directions for technical enhancements, quality indicator development and research within the database will also be discussed. **Topic:** Nursing Quality

Indicators for Reporting and Evaluation consists of a database, a data dictionary, including a set of organization-level structural indicators, as well as a set of process and outcome indicators for each best practice guideline, and data collection and reporting processes. **Conclusions:** The data-system collects, analyzes and reports quality indicator data submitted by health-care service and academic organizations participating in the Registered Nurses' Association of Ontario's Best Practice Spotlight Organization® Designation. [Grinspun D, Lloyd M, Xiao S, Bajnok I. *Measuring the Quality of Evidence-Based Nursing Care: NQuIRE - Nursing Quality Indicators for Reporting and Evaluation Data-System. MedUNAB 2015; 17(3): 170-175.*

**Keywords:** Quality Indicators; Health Care; Nursing; Quality Improvement; Evidence-based Practice; Practice Guideline.

\* Registered Nurse, Master of Science in Nursing, Doctor of Philosophy, Doctor of Law (hon). Chief Executive Officer, and Best Practice Guidelines Program Founder, Registered Nurses' Association of Ontario

\*\* Registered Nurse, Doctor of Philosophy. (Former) Associate Director, Guideline Development, Research and Evaluation, International Affairs and Best Practice Guidelines Centre, Registered Nurses' Association of Ontario

\*\*\* Registered Nurse, Master of Science in Nursing, Manager, Research and Evaluation, International Affairs and Best Practice Guidelines Centre, Registered Nurses' Association of Ontario

\*\*\*\* Registered Nurse, Master of Science in Nursing, Doctor of Philosophy. Director, International Affairs and Best Practice Guidelines Centre, Registered Nurses' Association of Ontario

**Corresponding author:** Doris Grinspun Registered Nurses' Association of Ontario, 158 Pearl Street, Toronto, ON Canada M5H 1L3 E-mail: dgrinspun@mao.ca

## Resumen

**Introducción:** El sistema de indicadores de calidad en enfermería para reportar y evaluar (*NQuIRE*) es una iniciativa internacional de mejoramiento de la calidad para desarrollar y sostener un sistema de datos de indicadores de calidad de enfermería derivados de las recomendaciones de guías de buenas prácticas basadas en la evidencia de la Asociación de Enfermeras Profesionales de Ontario.

**Objetivo:** El propósito de este artículo es ofrecer un panorama de la base de datos de indicadores dentro del contexto del programa de guías de buenas prácticas de enfermería de la Asociación de Enfermeras Profesionales de Ontario y el programa de centros comprometidos con la Excelencia en Cuidados. Futuras directrices para el mejoramiento técnico, desarrollo e investigación de los indicadores de calidad en la base de datos también serán discutidos. **Desarrollo del tema:** El Sistema de Indicadores de Calidad en Enfermería para Reportar y Evaluar consta de una base de datos, un diccionario de datos que incluye un conjunto de indicadores estructurales a nivel de la organización, además de un conjunto de indicadores de procesos y resultados para cada guía de mejores prácticas, y procesos de recopilación y reporte de datos. **Conclusiones:** El sistema de datos recopila, analiza e informa los datos sobre indicadores de calidad presentados por las organizaciones académicas y de servicio de atención médica que participan en el programa de designación como Centro Comprometido con la Excelencia en Cuidados de la Organización de Enfermeras Profesionales de Ontario. [Grinspun D, Lloyd M, Xiao S, Bajnok I. *Midiendo la calidad del cuidado de enfermería basado en la evidencia: NQuIRE – Sistema de Indicadores de Calidad en Enfermería para reportar y evaluar. MedUNAB 2015; 17(3): 170-175.*]

**Palabras clave:** Indicadores de Calidad de la Atención de Salud; Enfermería; Mejoramiento de la Calidad; Práctica Clínica Basada en la Evidencia; Guía de Práctica Clínica.

## Introducción

Measuring and evaluating the quality of patient care is critical to influencing positive change in health-care practice and patient outcomes. According to the definition of the World Health Organization (1), quality of care is the degree to which health services for individual service users and whole communities is efficient, effective, accessible, patient-centred, equitable and safe. The evaluation of patient care, and in turn health-care quality, is most often and most reliably measured using quality indicators (2). Quality indicators are measurable items of quality and patient safety compiled from patient data that indicate potential areas of practice that need further review and investigation (3). These indicators allow organizations to monitor and measure performance, progress and change over time to assess and improve patient care. However, there are several concerns in quality measurement common to many health-care domains. For example, the availability of data often determines the indicators for evaluations of quality improvement implementation. Organizations cannot effectively improve care when indicators of quality

## Resumo

**Introdução:** O Sistema de Indicadores da Avaliação de Qualidade na Enfermagem é uma iniciativa internacional de melhoria na qualidade para promover e manter um sistema de dados de indicadores de qualidade na enfermagem decorrentes das recomendações de diretrizes de melhores práticas baseadas em evidências da Associação das Enfermeiras Profissionais de Ontario, no Canadá\*.

**Objetivo:** O objetivo deste artigo é fornecer uma visão geral do banco de dados de indicadores no contexto do Programa das Guias\* de Boas Práticas na Enfermagem da Associação de Enfermeiras Profissionais de Ontario e o Programa dos Centros Comprometidos com a Excelência nos Cuidados. Orientações futuras para o aprimoramento técnico, pesquisa e desenvolvimento de indicadores de qualidade no banco de dados, também serão discutidos. **Temas:** O sistema de indicadores de Qualidade na Enfermagem para o Relatório e Avaliação conta com um banco de dados, um dicionário de dados que inclui um conjunto de indicadores estruturais próprio da organização, juntamente com um conjunto de indicadores de processos e resultados para cada guia de melhores práticas, e processos recopilados e dados relatados. **Conclusões:** O sistema de dados recolhe, analisa e informa os indicadores de qualidade apresentados pelas organizações acadêmicas e os serviços médicos escolhidos como Centros Comprometidos com a Excelência nos Cuidados da Organização de Enfermeiras Profissionais de Ontario. [Grinspun D, Lloyd M, Xiao S, Bajnok I. *Avaliando a qualidade dos cuidados de enfermagem baseada em evidências: NQuIRE – Sistema de Indicadores de Qualidade na Enfermagem para Referenciar e Avaliar. MedUNAB 2015; 17(3): 170-175.*]

**Palavras-chave:** Indicadores de Qualidade em Assistência à Saúde; Enfermagem; Melhoria de Qualidade; Prática Clínica Baseada em Evidências; Guia de Prática Clínica.

are selected on the basis of what is readily available rather than on the pressing issues of quality concern (4). Moreover, indicators may be chosen based on their ability to measure current or common practices, rather than evidence-based practices. Organizations that focus on indicators with questionable effects on practice and patient outcomes risk wasting resources on ineffective initiatives that do not impact patient care nor improve quality. Evaluations of the quality of care are further jeopardized when organizations measure only the outcomes, and not the practice processes or interventions related to the plan of care. This outcome-oriented approach characterizes a black-box method of intervention evaluation, whereby the actions that may have led to the observed effects are unknown. Without opening the black box, it is unclear as to what may have contributed to the changes in patient outcomes.

Effective evaluation of the quality of care should measure processes of care delivery as well as the subsequent impact on patient outcomes in a systematic and evidence-based manner. Quality indicators should be extracted from research in a transparent way and demonstrate robust supporting evidence of their benefits to clinical practice and

patient outcomes. This paper describes the work of the Registered Nurses' Association of Ontario (RNAO) to systematically measure the quality of evidence-based care with indicators derived from RNAO's best practice guidelines (BPG). Through its international data-system, Nursing Quality Indicators for Reporting and Evaluation (NQuIRE), RNAO supports organizations to make effective practice improvements by measuring evidence-based quality indicators. Following a brief overview of RNAO's Best Practice Guideline Program, the paper describes the development of NQuIRE and how it facilitates evaluation of guideline implementation in health-care organizations so that nurses can better demonstrate their impact on the quality of patient care.

## The RNAO Best Practice Guideline Program

Established in 1925, RNAO is the professional association representing registered nurses, nurse practitioners and nursing students in Ontario, Canada. RNAO's mission is to pursue healthy public policy and promote the full participation of nurses in shaping and delivering health services. RNAO is internationally recognized for positively influencing policy decisions affecting nurses and promoting nursing excellence through education programs, resources and services that support nurses in the provision of high-quality patient care.

With multi-year funding from the Ontario Ministry of Health and Long-Term Care, RNAO launched the Nursing Best Practice Guidelines Program in 1999 (5). Nursing best practice guidelines (BPG) are developed to support nurses to provide optimal patient care in all health-care settings. They do this by translating research evidence into recommendations for point-of-care practice, health professional education and organizational policy. The BPGs aim to improve the quality and consistency of nursing care, increase access to quality nursing services, reduce health-care costs, and maximize nursing, patient, organizational and health system outcomes.

RNAO BPGs are developed in collaboration with expert panel members, stakeholder groups and health-care researchers using a systematic, evidenced-based approach (6). Each guideline is based on a systematic review of scientific evidence, and recommendations are categorized into three types: 1) practice recommendations for health-care professionals; 2) recommendations for educational approaches and requirements for health-care professionals; and, 3) organization and policy recommendations to enable successful implementation of evidence-based practice. To date, RNAO has published 38 clinical guidelines and 9 healthy work environment guidelines as well as a toolkit (7) and an educator's resource (8) to support guideline implementation. The BPGs have been disseminated

internationally and many of these publications are available in multiple languages.

In addition to developing evidence-based guidelines, RNAO is committed to disseminating and supporting the uptake of its guidelines and evaluating the impact of best practices on patient, organizational and health system outcomes. As part of this commitment, RNAO formally recognizes many health-care service and academic organizations through its Best Practice Spotlight Organization<sup>®</sup> (BPSO<sup>®</sup>) Designation. BPSO Designation is initiated through a competitive application process, whereby selected organizations engage in a 3-year process to implement and evaluate the impact of multiple RNAO BPGs based on rigorous, evidence-based standards. Upon successful completion of the necessary program requirements within the initial 3-year period, organizations receive official BPSO Designation identifying them as, "one that uses evidence from the bedside to the boardroom to give the best care possible to get the best care outcomes" (9). Organizations maintain BPSO Designation by demonstrating on-going uptake, implementation and spread of RNAO's evidence-based nursing best practices.

First launched in Ontario in 2003, the RNAO BPSO Designation is now an internationally recognized award that identifies organizations as evidence-based health-care service providers and academic institutions. RNAO BPSO Designation currently includes organizations from across Canada, Spain, Australia, South Africa, Chile, Colombia and the United States. To date, there are approximately 320 sites from 76 local, national and international health-care service and academic organizations participating in the RNAO BPSO Designation.

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

Evaluating the impact of evidence-based nursing practice on patient, organizational and system outcomes is fundamental to quality improvement. In 2012, RNAO launched the NQuIRE data-system for BPSOs to systematically monitor the progress and evaluate the outcomes of implementing RNAO BPGs in their organizations. NQuIRE is an international data-system of RNAO guideline-based indicators categorized into three main types using Donabedian's framework, which includes structure, process and outcome categories (10). Structural indicators measure organizational characteristics and material resources of the setting in which nursing care is provided, including staffing, experience and level of nursing education (11). Process indicators measure what is done to and for patients during assessment, planning, and intervention, as well as the evaluation of patients' responses to nursing care. Outcome indicators describe the effects of nursing care on the health status, safety and satisfaction of

patients, the organization and the health system as a whole (11).

The structural indicators of nursing care included in NQuIRE are not guideline specific. Rather, they are selected based on the degree to which they are broadly associated with, and influence, nursing practice and patient outcomes. Structural indicators are identified through a review of the scientific and theoretical literature, consultation with experts in nursing outcomes research and an on-line search of nursing minimum data sets. From this review and consultation, six indicators of structures for nursing care were selected for inclusion in NQuIRE, including: nursing intensity, skill mix, absenteeism, turnover, level of education and nursing model of care delivery.

Process and outcome indicators for each BPG are established through a comprehensive two-stage development process. The first step, carried out in conjunction with the BPG development process, involves identifying a general list of indicators for monitoring and evaluating the guideline corresponding to the organization, the provider and the patient. For each BPG, a comprehensive systematic review is conducted to search for the available evidence that addresses the practice, education, organization and policy focus within the guideline's scope. Guideline monitoring and evaluation measures are identified and summarized from this scientific literature. The resultant list of measures is categorized according to structure, process and outcome indicators corresponding to the organization, the provider and the patient, and is published in the BPG.

The second step includes the selection and development of specific patient-related indicators for inclusion in the NQuIRE data-system. Patient-related indicators identified

by the systematic review are subjected to expert review for the strength of their supporting evidence and their sensitivity to nursing. More specifically, the process indicators are assessed on their fit within the scope of nursing practice and on their alignment to the practice recommendations within the BPG. Outcome indicators are assessed on the degree to which they are influenced by the evidence-based nursing interventions recommended by the BPG. Indicators are selected using consensus methods involving BPG expert panel members, BPSO representatives and NQuIRE users. Established health indicators in minimum data sets from across Canada, the United States and abroad are also reviewed by the team to assess their alignment with quality indicators identified from the systematic review. Aligning with existing quality measures advances the approach of collecting data once for use multiple times and for multiple purposes. These existing quality indicators may also be embedded within the information technology systems of health-care organizations, thereby facilitating consistency of indicator definitions and standardization of data collection across organizations.

The resultant process and outcome indicators are then distributed for clinical expert feedback. Expert panel members and BPSO representatives are asked to comment on the indicators' importance to practice, alignment with BPG practice recommendations, and measurement feasibility. NQuIRE researchers respond to and incorporate expert feedback, and upon final expert approval, add the BPG indicator set to the NQuIRE data-system. RAO continues to identify and develop guideline-based indicators in this manner. As of 2013, nursing quality indicators have been developed for 14 RAO clinical BPGs, with more underway. See Table 1 for a list of the BPGs included in NQuIRE.

**Table 1.** RAO best practice guidelines included in NQuIRE

Breastfeeding Best Practice Guideline for Nurses (12)	Assessment and Management of Pain(20)
Client Centred Care (13)	Risk Assessment and Prevention of Pressure Ulcers(21)
Screening for Delirium, Dementia and Depression in Older Adults (14)	Assessment & Management of Stage I to IV Pressure Ulcers (22)
Prevention of Falls and Fall Injuries in the Older Adult (15)	Strategies to Support Self-Management in Chronic Conditions: Collaboration with Clients(23)
Reducing Foot Complications for People with Diabetes (16)	Integrating Smoking Cession into Daily Nursing Practice (24)
Assessment and Management of Foot Ulcers for People with Diabetes, Second Edition (17)	Stroke Assessment Across the Continuum of Care(25)
Nursing Management of Hypertension (18) <sup>18</sup>	
Ostomy Care and Management (19) <sup>19</sup>	

## Participation in NQuIRE

NQuIRE collects data from BPSOs in all sectors including: public health, primary care, acute care, home health care, and long-term care. BPSOs submit data to the NQuIRE data-system on an on-going, quarterly basis for the indicators relevant to the BPGs they have selected for implementation. Data submitted to NQuIRE are aggregated to the area within the organization where the guideline is being implemented. In the case of a hospital, this aggregation occurs at the level of the nursing unit. In other health-care sectors, data may be aggregated to a nursing service, interprofessional team, health clinic, or clinical program. This level of aggregation is important as it allows BPSOs to compare their NQuIRE data and progress toward improving the quality of nursing care and patient outcomes among guideline implementation areas within the organization. It will also broaden the pool of comparative data by augmenting traditional organization-to-organization comparisons by enabling implementation areas to compare themselves to similar areas from different health sectors.

Once data have been submitted and processed, BPSOs are provided on-line access to quarterly reports through the NQuIRE website. All reports are interactive, customizable and downloadable. BPSO participation in NQuIRE is designed for quality improvement in that, through this process, BPSOs can learn how their evidence-based practices are impacting quality outcomes. BPSOs are able to use NQuIRE to drive quality improvement by monitoring the implementation and uptake of best practices in their organizations, evaluating progress, establishing organizational strategies for improving outcomes and supporting evidence-based decision making. The RNAO BPSO Designation also supports information and knowledge sharing across participating organizations about implementation best practices, thereby advancing the science of quality improvement.

## Future Directions

The NQuIRE data-system continues to grow with expansion of BPSO enrollment and improvements in technical function. Over the course of the next year, several system enhancements will be made to NQuIRE. The first priority is to launch the across-BPSO comparative reporting feature, allowing guideline implementation areas within a BPSO to compare themselves to similar areas. Organizations will be able to filter the pool of available indicator data in the data-system to very specific characteristics such as BPSO size, implementation area type and funding jurisdiction, as well as specific data elements within a guideline such as type of assessment instrument, measurement scale and timing of assessment. This will provide BPSOs with performance reports of local,

national, and international percentile distributions for specific data elements of interest in peer organizations.

As BPSO participation grows and organizations expand the number of guideline implementation areas collecting and submitting data to NQuIRE, interest in setting-specific indicators, particularly for the community and primary health-care sectors, is increasing. RNAO is using its diverse user group to continue to refine and validate indicator definitions to ensure applicability and validity to all relevant health-care settings. As a result, new indicators will continue to be added to the database as guidelines are developed, updated or applied in new health-care settings. This will include updates to existing nursing-sensitive process and outcome indicators such as those for pain, falls, and pressure ulcers; as well as the addition of new evidence-based process and outcome indicators derived from the wide range of clinical conditions addressed in RNAO's BPGs. RNAO is also in the midst of piloting the process of incorporating the formulation of quality indicators within the guideline development process. This will ensure that indicators for new and updated BPGs are available in the NQuIRE data-system at the time of guideline publication.

RNAO is also developing a formal authorization process which will provide researchers with opportunities to use NQuIRE data to empirically test structure-outcome, process-outcome, and structure-process-outcome relationships. We expect this research to advance the understanding of the interrelationships between nursing-related structural factors or clinical processes and patient outcomes. Researchers may also conduct cost-effectiveness studies to determine the costs and associated outcomes of evidence-based nursing practice. This research will additionally inform where and how RNAO BPGs are impacting practice and patient outcomes at the organization and system level locally, nationally and internationally.

## Conclusions

The use and interpretation of quality indicators can have significant consequences for decision makers, health-care providers, and patients alike. Unfortunately, indicator development and measurement are not often carried out in a systematic and evidence-based manner. In addition, nursing's contribution to quality improvement is rarely visible in evaluations of the quality of patient care. The RNAO's evidence-based guidelines underline the importance of quality nursing care to optimizing patient outcomes. NQuIRE's guideline-based indicators, coupled with the commitment of BPSOs to systematically implement, evaluate and spread evidence-based practice through the use of RNAO BPGs, will highlight nursing's active contribution to safe, quality patient care and promotion of system-wide health-care transformation.

## Conflict of interests

The authors state that they have no conflict of interest.

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