A HUMAN FACTORS PERSPECTIVE ON SIMULATION-BASED SURGICAL SKILL ASSESSMENT

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Background
International reports on surgical safety revealed major deficiencies in worldwide surgical skill training. Training is moving towards objective, outcome-based performance assessment and simulation is increasingly used for that goal. At the University of Twente’s Experimental Centre for Technical Medicine, we revised our Surgical Skills course to further improve surgical skill assessment.

Goal
The aim is valid and reliable simulation-based assessment of surgical skill based on a human factors approach for performance assessment.

Method
1. Characterize skill and optimal performance
2. Develop performance objectives
3. Determine goal of assessment (formative/summative)
4. Select 3-5 assessors
   a. Identify and define performance objectives
   b. Validate objectives: discriminate between experience levels
4.5a. Establish construct validity of simulator parameters: use parameters that discriminate between experience levels
4.5b. Use parameters that reflect performance objectives, not just those that are easy to measure
4.6c. Test assessors on required level of agreement
4.6d. Ensure independence of assessors by blinding them to identity and level of training of trainee
5. Establish reliability: Internal consistency > .80 Test-retest reliability > .80
6. Provide feedback to trainees; evaluate assessment process and outcomes and adapt procedure if necessary

Evaluation
1. Assessed skills: scrubbing, suturing, local anesthesia, incision/excision. Students are allowed to make minor errors if corrected during the assessment
2. Training = observation, feedback, and practice

Conclusions
Adherence to the assessment guidelines proved to be a challenge. Sufficient time and resources for assessor training is paramount to reliable assessment. Also, adequate design of simulation-based assessment should take psychometric principles concerning reliability into account.

Discussion
Reliable and valid performance-based assessment requires adequate assessor training. Procedural proficiency has to be demonstrated before practice on patients.