

Guest editorial

Future orthopedic training, a global watch

Increased quality of life by combatting pain and restriction of movement is the obvious aim when treating the orthopedic patient. Global challenges may vary, but they harness the necessity of collaboration in order to maintain the high standard of orthopedic care that patients deserve. This was discussed and presented by a task group at the Beijing Summit of the 2012 Chinese Orthopaedic Association Congress and World Orthopaedic Alliance. Medical knowledge, professionalism, and non-technical as well as technical skills must be secured in orthopedic training. Technical skills include both visuospatial and psychomotor abilities apart from working memory. Advanced visualization and simulation tools with metrics on performance are new educational methods that will strengthen these abilities.

Global challenges and systems under pressure

The scene varies from easy access to orthopedic surgeons to shortage of them. In India, for example, there are less than 30,000 orthopedic surgeons catering for a population of 1.2 billion—i.e. 1 orthopaedic surgeon per 400,000 people. There is an acute need to increase the number of trained orthopedic surgeons and also to continuously upgrade the skills.

Further education and training may come under pressure because of financial interests, problematic links to industry, and conflicts with insurances. Conflicts with one's own practice may also exist due to different owners with varying financial models, and deficits in education and skills training.

Generation Y

Training the future orthopedic surgeon means training people born in generation Y, i.e. between 1982 and 2005. Generation Y is technology savvy and multitasking. Having grown up in the information age, they require new teaching strategies since they are used to large amounts of easily searchable and easily available information. Generation Y prefers flexibility and autonomy, which might create tensions with senior staff educated and trained in a different era. A lecture given no longer means a lecture learned. The vast and diverse amount of information available can result in information overflow. A balance between providing a large amount of information and filtering resources will therefore be essential.

Working-hour directives

To improve patient safety and the quality of life of doctors, working-hour regulations have been implemented in many parts of the world during the last decade. Patients should not be treated by exhausted doctors, just as airline passengers do

not fly with exhausted crews (Helmreich and Meritt 2001). Doctors' time spent in hospital has therefore been reduced, and some unintentional consequences include lack of continuity and lack of exposure to rare pathology. There are conflicting results regarding the effect of working-hour regulation on patient safety; both increased and reduced mortality have been reported.

"The elephant in the room"

The role of industry concerning education and skill training is debatable. Industry has a very limited role in education of basic trainees. However, training that involves new products and devices cannot be satisfactorily achieved without input from and co-operation with industry. Undue influence from industry may lead to corrupt practice. Globally, the public is increasingly aware of the connection between surgeons and industry. The risk of creating mistrust between the patient and the surgeon must be avoided; transparency is vital.

The aggressive nature of industry, driven by the obligation to return value to shareholders, is risky if academic medical centers neglect their responsibility for continuing education of medical practitioners. An imbalanced system must be avoided, and we should be aware of unintended consequences of well-intentioned reforms. The "elephant in the room" is a metaphor for the effect of reimbursement where doctors and hospitals are rewarded for using expensive technology. This policy has resulted in a system that is good at transferring knowledge about new expensive technologies, while excluding simpler and more cost-effective procedures.

Skills academies

Continuous education, training, and assessment is the key to achieving excellent long-term clinical results. So far, there has been much focus on technical skills training. However, there is an increasing awareness of non-technical skills such as situation awareness, decision making, communication skills, teamwork, and leadership skills (crew resource management, CRM) (Flin et al. 2006, Moorthy et al. 2006, Meurling et al. 2013). It is high time for a transition from the apprentice model to outcome-based education where knowledge, skills, and attitudes are triangulated. The national or regional bodies have an important role in initiating and coordinating skills academies and also in defining minimal standards. This will enable comprehensive training engaging experienced faculty and state-of-the-art education methods (Figure 1a and b), hands-on workshops, visualization, simulated surgery procedures, and systematic teamwork training. This need for state-



Figure 1a. The state-of-the-art British wooden mechanical horse simulator during World War I. Photo: public domain.



Figure 1b. State-of-the-art training, 2013: full-scale simulation (crew resource management, CRM) in the operating room with an authentic team (surgeon, scrub nurse, anesthetist, and nurse). Both technical skills and non-technical skills are trained systematically. Photo: Lisbet Meurling.

of-the-art training is paramount in all countries, including the developing world.

The way forward

Process optimization should aim at standardizing protocols and checklists (Arriaga et al. 2013) and also educating patients. Evidence-based medicine should guide clinical practice and data collection. The Open Access movement means free and immediate electronic access to an increasing number of scientific journals (for example, Acta Orthopaedica), especially important in the developing world with a shortage of libraries. Audits should be carried out periodically in order to optimize clinical outcomes. Apart from technical skills, communication skills, correct attitudes towards patients, and the ability to understand indications are paramount. Also, an ethical framework for conduct of surgery is mandatory.

International collaboration is the only way forward when improving the global standards of training in orthopedic surgery. By using a systematic approach, the future will be bright.

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