Editorial

Present and Future of Neurosurgery Training and Education

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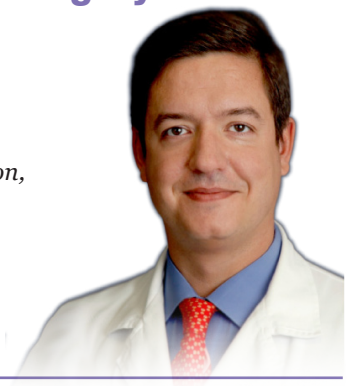

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Abstract

Multiple challenges are faced by educators and trainees. These challenges are multidimensional and pertain to a scenario in which trainees have to become in a short period of time competent technical neurosurgeons, while at the same time conscious of economic and professional factors that will influence their practice. It is the duty of societies and leading educators to come together in developing continental methods of training aimed towards "organised learning". The goal should strictly be the education of our residents, not just the utilisation of their manpower for a number of years.

Keywords: *certification, competency, education, neurosurgery, training*

Introduction

The advent of new technologies is making our specialty far more complex than it was a century ago. Clearly, the apprenticeship model of training and educating new generations cannot be further applied in a narrow sense. In the first decade of this century we looked at the variability on neurosurgery certification across the world (1–5). Among the conclusions found in this series of manuscripts, it was noted that although successful certification processes exist worldwide, the variability in such process is pronounced, both within and across continents. This was further reaffirmed by other authors (6–8).

Training Methodology and Subspecialty Correlation

Neurosurgery training could be defined as the period during which a trainee will be exposed to all technical and cognitive aspects of both surgical and non-surgical treatments of neurological disease, focusing in the most prevalent and relevant aspects of brain, spine, and peripheral nerve pathology and becoming competent in the unsupervised practice of such techniques. However, in practical terms there are two challenges with this concept.

The first challenge is to fit all the subspecialties in the specific time that a society considers needed, which varies between 5 and over 10 years depending on the country and the second challenge is how to verify that competency indeed has occurred. We have to take into consideration that our field is now expanding at an exponential rate. The advances made in specialties that consider minimal access (endoscope, interventional neuroradiology, minimally invasive spine, and functional neurosurgery) make it virtually impossible to make someone competent in all of them.

Therefore, the idea of establishing a shorter "core training" of three years followed by a dedicated two to three year specialisation in one or two areas becomes not only appealing, but probably necessary. It is naive to think that all neurosurgeons have to be competent in all areas of our field. This goal, at the present time, is probably not realistic, even more so, in a society where good outcomes are demanded of us. For instance, while learning the basics of proximal and distal control or microsugical anastomotic techniques is probably part of that above referenced "core training", being able or willing to include aneurysm surgery in our routine daily practice may not be practical due to limitations of our environment, hospital support, or training. The only caveat to this is that it will require a maturity on the part of the trainee to declare him/herself devoted to a restricted practice from early on in their training. Potential solutions to

this should they change their minds later on are additional fellowships. Credentialed postgraduate subspecialty training therefore becomes more important than ever, since we will be publicly claiming that those graduates can practice in such subspecialty in a competent and unsupervised fashion.

Certification of Competency

Most countries test neurosurgery trainees with cognitive examinations during residency, and rely on internal evaluations of technical competency during training. Additionally, some countries expand their examination into the postgraduate period by means of implementing oral examinations in which cases are typically presented but it remains a cognitive test, not a technical one. Measuring the complexity of the certification systems, the organisation of the leading boards and the components of the examination processes, in the World Federation of Neurosurgical (WFNS) study series we identified leading certification systems within their specific continent (1–5). In Asia, the processes offered by Malaysia and Republic of Korea were highest, followed by the Hong Kong/Singapore joint examination system (5). The intention of such ranking system was to take a snapshot of the complexity and diversity of items utilised in the different countries. The correlation between overall quality and ranking score was not done, nor implied in this study series, so caution should be taken in the interpretation of such results. Equally, it became apparent that there was an existing lack of homogeneity across the world in the way neurosurgeons are tested and become certified. Cognitive competency evaluation by means of online assessment can become a simple method of sharing a similar evaluation system across the world (9,10). Currently, this is limited to maintenance of certification in the United States but this could be utilised worldwide as a method of assessment. A databank of questions could be created under the scope of the WFNS, with ability to distribute online protected cognitive evaluations across the world. The examinations should be designed with capability to discriminate levels of competency ranging from unsatisfactory, early learner, competent, proficient, and expert, equivalent to the physician diagnostic inventory scale. The idea of a worldwide certification system under the scope of the WFNS is both intriguing and appealing, and it could easily open barriers to competent neurosurgeons in this era of globalisation.

The Future Role of Simulation in Training

Recently, neurosurgery has been able to develop adjuvants for learning that are starting to appear in our academic institutions with the intention to decrease the steep learning curve towards competency level (11–13). Simulators, under the scope of an organised curriculum system (11) offer a practical solution to individual adjuvant training in areas of weakness, new technologies and have a future role in pre-operative rehearsal to decrease real errors in surgery. Similarly to pilots, neurosurgery trainees in the future will probably have a logbook of simulated emergencies and case modules. If countries utilise comparable simulators and evaluation methods, this could provide a solution to the current challenge of evaluating "technical competency". Limitations on cost and implementation under individual hospitals are still major challenges. It will be therefore important to produce science that proves how this technology indeed delivers what it promises i.e. shorter learning curve, less errors, better outcomes, higher competency levels of trainees.

Socio-economic and Ethical Aspects of Professional Education

In this era of restricted funding, limited resources and accountability of individual expenses to achieve our surgical goals we must not forget our obligation to teach residents awareness regarding cost containment and proper resource utilisation without compromising the care of our patients. In addition, we must also not forget the boundary that should exist between industry collaboration and neurosurgeons, since this area can easily blur our capability to distinguish when our field is being advanced rather than just the interests of a few. We should teach our residents to treat their patients as family members. If they would do different surgeries to a patient than they would to a family member, can we say that we succeeded in our goal to educate them as physician surgeons?

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