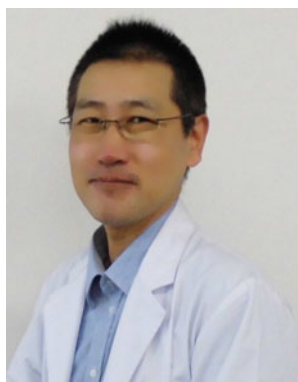


Use of quality of recovery score (QoR40) in the assessment of postoperative recovery and evaluation of enhanced recovery after surgery protocols

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Quality of recovery and its relationship with quality of perioperative care

Surgery has become less invasive with technological advances in surgical instruments and imaging. In addition, safer anesthesia has been achieved with the use of airway management tools including the video laryngoscope and supraglottic airway device, perioperative assessment by

transesophageal echocardiography during noncardiac and cardiac surgery, and new anesthetic agents and muscle relaxants such as remifentanyl and rocuronium bromide. Nowadays, there is an emphasis on the quality of postoperative recovery [1]. Quality of recovery, an important postoperative outcome, is classified into two categories [2]: doctor-reported outcome (DRO) and patient-reported outcome (PRO). DRO includes survival, adverse events, and length of hospital stay; PRO includes quality of life (QoL), quality of recovery, and patient satisfaction. The Food and Drug Administration defines PRO as “any report on the status of a patient’s health condition that comes directly from the patient, without interpretation of the patient’s response by a clinician or anyone else” [2]. Litwin et al. [3] showed that physician ratings of patient symptoms do not correlate well with patient self-assessment of health-related QoL, suggesting that both DRO and PRO are important.

Donabedian’s classical model of quality of care consists of three components: structure, process, and outcomes [4]. The Donabedian model is applicable to perioperative medicine (Fig. 1). Monitoring and evaluation of both DRO and PRO are essential for improving quality of care.

What is the QoR-40?

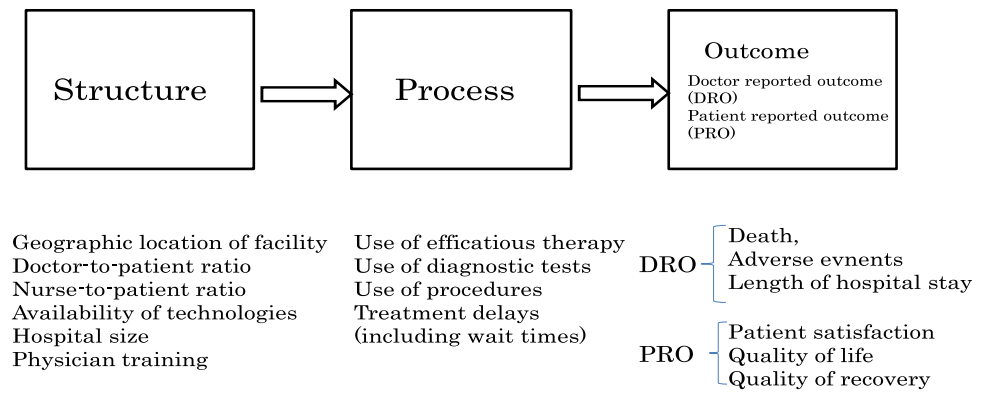
The quality of recovery score (QoR-40) is a recovery-specific and patient-rated questionnaire that contains 40 items and comprises five subscales relating to comfort, emotion, patient support, physical independence, and pain. QoR-40 was developed and validated in Australia [5]: it is an assessment of PRO including QoL. The 40 questions were extracted from a list of 61 items related to recovery from anesthesia and surgery. These items had been identified as important by patients or their relatives or friends,

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Fig. 1 The Donabedian model for evaluating quality of care. Donabedian’s classical model of quality of care has three essential components: structure, process, and outcomes



anesthesiologists or experienced trainees, nursing staff working in recovery or postoperative wards, and surgeons or experienced trainees [2]. The total score and subscales of the QoR-40 are measured using a 5-point Likert scale and individual scores are then summed. The minimum score is 40 points and the maximum score is 200 points. The initial study showed that the correlation between postoperative QoR-40 and visual analogue scale was good ($r = 0.68, P < 0.001$) and that a negative correlation between QoR-40 and duration of hospital stay was observed ($\rho = -0.24, P < 0.001$). Also, reliability was good, as demonstrated by test–retest reliability (intraclass $r = 0.92, P < 0.001$), Chronbach’s $\alpha = 0.91$, and split-half coefficient ($r = 0.83, P < 0.001$). The completion time was less than 6.7 (SD 4.2) min. These psychometric results showed that the QoR-40 has good validity, reliability, and feasibility in perioperative settings [5].

The Japanese version of QoR-40 has been tested for its validity, reliability, and feasibility in clinical settings in Japan. The Japanese version of QoR-40 was validated according to standard methods of cultural adaptation and psychometric analysis [6] (Fig. 2). It is recognized that the use of measures such as the QoR-40 across cultures requires accurate translation of the items and cultural adaptation of the instrument to maintain the content validity at a conceptual level across different cultures [7]. There are seven steps to this cultural adaptation process. The first stage is forward translation. At least two forward translations of the instrument should be made, thereby allowing comparison of the two translations. This step may reveal discrepancies in the translation process and highlights unclear wording in the original document. The second stage is synthesis. The two translators and a recording observer together synthesize the results of the translations. The third stage is back translation. Two translators who were not involved in the forward translation then translate the synthesized questionnaire back into the original language. This is a process of validation that ensures that the forward-translated version accurately reflects the original document. The fourth stage is a check by an expert

committee. In this stage, the methodologist, health professionals, language professionals, and translators (forward and back translators) review all the translations and reach a consensus on any discrepancies between the translated and original versions. The fifth stage is the pretest. The pre-final version of the new questionnaire is tested on subjects or patients in the target setting. Ideally, 30–40 people should be tested. Stage six is submission and appraisal. This step involves a full assessment of the score-level attributes including construct validity, reliability, and responsiveness (Fig. 3) [7]. In the QoR-40J, one item of physical independence was changed to another item because the original item could not be understood by Japanese patients. QoR-40J has good validity, reliability, and feasibility in the Japanese clinical setting.

Clinical studies have been conducted using the QoR-40 including selection of anesthesia methods, effects on QoL, interventions for enhancing postoperative quality of recovery, and detection of factors that lead to poor recovery. In a study on new anesthetic methods for cardiac surgery, Lena et al. concluded the fast-track anesthesia combined with morphine-clonidine spinal analgesia controlled postoperative pain better and resulted in better quality of recovery than conventional analgesia [8]. Myles et al. examined the relationship between quality of recovery and postoperative QoL using QoR-40 and the Short Form 36 Health Survey (SF-36), which is the de facto standard of measurement of QoL. It was found that QoR-40 was a better measurement of early postoperative recovery, and that early postoperative poor recovery was predictive of poor QoL at 3 months after surgery. This information may allow implementation of earlier and more effective support strategies (e.g., counseling, home assistance) for hospitalized patients to achieve better QoL [9]. Murphy et al. [10] conducted a randomized controlled trial to examine the effect of preoperative dexamethasone on postoperative quality of recovery of patients undergoing outpatient laparoscopic cholecystectomy surgery. They concluded that the use of preoperative dexamethasone enhanced post-discharge quality of recovery and reduced

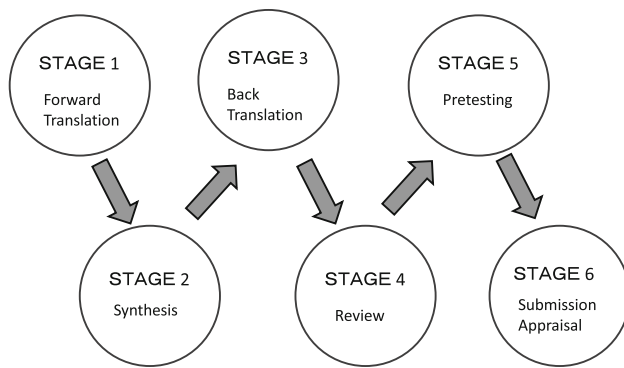


Fig. 3 Process of cross-cultural adaptation

discharge by postoperative day 7 was appropriate from the perspectives of both doctors and patients.

Conclusion

Postoperative quality of recovery measured by QoR-40 is an assessment of PRO. The QoR-40J was useful for assessing the perioperative outcomes after adaptation of ERAS protocols in Japan, encompassing both DRO and PRO.

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