

# EndoVascular resuscitation and Trauma Management Specialists in Training – The Future of EVTMM Education

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Residency and fellowship programs for surgical training have been around for close to 150 years; however, over the past 2–3 decades the individual surgical experience of the residents and fellows has changed dramatically [1–3]. Technological advances and their application in medical and surgical fields have been highly beneficial for patient outcomes, but they pose a significant challenge when educating future surgeons in trauma. New imaging technology has improved diagnosis and allowed for non-operative management of trauma patients who previously would have required an exploratory laparotomy. Artificial intelligence and computer vision has allowed for automated diagnostic imaging analysis. Advances in minimally invasive surgery and robotic surgery and an increase in procedures performed percutaneously has resulted in less exposure to elective open surgery, with those remaining cases often being conditions requiring expertise and experience [4]. In addition to this, regulations regarding working hours have reduced overall on-duty time, marginalizing evening and over-night hours where independence is gained. This not only results in direct limitation of surgical experience but also forces clinics to expand their employment of resident physicians, furthermore increasing competition for theatre time [5]. With the modern day surgical trainees already suffering from both reduced working and operating hours, healthcare and surgical education leaders need to respond to this

rapidly changing landscape. If hands-on operative training is lacking, there needs to be an equally rapid advancement in modern ways of teaching surgery. Traditional surgical education can partly be provided through enhancement of existing educational tools not reliant on the physical patient. Considerable time needs to be spent in laboratories and workshops, like the EVTMM workshop [6], to learn and master new skills, and advanced technological surgical training modules should be used, such as surgical simulators, including virtual and augmented reality. This will, however, bear with it financial implications and require administrative resources that surgical institutions need to be aware of and take into account. Training surgeons in this modern way comes with a huge cost. Recourses need to be acquired to meet these expenses and perhaps the medical industry who are fueling this medical revolution should partly take financial responsibility in training future surgeons. In addition, the use of pre-recorded videos of surgical procedures available online can be used as a complementary educational tool. For example, the EVTMM academy website can serve this purpose where trainees can use these to go through an operation or part of a procedure, without the same stresses that exist in a live operating environment [7]. Another aspect is that this technological advancement will progress at different speeds in different parts of the world. Therefore, promoting international collaboration and exchange of surgical trainees in order to broaden their exposure can be beneficial for everyone. This form of fellowship program not only exposes the surgical trainees to diverse health care systems around the world, but also permits those from developing countries to get acquainted with expensive high-tech systems and those from developed countries to benefit from a higher volume of traditional surgical training.

In addition to practical training, theoretical training can and needs to adapt as well. One of the few benefits

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Figure 1 The EVTm-ST logo.

of the recent Covid-19 pandemic has been the expansion of online video communication. This has opened the door for improved international theoretical collaboration, and courses are now not limited to physical attendance. The EVTm-ST (EndoVascular resuscitation and Trauma Management – Specialists in Training) regular international case discussions that take place every month are one example of multidisciplinary theoretical collaboration where the trainees take it upon themselves to educate each other and share experiences from their own institutions (Figure 1). This not only improves trainees' surgical knowledge, but also helps promote communication, teamwork, and leadership, which are skills that will only become more important to master.

Surgeons will in the future find themselves having to lead larger, more multidisciplinary teams including both medical and non-medical staff, and their ability to communicate will be crucial.

Finally, it is an exciting time to be training in surgery. New technology will allow the treatment of patients that were never able to be treated before and will require structural changes in both the way we work and the way we train. The gender imbalance that still exists within the profession will also hopefully improve as training and working patterns become more flexible, allowing surgery to remain an attractive specialty, even for those who seek a work–life balance rather than the traditional surgical career.

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