

# Measuring quality of care: considering conceptual approaches to quality indicator development and evaluation

Henry T. Stelfox<sup>a,b,c,\*</sup>, Sharon E. Straus<sup>d</sup>

<sup>a</sup>Department of Critical Care Medicine, Institute for Public Health, University of Calgary, Teaching Research & Wellness Building, 3280 Hospital Drive NW, Calgary, Alberta, Canada T2N 4Z6

<sup>b</sup>Department of Medicine, Institute for Public Health, University of Calgary, Teaching Research & Wellness Building, 3280 Hospital Drive NW, Calgary, Alberta, Canada T2N 4Z6

<sup>c</sup>Department of Community Health Sciences, Institute for Public Health, University of Calgary, Teaching Research & Wellness Building, 3280 Hospital Drive NW, Calgary, Alberta, Canada T2N 4Z6

<sup>d</sup>Department of Medicine, Li Ka Shing Knowledge Institute of Saint Michael's Hospital, University of Toronto, Toronto, Ontario, Canada

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## Abstract

**Objective:** In this article, we describe one approach for developing and evaluating quality indicators.

**Study Design and Setting:** We focus on describing different conceptual approaches to quality indicator development, review one approach for developing quality indicators, outline how to evaluate quality indicators once developed, and discuss quality indicator maintenance.

**Results:** The key steps for developing quality indicators include specifying a clear goal for the indicators; using methodologies to incorporate evidence, expertise, and patient perspectives; and considering contextual factors and logistics of implementation. The Strategic Framework Board and the National Quality Measure Clearinghouse have developed criteria for evaluating quality indicators that complement traditional psychometric evaluations. Optimal strategies for quality indicator maintenance and dissemination have not been determined, but experiences with clinical guideline maintenance may be informative.

**Conclusion:** For quality indicators to effectively guide quality improvement efforts, they must be developed, evaluated, maintained, and implemented using rigorous evidence-informed practices. © 2013 Elsevier Inc. All rights reserved.

**Keywords:** Quality of health care; Quality indicators; Health care; Consensus; Models; Theoretical; Reproducibility of results

## 1. Introduction

This is the second manuscript in a two-part series to describe the major steps necessary to develop and evaluate quality indicators to measure and manage the quality of patient care. In the first manuscript, we defined quality indicators, examined how to develop a conceptual measurement framework, and reviewed how to perform a quality indicator needs assessment. In the present manuscript, we will address the following questions:

- What are the conceptual approaches to developing quality indicators?
- How to develop indicators using available evidence (even if limited or contradictory)?
- What should be considered when evaluating the quality indicators that are developed?

- When and how should quality indicators be updated?
- How to get your quality indicators used?

We will use the specific example of quality of injury care to illustrate some of the choices faced by the developers of quality measures.

## 2. Conceptual approaches to developing quality indicators

There are two broad approaches that have been used to develop quality indicators, namely a deductive approach (from concept to data) and an inductive approach (from data to concept) [1–3].

A review of the literature suggests that most quality indicators have been developed using a deductive approach where conceptually important quality-of-care concepts are used to guide quality indicator development (from concept to data). Using this approach, quality indicators should be

\* Corresponding author. Tel.: +403-944-2334; fax: +403-283-9994.  
E-mail address: [tstelfox@ucalgary.ca](mailto:tstelfox@ucalgary.ca) (H.T. Stelfox).

### What is New?

- Two broad approaches that have been used to develop quality indicators; a deductive approach (from concept to data) and an inductive approach (from data to concept)
- Consensus methods can help bridge an inconclusive evidence base and clinical practice when developing indicators, but consideration needs to be given to:
  - Composition of the expert panel
  - Establishment of criteria for indicator development
  - Process for selecting indicators
  - Establishment of indicator definitions and codes
- Quality indicator development should not be considered a one-time event and consideration needs to be given to measure maintenance.

directly derived from scientific evidence; the stronger the evidence the stronger the rationale and potential benefit of a given indicator. For example, timeliness of primary percutaneous coronary intervention or “door-to-balloon” time for myocardial infarction is supported by both physiological and clinical evidence [4], is publicly reported [5], and serves as a focus for quality improvement initiatives [6]. However, in many areas of health care, the scientific evidence base is limited. This situation requires using a broader array of evidence that includes expert opinion. In such circumstances, using the existing evidence base to guide expert opinion is a commonly used approach. For example, in injury care, it is recognized that timely evaluation of the spine in patients at risk for spine injuries is important because it may reduce complications associated with spinal immobilization (e.g., pressure ulcers), but the optimal method and timeframe for evaluation have not been established [7]. Therefore, in developing a quality indicator for spine evaluation, the Injury Quality Indicator Consensus Panel elected to develop a quality indicator designed to encourage timely evaluation of the spine, but did not specify the evaluation technique (e.g., clinical evaluation, radiographic evaluation, and so on) [8]. The strengths of a deductive approach to quality indicator development are that it is based on key quality-of-care concepts (e.g., pressure ulcers are an adverse event that may be preventable), best available evidence (e.g., pressure ulcers can be reduced by timely spine evaluation) and not restricted by potential barriers to measurement (e.g., how are we doing to get the data) [9]. Furthermore, this approach can help identify gaps within existing measurement approaches and plan for

future needs (e.g., developing new data sources). The primary limitation of this approach is that data may not exist to allow measurement of implementation. In addition, measures may be developed for conceptually important quality-of-care issues (e.g., pressure ulcers) that are no longer important (e.g., low incidence of pressure ulcers owing to new technologies) or are specified in a fashion that fails to capture the problem in a manner that is useful to the end user (e.g., not distinguishing preexisting from newly acquired pressure ulcers) [2].

A smaller number of studies have described using an inductive approach to quality indicator development where quality-of-care data are used (from data to concept). This involves identifying existing data sources, evaluating the data elements, and querying the data for variation that is then used to develop a quality indicator. Many institutions when performing quality assurance use this quality measurement approach. For example, it is common for trauma centers to query their injury registries to identify variation in practice patterns (e.g., chest tube placement) or patient outcomes (e.g., pneumothorax) and develop quality indicators in response to local problems (e.g., poorly placed chest tubes) for monitoring and evaluation of interventions (e.g., development of a trainee education module) [10]. A potential strength of using an inductive approach is that it is efficient. It uses existing data and existing variation to guide quality indicator development. For example, data mining has been used to identify better processes of care (e.g., laparoscopy techniques in gynecologic surgery) [11] and inequalities of care [12] that warrant monitoring and corrective action [13]. Furthermore, an inductive approach may provide a mechanism for addressing the concerns of providers who may feel that indicators are developed by “experts” and indiscriminately applied to community hospitals and community-based practice without considering the clinical realities of patient care [14]. By demonstrating variation in processes and outcomes of care, providers may be willing to accept measures to explore and track that variation.

Finally, a third approach is to jointly use both deductive and inductive methodologies. Using this approach, quality indicators are derived from the best available scientific evidence, but data availability and variability are carefully considered during development. This approach is advocated by the Agency for Healthcare Research and Quality (AHRQ). For example, in 1994, the AHRQ created 33 quality indicators as part of the Healthcare Cost and Utilization Project by using quality-of-care concepts described in the literature and administrative data available through the National Inpatient Sample [15]. With this approach, measures are developed to evaluate important concepts for which data are available. Before implementation, the indicators can be subject to inductive evaluation where variation in processes and outcomes of care in domains evaluated by the indicators is examined. Indicators that capture important variation are then further refined and developed, whereas those that fail to identify important variation (defined by the end users)

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