Verification of Proficiency: A Prerequisite for Clinical Experience

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KEYWORDS

• Surgical skills training • Surgery • Proficiency

For more than a century, residents received their technical training exclusively in the operating room, and performed procedures based on patient availability without attention to individual learner needs. More recently, several factors have led to the introduction of dedicated skills laboratories and a more widespread belief in the value of time spent in skills training.[1–8] The impetus for change in our approach to teaching technical skills has been driven by a reduction in resident work hours, concerns about patient safety, and the challenge of achieving technical proficiency with emerging technology. The educational rationale for skills training in a laboratory setting is based on established theories of learning in which the trainee passes through cognitive, integrative, and autonomous stages of learning.[9] Deliberate practice is one of the fundamental elements proven to encourage automaticity and improve motor-skill abilities. Deliberative practice requires that the learners repeatedly perform well-defined, level-appropriate tasks, and receive immediate feedback that allows for correction of errors.[9–12] Therefore, the earlier stages of teaching technical skills should take place outside the operating room to permit deliberative practice and allow the trainee to focus on more complex patient care and management issues in the clinical situation. In past models of surgical training that were based primarily on apprenticeship, these opportunities for deliberate practice were rare.

EVALUATION OF SKILLS TRAINING

Evaluation is essential to document learner performance and proficiency, provide learner feedback, and gather data for performance standards. It is therefore an important component of skills instruction. In their 2005 paper, Williams and colleagues[13] identified six major factors that compromise the process of observing, measuring,

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and characterizing a resident performance. In order of importance, these factors are: (1) incomplete sampling of performance, (2) rater memory constraints or distortion, (3) hidden performance deficits of the resident, (4) lack of meaningful benchmarks, (5) faculty members' hesitancy to act on negative performance information, and (6) systematic rater error. The investigators offered practical solutions to overcome these problems and these are summarized in **Table 1**. These principles should guide all forms of performance assessment including the implementation of skills evaluation.

Researchers have developed several validated instruments for evaluating the technical aspects of surgical performance.[1,14–23] One such example is the Objective Structured Assessment of Technical Skills (OSATS).[19,20] The OSATS is a performance-based examination designed to assess the technical-skill competence of surgical trainees in which candidates perform a series of standardized surgical tasks under the direct observation of an expert.[17,19,20] Examiners score candidates using a task-specific checklist consisting of 10 to 30 essential elements of the procedure and a global rating form. This form includes five to eight surgical behaviors, such as respect for tissues, economy of motion, and appropriate use of assistants. An export of this evaluation to nine programs in the Chicago and Los Angeles areas demonstrated psychometric properties that are highly consistent with previously reported data suggesting that the examination is portable.[24] In one of the most comprehensive skills lab curriculum evaluations reported to date, Anastakis and colleagues[25] used the OSATS and trainee evaluations to conduct a formative evaluation of the Surgical Skills Centre Curriculum at the University of Toronto. Historical controls were compared with resident participants and results indicated that single session training on a procedure would not yield a lasting effect on a resident's performance, a finding that is supported in the expertise and motor learning literature.[25] Anastakis and colleagues emphasized the need for ongoing repetitive practice.

Table 1
Factors that compromise the process of measuring resident performance and suggested solutions

Problem	Solution
Inadequate sampling	Maximize number of ratings and sample broadly Observe all aspects of a performance
Memory distortion	Evaluate and give immediate feedback, Encourage immediate recording Limit number of items
Hidden performance deficits caused by collective nature of work	Performance examinations Observe a wide range of activities
Lack of meaningful benchmarks	Resist changing the form to follow trends Develop rating norms Carry out longitudinal analysis
Hesitancy to act	Seek performance reports only Do not ask faculty to assign grade or make promotion recommendation Make progress decisions by committee
Systematic rater error	Increase number of raters Familiarize raters with evaluation form

Data from Williams R, Dunnington G, Klamen D, et al. Forecasting residents' performance – partly cloudy. Acad Med 2005;80(5):415–22.