

Association for Surgical Education

Validation of a novel intraoperative assessment tool: The Surgical Procedure Feedback Rubric



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KEYWORDS:

Workplace-based assessment;
Surgical education;
Direct observation;
Validity;
Intraoperative assessment;
Rubric

Abstract

BACKGROUND: The Surgical Procedure Feedback Rubric (SPR) is a tool to document resident intraoperative performance and provide targeted feedback to support learning in a competency-based model of surgical education. It differs from other assessment tools because it defines performance criteria by increasing complexity through the use of behavioral anchors, thus embedding standards of performance within the tool. This study explores aspects of validity of the SPR as an assessment tool.

METHODS: A 14-month observational study was conducted in 2 surgical training programs. Factor structure of the SPR was examined using exploratory factor analysis. Discriminative ability of the SPR was examined using analysis of variance.

RESULTS: The SPR measures 3 factors: Operating Room Preparation, Technical skill, and intrinsic Competencies. Analysis of variance demonstrated the utility of the SPR to discriminate between intraoperative performances of residents by postgraduate training year.

CONCLUSIONS: This study contributes to the validity argument for the SPR by providing evidence for construct and discriminative validity.

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Postgraduate medical education is shifting from the traditional time-based model of training to a competency-based model.¹ This transition has resulted in changes in the way medical educators think about assessment.^{2,3} Proponents of competency-based medical education have highlighted a need to move away from assessments of

learning (summative assessment) that predominated traditional models of medical education in favor of assessments for learning (formative assessment). The latter focuses on providing trainees with constructive feedback to support their learning. In addition, there has been increasing emphasis on the need for assessments to be based on the direct observation of residents' performance in the clinical environment through the use of workplace-based assessments (WBAs). For surgical specialties, this means the assessment of residents' clinical decision-making, problem solving, and procedural skills should occur in the operating room (OR) as an immediate point-of-contact assessment.

This research was supported by the Social Sciences and Humanities Research Council of Canada and the Postgraduate Medical Education Office at Queen's University.

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Manuscript received May 12, 2015; revised manuscript July 25, 2015

Although a number of procedural assessment tools exist in the literature (eg, Global Operative Assessment of Laparoscopic Skills, Global Rating Index for Technical Skills, Operative Performance Rating System, Direct Observation of Procedural Skills, Ottawa Surgical Competency Operating Room Score, and the Zwisch Scale), well-validated intraoperative assessment tools are less common.⁴⁻⁸ Even well-studied intraoperative assessment tools such as the Global Rating Scale and Procedure-Based Assessments lack substantial validity evidence.⁵ Furthermore, most intraoperative assessment tools use checklists and/or numerical rating scales that limit their usefulness as assessment tools and reduce their ability to support feedback. Although checklists are simple and easy to use, feedback is limited to what was or was not done. They do not provide information about the quality aspects of performance. Nor do they provide learners with information on how to improve performance in subsequent interactions. In the case of numerical rating scales or Likert scales, standards are implicit, resulting in ambiguity for assessors, significant variability in assessment results across assessors, and bias.^{9,10} In addition, variability in assessor scores makes interpretation of results generated with these tools difficult for programs when making judgments about a residents' progress and limits the usefulness of feedback to learners.¹¹ As suggested by Driessen and Scheele,¹¹ rubric-based assessment tools may overcome these limitations.

Rubrics differ from rating scales through the use of descriptors that make standards of performance explicit. Advantages include (1) shared frames of reference for assessors through the use of a clear assessment framework and scoring guide; (2) improvement in the consistency, reliability, and efficiency of scoring for both single and multiple assessors; (3) providing trainees with immediate feedback on performance; and (4) improvement in trainees' ability to self-assess performance.^{12,13} In the nursing literature, rubrics have been shown to assist faculty in providing individualized feedback efficiently, within the time constraints of the busy clinical workplace.¹⁴⁻¹⁶ The use of rubrics in medical education has been limited primarily to the assessment of written and oral work done by medical trainees in formal teaching environments.¹⁷⁻¹⁹ The development of 3 surgical rubrics in ophthalmology have been described in the literature; however, their use in the clinical setting has yet to be reported.^{20,21}

We have developed a novel intraoperative assessment tool using a rubric-based design called the Surgical Procedure Feedback Rubric (SPR). The SPR was designed to assess intraoperative performance of surgical residents during a single operative encounter. It was developed for use across a variety of procedures. It differs from other assessment tools because it defines performance criteria by increasing complexity through the use of behavioral anchors, thus embedding standards of performance within the tool. The purpose of the SPR is 2-fold: (1) to assess and document residents' clinical performances in the OR for the

purpose of monitoring resident performance over the course of their training and (2) to provide residents with consistent, timely, and quality feedback on their intraoperative performance. This article focuses on the first purpose by examining the effectiveness of the SPR as a tool to assess and document resident intraoperative performance. This is accomplished by examining the factor structure of the SPR and determining if the SPR can distinguish between the intraoperative performances of different levels of learners.

Methods

Surgical Procedure Feedback Rubric Development and Description

The SPR was developed by a working group consisting of a faculty surgeon (Sara Jones), an assessment specialist (Laura McEwen), and a surgical resident (Ayca Toprak). The SPR was designed to assess a surgical resident's intraoperative performance during a "single" operative encounter, which was defined as a single operation from the time the patient entered the OR to the time they left. In developing the SPR, each operative encounter was broken down into different stages. For each stage, the working group identified foci of assessment then described observable behaviors (behavioral anchors) that defined 3 levels of performance for each focus of assessment: needs attention, developing, and achieving. Throughout the development process, expert reviews were conducted with the residency program director and faculty members, and their feedback was incorporated. The expert review process functioned not only to provide evidence for content and construct validity but also to facilitate buy-in by surgical faculty for the project. The SPR was piloted in the division of general surgery between January 2012 and June 2012 to determine its acceptability and feasibility (Fig. 1). The SPR was well received by both faculty and residents. Data collected during the pilot informed further revisions to the SPR.

This iterative process resulted in 14 performance attributes organized within 7 foci of assessment (Appendix 1). The foci of assessment correspond to the CanMEDS roles of Medical Expert (preoperative probe, surgical reasoning, surgical technique, and postoperative plan), Communicator,

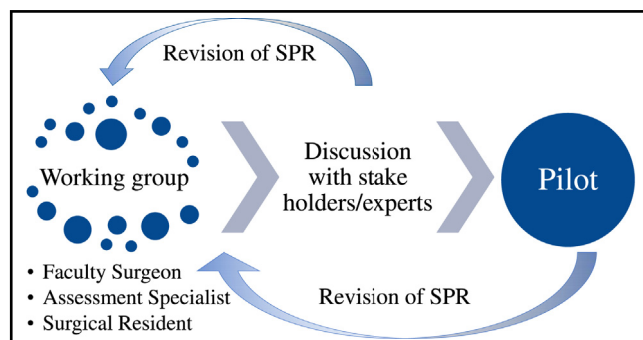


Figure 1 Development process for the SPR.

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