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DOI:

[10.1089/end.2017.0859](https://doi.org/10.1089/end.2017.0859)

Document Version

Peer reviewed version

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Citation for published version (APA):

Raison, N., & Dasgupta, P. (2018). Editorial Comment on: Competency-Based Training and Simulation: Making a "Valid" Argument by Noureldin et al. *Journal of Endourology*, 32(2), 94-95.

<https://doi.org/10.1089/end.2017.0859>

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Editorial Comment on “Competency Based Training and Simulation – Making A “Valid” Argument”

Often and understandably, discussions on taxonomy trigger little general interest and are confined to the outer reaches academic interest. However, the paper by Noureldin et al on the framework for the validation of educational and assessment tool raises critical concerns relevant to both surgeons and physicians in general, irrespective of whether they have a particular interest in medical education¹.

Simulation-based training is increasingly being used in medicine and has facilitated the adoption of competency based medical education². Like all aspects of medicine, this evolution in training from traditional experiential based systems has only come about through extensive research into simulation training³. Surgical simulation is certainly not new; Indian doctors used clay models for training in 600BC and the stories of body snatchers supplying the medical schools and hospitals in the 18th century are well known. Yet the formal recognition of simulation training as being on par with if not superior to the established time-based training initially faced considerable opposition. Medical educationalists had to rigorously prove the effects of simulation training on technical skill acquisition before such programmes were officially endorsed and amalgamated into training³. Yet as described in this review, whilst the work of researchers around the world can only be commended, their techniques and methodologies perhaps need to be modernised. For the last 60 years the American Psychological Association (APA) and American Educational Research Associations (AERA) have offered cross-speciality standards for development and implementation of tests or simulators. Somewhat embarrassingly, the common tests of validation still used almost uniformly in the urological literature originate from the 1974 guidance issued by the APA/AERA. Individual tests of validity such as face, content and construct, still widely applied to simulation tool validation in the surgical literature, were largely abandoned by the 1999 APA/AERA consensus standards. Educational theory instead recognised that validity should be considered a hypothesis to be refuted or supported through the accumulation of evidence. Like any hypothesis, validity can never be absolutely proven and remains specific to the context and use of the simulation tool in question. In contrast to such a unified concept, analysis of individual components may offer little benefit in isolation.

As the field of medical education continues to develop, the methodological errors seen in a lot of the literature is likely to gain further significance. Over the last few decades undergraduate, postgraduate and licensing bodies have focussed on providing reliable and accurate assessment of competence. Simulation has played an increasingly important role in providing such professional assessment^{4,5}. It allows the targeted assessment of specific topics and skills in safe and controlled conditions. But vigorous validation is critical and something that has often been lacking to date⁶. Results from simulation based assessments must be trustworthy and valid to the specific application and context. The effectiveness of simulation tools rests on their ability to act as a surrogate for educational or clinical outcomes so that results can be extrapolated to the real world⁷. In addition, educators must be able to select tools based on both educational and practical requirements to provide assessment that is feasible, applicable, cost effective and efficient. As a result, it is very important that tools are analysed and validated correctly.

It could be argued that the worst outcomes of poor validation of simulation tools is less effective training than expected. In contrast, the use of simulation tools in assessment has far more worrying implications. We hope that this review offers as a wake-up call for researchers and clinicians alike. Whilst the potential for the simulation tools as training and assessment remains undiminished, great care needs to be taken when evaluating current evidence and looking to the future, researchers must ensure studies are carefully validated. The authors of this important paper offer a “unifying terminology” for validation of simulators¹. The ultimate test for surgeons would be to ensure that these simulation tools “do exactly what they say they do on the tin” – enhance patient safety.

Author Disclosure Statement: Prof P Dasgupta and Mr N Raison confirm that no competing financial interests exist.

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