

APPENDIX 2 – QI-MQCS MANUAL

QUALITY IMPROVEMENT MINIMUM QUALITY CRITERIA SET (QI-MQCS) – VERSION 1.0 USER MANUAL



Overview

The purpose of the Quality Improvement Minimum Quality Criteria Set (QI-MQCS) is to assist in the assessment of quality improvement intervention evaluations in healthcare reported in scientific literature. The QI-MQCS domains were selected by a stakeholder panel informed by literature and represent core aspects important to quality improvement. The QI-MQCS tool builds upon methods that identify and classify quality improvement and continuous quality improvement publications.¹⁻⁴

The 16 domains have been operationalized and psychometrically tested to allow a reliable and valid assessment. The QI-MQCS provides concrete scoring guidance and states minimum standards for each item to differentiate whether criteria have been met. The tool was developed to be applicable to a broad range of quality improvement intervention evaluations in healthcare. The QI-MQCS domains provide a framework to structure the assessment. The tool was designed and tested using a dichotomous answer mode (criterion met versus not). However, the framework can be used to differentiate the critical appraisal further, e.g., to distinguish partially met criteria; for this purpose, literature reviewers have to define the minimum standard of the additional answer mode.

Prior to rating a publication, reviewers should agree on the intervention and the primary outcome of interest described in the publication. The following sections are provided in this manual: the domain *Title*, a short *Description* of the domain, *What to Consider*, *Where to Look*, and *How to Rate* for each domain of the QI-MQCS. *Where to Look* directs users to where the information is typically found, but contains suggestions rather than an exclusive list of possible sections. Publications reporting on quality improvement intervention evaluations, patient health outcomes, and potentially enduring organizational changes were used in the design and validation of the QI-MQCS and example article excerpts relevant to each domain are provided.

References

1. Rubenstein LV, Hempel S, Farmer MM, et al. Finding order in heterogeneity: types of quality-improvement intervention publications. *Quality & Safety in Health Care* 2008;**17**(6):403-8.
2. Danz MS, Rubenstein LV, Hempel S, et al. Identifying quality improvement intervention evaluations: is consensus achievable? *Qual Saf Health Care* 2010;**19**(4):279-83.
3. Hempel S, Rubenstein LV, Shanman RM, et al. Identifying quality improvement intervention publications--a comparison of electronic search strategies. *Implement Sci* 2011;**6**:85.
4. O'Neill SM, Hempel S, Lim YW, et al. Identifying continuous quality improvement publications: what makes an improvement intervention 'CQI'? *BMJ Qual Saf* 2011;**20**(12):1011-9.

DOMAIN 1. ORGANIZATIONAL MOTIVATION

Description

Organizational problem, reason, or motivation for the intervention

What to Consider

Consider quality of care problems, organizational problems, regulations, legal constraints, and external financial incentives at the target organization; or organizational motivation.

Where to Look

Examine the introduction and background paragraphs. This information may be referred to in the description of purpose, objectives, or scope.

How to Rate

Minimum standard: Names or describes at least one reason or motivation for the organization's participation in the intervention

Examples

- “At Jefferson Medical College, clinical efficiency and bed availability are important priorities to the Department of Medicine (DOM). To this end, in 2002, a multidisciplinary program was designed; this initiative was led by the DOM...”
Feldman et al. 2006. The physician-hospital team: a successful approach to improving care in a large academic medical center. This publication meets the minimum standard because the priorities of the Department of Medicine are one reason for the organization's participation in the intervention.
- “The rationale to improve medication management in response to current national fiscal, clinical, and external quality measures and evolution of this process in the agency is detailed.”
Atkinson et al. 2005. Integration of a medication management model into outcome-based quality improvement: a pilot program in a rural proprietary home healthcare agency. This publication meets the minimum standard because the organization's participation was in response to national fiscal, clinical, and external quality measures.

DOMAIN 2. INTERVENTION RATIONALE

Description

Rationale linking the intervention to its expected effects

What to Consider

Consider citations of theories, logic models, or existing empirical evidence that links the intervention to its expected effects.

Where to Look

Examine the opening paragraphs and introduction. Examples of commonly labeled sections include background, introduction, and literature review.

How to Rate

Minimum standard: Names or describes a rationale linking at least one central intervention component to intended effects

Examples

- “Use of a fast track for less urgent patients (CTAS 4/5) has been shown to improve the ED flow and reduce the rate of patients who leave without being seen by a physician (LWBS) [4,10].”

Al Darrab et al. 2006. How does fast track affect quality of care in the emergency department? This publication meets the minimum standard because references to empirical evidence supporting the intervention are given.

- “A review of case management worldwide has revealed a median case fatality rate of ~25%, with rates in some hospitals as high as 50% [2]. Many of these deaths are avoidable and are due to outdated procedures and protocols, and unfamiliarity with modern practices of management. Centres that improved their treatment of malnutrition have successfully reduced the death rate to <10% [3,4]. This suggests the need to motivate health practitioners to review current practices in the management of severely malnourished children in paediatric wards, and to adopt practices that will improve the quality of care.”

Puoane et al. 2004. Improving the hospital management of malnourished children by participatory research. This publication meets the minimum standard because references to empirical evidence supporting the intervention are given.

DOMAIN 3. INTERVENTION DESCRIPTION

Description

Change in organizational or provider behavior

What to Consider

Consider the presented details that describe the change in the delivery of care, provider behavior, or structure of the organization needed to replicate the evaluated intervention including the involved key personnel.

Where to Look

Examine the title and abstract first. This information may also be found in the introduction or methods sections.

How to Rate

Minimum standard: Describes at least one specific change in detail including the personnel executing the intervention

Examples

- “We implemented a medical emergency team (MET) in our free-standing children’s hospital.... The MET was defined as experienced clinicians dispatched to evaluate and triage patients who were perceived as having a declining clinical status.... This team would arrive within 15 mins after activation. MET functions included assessment, stabilization if necessary, and triage of general care floor patients to the most appropriate unit in the hospital.”

Brilli et al. 2007. Implementation of a medical emergency team in a large pediatric teaching hospital prevents respiratory and cardiopulmonary arrests outside the intensive care unit. This publication meets the minimum standard because the MET intervention and the personnel involved were described.

- “...an integrated program of task-shifting among providers. Appropriate health care responsibilities have been transferred from physicians to mid-level clinicians (e.g., nurses and clinical officers) and from nurses to community health workers.... The task-shifting model requires the transfer of specific clinical responsibilities to other providers who can be trained for the task (Figure 1).”

Morris et al. 2009. Use of task-shifting to rapidly scale-up HIV treatment services: experiences from Lusaka, Zambia. This publication meets the minimum standard because the task-shifting intervention and the personnel involved were described.

DOMAIN 4. ORGANIZATIONAL CHARACTERISTICS

Description

Demographics or basic characteristics of the organization

What to Consider

Consider environment (e.g., urban/rural, academic/non-academic), type of care (e.g., primary care), size of the organization, patient mix, staff mix, or reimbursement type.

Where to Look

Examine the introduction, design, and methods sections. Examples of commonly labeled sections include background, research design, methods, setting, population, and participants.

How to Rate

Minimum standard: Reports at least two organizational characteristics

Examples

- “The Sutherland Hospital is a district hospital serving The Sutherland Shire, a metropolitan area of Sydney. It has a population of approximately 220,000, which is predominantly Anglo-Saxon in ethnic origin. The Emergency Department (ED) provides emergency services for 30,000 new patients per annum. Of these 6500 presentations are between the ages of 0 and 16 years. There have been 913 paediatric asthma presentations between January 1999 and December 2001.”
Studdert et al. 2005. Introduction of standardised emergency department paediatric asthma clinical guidelines into a general metropolitan hospital. This publication meets the minimum standard because the environment (metropolitan area), number of patient served is an indicator of the size of the organization, and patient mix are provided.
- “Implementation of a medical emergency team in a large pediatric teaching hospital...”
Brilli et al. 2007. Implementation of a medical emergency team in a large pediatric teaching hospital prevents respiratory and cardiopulmonary arrests outside the intensive care unit. This publication meets the minimum standard because the size of the organization (large), patient type (pediatric), and the context (teaching hospital) are described.

DOMAIN 5. IMPLEMENTATION

Description

Temporary activities used to introduce potentially enduring organizational / structural changes

What to Consider

Consider types of staff involved, activities or methods used such as pilot testing or Plan-Do-Study-Act (PDSA) cycles, staff education, and involvement of stakeholders in introducing the intervention.

Where to Look

Examine the design and methods sections.

How to Rate

Minimum standard: Names at least one approach used to introduce the intervention

Examples

- “Unexpected health needs were identified during the piloting of the project...”
Harrison et al. 2006. Valuing people: health visiting and people with learning disabilities. This publication meets the minimum standard because piloting was used to introduce the intervention.
- “We advocate a comprehensive, three-pronged approach to task-shifting that comprises training, on-site clinical mentoring, and continuous quality assurance.”
Morris et al. 2009. Use of task-shifting to rapidly scale-up HIV treatment services: experiences from Lusaka, Zambia. This publication meets the minimum standard because it describes approaches (training, mentoring) to introduce the intervention.

DOMAIN 6. STUDY DESIGN

Description

Study design and comparator

What to Consider

Consider the type of evaluation (e.g., post-only, pre-post, time series, historic or parallel control group, randomized groups; same participants assessed multiple times or different samples) / how the authors evaluated whether the intervention worked.

Where to Look

Examine the title, abstract, introduction, and methods sections.

How to Rate

Minimum standard: Names the study design

Examples

- “A before-after intervention comparison analysis was completed...”
Al Darrab et al. 2006. How does fast track affect quality of care in the emergency department? This publication meets the minimum standard because the design was reported (before-after comparison).
- “**Study design:** Quasi-experimental with concurrent, but non-randomised controls...”
Kirsh et al. 2007. Shared medical appointments based on the chronic care model: a quality improvement project to address the challenges of patients with diabetes with high cardiovascular risk. This publication meets the minimum standard because the study design was reported (quasi-experiment).

DOMAIN 7. COMPARATOR

Description

Information about the comparator care processes

What to Consider

Consider details about the control group or the status quo without the intervention (even if there was no formal control group / data), e.g., the existing standard of care / routine care / before the intervention was introduced, or care processes used in the control group.

Where to Look

Examine the introduction and discussion sections.

How to Rate

Minimum standard: Describes at least one key care process

Examples

- “Prior to the introduction of our RRT <rapid response team>, no specific system was in place for emergent triage, assessment, and expedited treatment of off-unit patients, outpatients, and visitors.”
King et al. 2006. Establishing a rapid response team (RRT) in an academic hospital: one year’s experience. This publication meets the minimum standard because the status quo prior to the intervention is described.
- “This was a randomized controlled trial examining the combination of audit with feedback and benchmarking, academic detailing, practice facilitation, and IT [information technology] support compared with feedback and benchmarking alone on implementation of wellness visits, recall and reminder systems, and standing orders in primary care practices (Figure 1).”
Mold et al. 2008. Implementation of evidence-based preventive services delivery processes in primary care: an Oklahoma physicians resource/research network (OKPRN) study. This publication meets the minimum standard because the care processes in the comparison group (feedback and benchmarking alone) are described.

DOMAIN 8. DATA SOURCE

Description

Data sources and outcome definition

What to Consider

Consider the data sources (e.g., routine hospital data, data collected by the study investigator), the data collection method (e.g., survey, interview, objective/subjective measurement), and the definition of the outcome of interest (e.g., definition of a reportable patient fall).

Where to Look

Examine the design and methods sections.

How to Rate

Minimum standard: Describes the data source and defines the outcome of interest

Examples

- “A respiratory reference group at Sydney Children’s Hospital collected and collated data relating to paediatric asthma management across SESAHS.”
Studdert et al. 2005. Introduction of standardised emergency department paediatric asthma clinical guidelines into a general metropolitan hospital. This publication meets the minimum standard because data collection and the personnel involved was described.
- “As shown in Figure 2 (page 29), mean patient satisfaction scores related to pain (as measured on our standard patient satisfaction survey administered by mail following discharge*)...”
Paice et al. 2006. Creating organizational change through the pain resource nurse program. This publication meets the minimum standard because the data collection method (survey) was described.

DOMAIN 9. TIMING

Description

Timing of intervention and evaluation

What to Consider

Consider the clarity of the timeline of the intervention, e.g., when introduced, when fully implemented, when evaluated relative to the intervention implementation status, and a clear indication of whether baseline data (defined as before the intervention was introduced) was present.

Where to Look

Examine the methods, results, tables, and figures.

How to Rate

Minimum standard: Describes the timing of the intervention and evaluation to determine the presence of baseline data and the follow-up period after all intervention components were fully implemented

Examples

- “...St. John’s, in collaboration with its surgeons, set aside an operating room as a trial project in November 2002....After approximately three months of segmenting this room as an “add-on” room, the data were reassessed....the number of surgical cases increased by 5.1 percent.”
Henderson et al. 2003. A case study of successful patient flow methods: St. John’s Hospital. This publication meets the minimum standard because the baseline and follow-up periods can be determined.
- “The preintervention period was between January 1, 2004, and August 31, 2005, and the postintervention period, defined for identical time duration and seasonality, was between January 1, 2006, and August 31, 2007. Staff education and rapid response team program rollout occurred from September 1 to December 31, 2005, and patient data from this period was excluded.” [Note: pre-intervention data provided in a table.]
Chan et al. 2008. Hospital-wide code rates and mortality before and after implementation of a rapid response team. This publication meets the minimum standard because the timing of the pre- and post-periods and rollout are described.

DOMAIN 10. ADHERENCE / FIDELITY

Description

Adherence to the intervention

What to Consider

Consider reporting of compliance with the intervention for the duration of the study, fidelity data on intervention use, or described mechanisms that ensures compliance (e.g., provider reminder integrated in electronic health record that cannot be skipped).

Where to Look

Examine the results section and tables.

How to Rate

Minimum standard: Reports fidelity information for at least one intervention component, or describes evidence of adherence or a mechanism ensuring compliance to the intervention

Examples

- “Attachment rate of educational reminder messages was close to 100%, or was 100%, in departments in which messages were attached electronically; was 100% in departments in which messages were attached by hand; and around 40% in that in which an operator pressed a key to add the message.”
Eccles et al. 2001. Effect of audit and feedback, and reminder messages on primary care radiology referrals: a randomised trial. This publication meets the minimum standard because fidelity data is provided.
- “Moreover, of the 188 codes in the rapid response team postintervention period, 20 occurred in non-ICU patients who had documented acute physiological decline within 12 hours of the code (10.6%), but where the rapid response team was not activated (potential rapid response team underuse accounting for 16 deaths).”
Chan et al. 2008. Hospital-wide code rates and mortality before and after implementation of a rapid response team. This publication meets the minimum standard quality because fidelity data is provided.

DOMAIN 11. HEALTH OUTCOMES

Description

Patient health-related outcomes

What to Consider

Consider patient and non-professional care-giver health-related outcomes (including e.g., quality of life), but exclude satisfaction, provider-behavior (e.g., number of diagnostic tests ordered, knowledge) and process improvements.

Where to Look

Examine the results section, tables, and figures.

How to Rate

Minimum standard: Reports data on at least one health-related outcome

Examples

- “Over the 4-year period since the HQSR <Hospital Quality Service and Recognition> program was first implemented in 2001, the average risk-adjusted complication rate declined by approximately 2 percentage points in both surgical and obstetrical categories. Weighted average risk-adjusted complication rates and the associated 95% confidence intervals are presented in Figures 2 and 3.”
Berthiaume et al. 2006. Aligning financial incentives with quality of care in the hospital setting. This publication meets the minimum standard because complication rates are reported.
- “An unexpected but significant result of the test of change was the dramatic decrease in nosocomial infections on the unit. The rates decreased gradually over the first five months and then held at zero for three months.”
Stefancyk et al. 2009. High-use supplies at the bedside. This publication meets the minimum standard because infection rates are reported.

DOMAIN 12. ORGANIZATIONAL READINESS

Description

Barriers and facilitators to readiness

What to Consider

Consider reported QI resources and culture (e.g., QI committee, leadership commitment, prior QI experience, staff attitudes, and education and decision support resources) and results of barriers and facilitator assessments.

Where to Look

Examine the introduction and discussion sections.

How to Rate

Minimum standard: Reports at least one organizational-level barrier or facilitator

Examples

- “In February 2000 an Asthma forum was held in South Eastern Sydney Area Health Service (SESAHS). This forum identified a lack of coordinated paediatric asthma services, and acknowledged a need for improved asthma services. An Asthma advisory group was established with representatives from St George Hospital, Sydney Children’s Hospital, Randwick, The Sutherland Hospital, community based health professionals and allied health professionals.”
Studdert et al. 2005. Introduction of standardised emergency department paediatric asthma clinical guidelines into a general metropolitan hospital. This publication meets the minimum standard because the organizational interest in the topic (an advisory group was established) was reported.
- “Inadequate knowledge and lack of resources were the most common perceived barriers.... The role of external facilitators was important to the process.”
Puoane et al. 2004. Improving the hospital management of malnourished children by participatory research. This publication meets the minimum standard because perceived barriers and facilitators were assessed.

DOMAIN 13. PENETRATION / REACH

Description

Penetration / reach of the intervention

What to Consider

Consider the number of units or sites participating in the intervention compared to the available / eligible units (e.g. the number of participating sites without knowing how many sites were initially approached / were eligible is not sufficient).

Where to Look

Examine the results and discussion sections.

How to Rate

Minimum standard: Provides information on the proportion of all eligible units who actually participated

Examples

- “Of the 94 eligible practices in the network, 24 (25%) agreed to participate in this project.”
Mold et al. 2008. Implementation of evidence-based preventive services delivery processes in primary care: an Oklahoma physicians resource/research network (OKPRN) study. This publication meets the minimum standard because the proportion of eligible practices is reported.
- “Hospital-wide code rates and mortality before and after implementation of a rapid response team.”
Chan et al. 2008. Hospital-wide code rates and mortality before and after implementation of a rapid response team. This publication meets the minimum standard because the penetration is hospital-wide.

DOMAIN 14. SUSTAINABILITY

Description

Sustainability of the intervention

What to Consider

Consider discussions of sustainability, reference to organizational resources (e.g., costs and necessary commitments) and policy changes needed to sustain the intervention after withdrawal of study personnel and research resources, evidence of enduring changes (e.g. automated electronic reminders), or an extended duration of the intervention period as evidence of sustainability.

Where to Look

Examine the discussion and limitations sections.

How to Rate

Minimum standard: Describes the sustainability or the potential for sustainability

Examples

- “We are currently developing appropriate monitoring strategies to ensure that lessons in basic clinical practices and HIV medical management are properly disseminated. This is a critical component to the sustainability of such a program, particularly as it rolls out into semi-urban and rural sites.”
Morris et al. 2009. Use of task-shifting to rapidly scale-up HIV treatment services: experiences from Lusaka, Zambia. This publication meets the minimum standard because the sustainability potential is described; the minimum standard for study quality is not met because evidence of sustainability is not provided.
- “Over the 4-year period since the HQSR <Hospital Quality Service and Recognition> program was first implemented in 2001, the average risk-adjusted complication rate declined by approximately 2 percentage points in both surgical and obstetrical categories.”
Berthiaume et al. 2006. Aligning financial incentives with quality of care in the hospital setting. This publication meets the minimum standard because evidence of sustainability is provided (4-year program).

DOMAIN 15. SPREAD

Description

Ability to be spread or replicated

What to Consider

Consider evidence of spread or failure to spread and large rollouts; available resources such as a toolkits, how-to manuals, protocols, or booklets that describe the intervention in detail and could facilitate spread and replication; or discussions of spread potential.

Where to Look

Examine the discussion and limitations sections.

How to Rate

Minimum standard: Describes the potential for spread, existing tools for spread, or spread attempts / large-scale rollout

Examples

- “The lack of correlation of improvements with baseline practice characteristics might suggest that the multicomponent intervention can be effective across a range of practices and clinicians.”
Mold et al. 2008. Implementation of evidence-based preventive services delivery processes in primary care: an Oklahoma physicians resource/research network (OKPRN) study. This publication meets the minimum standard because the potential for spread is described.
- “Following the experience in these two hospitals, the process has been scaled-up within the province and staff at a further 23 hospitals have been trained.... They use a detailed training guide [14].”
Puoane et al. 2004. Improving the hospital management of malnourished children by participatory research. This publication meets the minimum standard because spread and successful scale-up to 23 hospitals are described.

DOMAIN 16. LIMITATIONS

Description

Interpretation of the evaluation

What to Consider

Consider whether the interpretation of the reported findings in the abstract / summary and/or the discussion section takes the study design (e.g., the lack of a comparator) or other evaluation limitations into account; refers to the presented data (not future research / developments or intervention limitations)

Where to Look

Examine the discussion and limitations sections.

How to Rate

Minimum standard: Reports at least one limitation of the design / evaluation

Examples

- “There are several limitations of this that may confound our findings. A number of other pain initiatives... were in place during this time frame, so that their relative contribution to the changes in pain prevalence and satisfaction cannot be determined.... Second, one of the measures used to establish efficacy of the PRN <Pain Resource Nurse> program relies on patients’ memories of whether a doctor or nurse asked them about their pain.”
Paice et al. 2006. Creating organizational change through the pain resource nurse program. This publication meets the minimum standard because limitations of the study design and measurement are reported.
- “There are 4 major important limitations of the present report. First, there was no comparison group, and it is not possible to be certain that the improvements noted among the 66 practices were due to the study interventions and not merely to secular changes occurring for other reasons.”
Ornstein et al. 2009. Improving diabetes care through a multicomponent quality improvement model in a practice-based research network. This publication meets the minimum standard because limitations of the evaluation are reported.