Contemporary Bronchoscopy Training and Assessment: A la recherche du professionnalisme perdu?

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The goal of medical training is to produce practitioners who demonstrate the mastery and professionalism (skills, knowledge, attitudes and behavior) required for the successful delivery of medical therapy [1].

Since the Hippocratic era, all clinical, cognitive and attitudinal skills have been acquired in the master-apprentice training model: experienced mentors gradually train younger apprentices and introduce them to medical practice. The concept of residency, outlined by A. Flexner and W.S. Halsted in the early 20th century and still used by most Western hospitals today, has essentially followed the same principles [2]: a stepwise postgraduate training working with patients serves as part of the teaching syllabus in the hospital. The assumption is that learning curves are climbed by performing a minimum number of procedures. When competency-oriented, low-stakes assessment is not a feature, then written examinations and the completion of a minimum number of procedures provide 'objective' criteria on which to base competency [3].

However, today the relevance of this methodology comes into question due to the complexity of modern medical procedures, the reduced length of stay in hospital for all diseases and the emphasis on outpatient and minimally invasive therapies. It is also increasingly evident that the mastery of procedural skills can be accelerated by focusing on a training model that is based on competency instead of one based on a fixed number of years, and that neither patients nor their novice physicians should be subjected to the potentially unethical practice of 'learning by

doing' especially early on in the course of training [1, 3]. In fact, competence training is largely facilitated by simulation devices which allow trainees to develop basic skills before treating and without harming patients [2, 4, 5]. Since their introduction in the late 1990s, bronchoscopy simulators have revolutionized not only procedural training but also the evaluation of bronchoscopy skills.

Although all major scientific associations advocate objective measures to assess competent practice [6], few such instruments have been developed or validated to measure competency in knowledge or technical skills in the field of bronchoscopy. In a preliminary study implementing a virtual-reality bronchoscopy model and a written assessment test, no relation was found between bronchoscopy skills and theoretical knowledge, nor could competency be assumed based on the length of the bronchoscopy training or on an arbitrary number of procedures performed [7]. Davoudi et al. [8] appropriately validated two instruments to assess technical bronchoscopic skills, showing significant differences in the level of skills between novices and fellows or attending physicians. A cognitive test consisting of multiple-choice questions was also validated for its content and implemented by the same group. No correlation could be found between attained scores and the number of bronchoscopies performed or self-declared expertise [9].

In this issue of *Respiration*, Konge et al. [10] raise the important need for establishing defensible pass/fail-scores for two assessment tools of bronchoscopic skills.

They compared experienced endoscopists, trainees with varying experience and complete novice medical students on a virtual-reality bronchoscopy simulator, setting standards and exploring how these standards relate to experience, i.e. whether a certain number of performed procedures do indeed guarantee basic competence in bronchoscopy.

Using the contrasting-groups method, they found a passing score that would discriminate medical students with no bronchoscopy experience from experienced bronchoscopists. This cutoff point would have been passed by all physicians having performed >75 bronchoscopies but unfortunately would not be able to discriminate between trainees and experts, or, in other words, between competent and incompetent endoscopists. The Angoff method was also implemented to assess clinical bronchoscopic skills. A panel of experts determined the hypothetical performance of a virtual 'borderline' examinee (defined as one who might just pass the assessment on some days but on other days would fail) and set random passing scores for each item above his performance. All physicians who had performed >80 bronchoscopies passed the scores, although the authors acknowledge that this assessment tool did not measure more advanced procedures, e.g. performing biopsies.

The finding that having had previous experience of 75–80 bronchoscopies is related to performance above the pass level of a medical student or a hypothetical 'borderline trainee' is of course reassuring. However, it does blur the main message that procedural training and assessment should ideally be both simulation- and compe-

tence-oriented and not merely assumed by a fixed number of procedures having been performed.

A relevant assessment tool should also distinguish between physician groups of adjacent knowledge or experience and not only between the extremes 'complete novice' and 'expert'. Furthermore, the similarity of the results in the two assessment tools examined in this study does not necessarily imply validity in the true meaning of the term [11].

Instead of merely counting the number of bronchoscopies a fellow has performed we also have to consider the quality of knowledge and the integrity of training to which he has had access. 'Repetitio' is not necessarily 'studiorum mater' if basic knowledge is lacking or erroneous principles have been taught. In a recent multicenter study, the learning curve of novices was shown to be greatly enhanced by the introduction of a concrete educational intervention [12]. Similarly, a greater gain in learning, in terms of both cognitive knowledge and technical skill, was demonstrated during a 1-day introductory bronchoscopy course in another recent study [13]. The well-recognized diversity in the quality of bronchoscopic performance and training throughout the international medical community warrants a more homogeneous delivery of training [14].

As new procedural training dogma is being developed and structured curricula are being implemented, modern objective assessment tools may soon become particularly important in certifying competence in the field of endoscopy. A more demanding, complex, individualized, but realistic model is developing. It is the dawn of a more professional era in medical education.

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