Building an infrastructure to improve cardiac rehabilitation: from guidelines to audit and feedback
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Citation for published version (APA):
Verheul, M. M. (2016). Building an infrastructure to improve cardiac rehabilitation: from guidelines to audit and feedback

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MODIFIED RAND METHOD TO DERIVE QUALITY INDICATORS: A CASE STUDY IN CARDIAC REHABILITATION

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ABSTRACT

Quality indicators (QIs) are increasingly used to summarize quality of care and to give professionals’ performance feedback. We have previously developed a continuous multifaceted guideline implementation strategy that integrates computerized decision support with feedback on QIs and benchmarking. This paper focuses on development of QIs, and presents results of a case study in the field of cardiac rehabilitation. We present a modified Rand method that combines results from a literature search and guideline review with knowledge of an expert and patient panel in an extensive rating and consensus procedure. All sources contributed to the final set of 18 QIs for cardiac rehabilitation.

Key words. Quality Indicators, Health Care; Cardiac Rehabilitation
INTRODUCTION

Improving quality and outcomes of care is a central theme in current health care policy. Clinical practice guidelines are considered essential instruments to improve the quality of care as their potential benefits are improved patient outcomes, reduced practice variation, and reduced costs. Despite wide promulgation however, professionals’ often do not follow guideline recommendations. A frequently used classification of barriers to guideline implementation is a division into individual (‘internal’) and environmental (‘external’) barriers [1]. Internal barriers relate professional’s knowledge and attitude towards guidelines. To improve these, computerized decision support (CDS) is known to be effective because it can provide guideline-based recommendations at the time and place where clinical decisions are made [2]. However, medicine is largely practiced as part of a team and embedded within complex organizations. Professionals may also encounter external barriers which hamper their ability to execute guidelines. They stem from environmental factors related to the team, organisation or health system they work in. It is therefore important to apply an implementation strategy with supplementary components directed at both internal and external barriers [1].

Feedback on health care performance and outcomes has been shown to be an effective quality improvement method to overcome external barriers and can be used in addition to CDS [3]. It prompts professionals to change their behaviour if they receive feedback that their practice does not meet benchmark values (e.g., national target values or average performance within a peer group). Feedback reports contain results on quality indicators (QIs), i.e. quantitative measures to monitor and evaluate the quality of particular health care processes that affect patient outcomes [3]. QIs help professionals and their managers to identify suboptimal care and opportunity to improve quality and outcomes of care. Several methods exist for developing QIs, each with strengths and limitations. The first goal of this paper is to present a comprehensive method, which combines strengths from multiple methods to develop a QI set. The second goal is to apply our method and present a QI set developed during a case study in the field of cardiac rehabilitation (CR).

METHODS

To develop a QI set, a procedure developed by the Rand Corporation [4] is often used. Like other QI development methods this procedure combines scientific evidence and expert opinion using a consensus technique. Preliminary QIs extracted from the literature are anonymously rated by an expert panel. In a next round the panel meets to discuss, rerate and gain consensus. Criticisms of the Rand procedure include the lack of transparency in applying the definition of appropriate care, and weak reliability of the rating and consensus procedures. Also the lack of patient involvement and the fact that clinical practice guidelines are not consulted are mentioned [5].

To overcome these criticisms, we have modified the Rand procedure with successful elements of rating and consensus procedures from other QI development methods. First
we defined appropriate care based on specific judgement criteria from the Organisation for Economic Co-operation and Development (OECD) [6]. Secondly we increased the reliability of the rating procedure by using a 5-point Likert scale for each criterion, as is often used in the Delphi technique [7]. Thirdly we structured the consensus procedure during the discussion meeting of the expert panel by applying the Nominal Group Technique (NGT) [8]. Finally we extended the number of consulted sources for QIs, adding a patient panel and review clinical practice guidelines in CR.

Case study – We applied our modified Rand method to the field of CR. CR is a multidisciplinary therapy to support heart patients recover from a cardiac incident or intervention, and aims to improve their overall physical, mental and social functioning. Consistent with international guidelines, the Dutch guidelines for CR state that patients should be offered an individualized rehabilitation programme based on a needs assessment procedure. The guidelines mention all items which need to be collected during this procedure. An EPR with CDS facilities, based on the guidelines, was developed to overcome internal barriers and evaluated in a cluster randomized trial. It was shown that CDS considerably improved guideline adherence. However, the trial also revealed persisting barriers for implementation of the guidelines at organisational levels [9]. To overcome also these external barriers we developed a multifaceted guideline implementation strategy, which expands our CDS intervention with a benchmark-feedback loop including feedback reports on QIs [10].

RESULTS

The modified Rand method (see Figure 1) consists of consultation of four sources (experts, patients, literature and guidelines) to collect information QIs. This is translated into a draft QI set which is rated on paper by the expert panel. Finally the expert panel meets to discuss and gain consensus on the final QIs. The steps in Figure 1 will be described in more detail now, followed by their application in the case study.

Expert and Patient Panel – A questionnaire about quality characteristics is sent to consult both an expert panel and a Patient Panel. The expert panel should include professionals from all disciplines involved in the field of interest. They are asked to mention characteristics of excellent care service and what they would need to know about another clinic to assess their quality. The Patient Panel is asked to describe positive and negative experiences during their treatment. From the answers provided by experts and patients, quality characteristics of the health services are abstracted.
**Literature Search** – Search terms concerning the field of interest (e.g., CR), are combined with MeSH terms and keywords referring to quality assurance, process and outcome assessment or quality indicators. From all included articles QIs and outcome measures related to high quality of the health service are abstracted.

**Review of Guidelines** – The prevailing guidelines in the field of interest are reviewed to identify procedural and structural properties of high quality health services. Guidelines do not often describe a desirable level of outcomes of care but they do mention minimum procedures, standards and facilities that services should include.

**Case study:** We invited 40 Dutch experts to our expert panel of whom 38 agreed to participate. The experts included professionals from all disciplines involved in CR (cardiologists, rehabilitation and sport physicians, company doctors, nurse practitioners, physiotherapists, psychologists, social workers, dieticians, and CR managers). Also we asked 30 patients of four CR clinics to take place in the patient panel of whom 15 participated. Overall, 92 different quality characteristics of CR were mentioned. The PubMed search identified 314 articles in which 15 QIs and 24 different outcome measures of CR services were mentioned. Most frequently used outcome measures related to exercise therapy and quality of life. Few outcome measures related to patient satisfaction and professional performance. Furthermore, the CR guidelines in the Netherlands were reviewed, from which we extracted 34 procedural quality characteristics and three structural properties of CR services.

**Translation of Results** – The results of the four sources are translated into a draft QI set using the OECD framework on QIs [6]. This framework describes how concepts of health care should be measured by grouping them into dimensions and formulate them according criteria of importance, scientific soundness and feasibility.

**Rating on Paper** – The draft QI set is presented to the expert panel. They rate all QIs on a Likert scale from 1 (total disagreement) to 5 (total agreement) based on three criteria: (i) The QI has a clear relationship with one or more patient outcomes; (ii) The QI can be a departure point for improvement actions; (iii) Information regarding the QI is easy to record [6]. For each QI the mean score per criterion, the standard response levels of individual experts. The rated QI set is ranked and shortened by mean score.
Case study: Based on the four sources we assembled a draft set of 81 quality QIs for CR. The draft set was structured into four clusters reflecting the chronological phases of CR (referral, needs assessment, evaluation, and follow-up) and one cluster concerning organization of care. In each cluster the QIs were classified as relating to either process, structure, or outcomes of care. Twenty-two experts rated the draft QI set. The highest ranked QI (patient’s lifestyle is assessed during needs assessment for CR) had a mean overall score of 4.47. The lowest ranked QI (CR patients improve their cognitive functioning) had a score of 2.94.

Group Discussion – The NGT is used to lead the expert panel towards consensus through rounds of debate, discussion and an anonymous voting process [8]. Input for the discussion is the ranked QI set, the experts discuss the set and select the final QIs.

Case study: We presented the QIs with their ranks, structured into clusters, to the expert panel. The panel voted for the QIs they preferred in an anonymous voting procedure. The results were shown on a screen and discussed. After hearing different opinions, the panel voted again in the light of the discussion to gain consensus. The final QI set and their original sources are presented in Table 1.
### Table 1 – Final QI set for CR (E= Expert panel, P= Patient panel, L= Literature and G= Guidelines).

<table>
<thead>
<tr>
<th>Nr</th>
<th>Type</th>
<th>Quality indicator</th>
<th>Source</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Outcome</td>
<td>Patients improve their exercise capacity during rehabilitation</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>2</td>
<td>Outcome</td>
<td>Patients improvement their quality of life during rehabilitation</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>3</td>
<td>Outcome</td>
<td>Amount of time needed to start resumption of work</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>4</td>
<td>Outcome</td>
<td>Patients quit smoking</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>5</td>
<td>Outcome</td>
<td>Patients meet the physical activity norms</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>6</td>
<td>Process</td>
<td>Average time between hospital discharge and start of rehabilitation</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>7</td>
<td>Process</td>
<td>Complete data collection during needs assessment for rehabilitation</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>8</td>
<td>Process</td>
<td>Patients are offered a rehabilitation programme tailored to their needs</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>9</td>
<td>Process</td>
<td>Patients finish their rehabilitation programme</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>10</td>
<td>Process</td>
<td>Rehabilitation goals are evaluated afterwards</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>11</td>
<td>Process</td>
<td>Cardiovascular risk profile is evaluated afterwards</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>12</td>
<td>Process</td>
<td>Patients receive a discharge letter</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>13</td>
<td>Process</td>
<td>Cardiologists receive a report after the rehabilitation</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>14</td>
<td>Structure</td>
<td>Rehab professionals work with a multidisciplinary patient record</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>15</td>
<td>Structure</td>
<td>Specialized education for patients with chronic heart failure</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>16</td>
<td>Structure</td>
<td>Long-term patient outcomes are assessed</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>17</td>
<td>Structure</td>
<td>Clinics perform internal evaluations and quality improvement</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
<tr>
<td>18</td>
<td>Structure</td>
<td>Patients participate in patient satisfaction research</td>
<td>E</td>
<td>P</td>
<td>L</td>
<td>G</td>
</tr>
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</table>

### DISCUSSION

In the current study we modified the Rand method to develop QIs for measuring and reporting on quality of care. In our method results from a literature and guideline search are combined with the knowledge of an expert and patient panel in an extensive rating and consensus procedure. We applied our method to the field of CR, where the final QIs set showed that the four sources are complementary. We believe that using all sources results in a well-founded QI set covering all aspects of the health service of interest. Notably, the expert panel mentioned only few QIs related to outcomes of care. Furthermore, many QIs mentioned by the patient panel did not make it to the final QI set because they were opinion-based (e.g., friendly treatment). Our experience with the multidisciplinary expert panel during the group discussion was positive. Because of the early involvement and the reflection of all disciplines in CR, the panel showed great commitment to the QI development process. We believe this will ease implementation and acceptability of the final QI set in daily practice. However, actual benefits (quality improvement) and costs (registration time) can only be assessed afterwards.
To improve the data collection needed to report on QIs, the QI database should ideally be linked to an already existing data collection system such as an EPR. The next step in our research project is to implement the QI set in all clinics that already use an EPR for CR with CDS functionalities. During a multicenter randomized clinical trial the clinics will also receive feedback on the developed QI set in combination with educational meetings to overcome both internal and external barriers for guideline implementation. We expect that our modified Rand method to develop QIs can also be applied in other medical domains to further improve quality and outcomes of care.

ACKNOWLEDGEMENTS

The authors would like to thank the Committee for Cardiovascular Prevention and Rehabilitation of the Netherlands Society of Cardiology and the National Multidisciplinary Assembly on Cardiac Rehabilitation for their contribution to the development of QIs for CR.
REFERENCES


