

Thoracic surgery training in Europe—the perspective of a trainee

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Abstract: Duration and content of Thoracic surgery training differs considerably across Europe, leading to unequal levels of knowledge, skills and attitudes at the time of graduation as a specialist. The European Board of Thoracic Surgery examination strives to overcome these regional differences by offering a diploma to achieve harmonization and equal qualified certification. The HERMES initiative, driven by a joint task force from European Society of Thoracic Surgeons (ESTS) and European Respiratory Society (ERS) is currently establishing a consensual syllabus and curriculum for Thoracic Surgery to standardize content of training and achieve equal levels of qualification all-over Europe. In this context, new opportunities in teaching and learning have become available and should be considered to support and encourage for beneficial development in the future. International platforms are the key for connecting with experts and other trainees and are provided by annual meetings and within the ESTS School.

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Harmonized Europe?

The definition of training is the development of learning and the acquirement of knowledge, skills and professional attitudes, which altogether will determine competence. Methods for gaining those abilities include teaching and research. According to this general definition William Stewart Halsted founded a graduate training program for surgeons more than 100 years ago. His educational process was based on knowledge of the basic sciences, research and graduated patient responsibility for the resident (1). Halsted's principals of surgical training were (2):

- ❖ The resident must have intense and repetitive opportunities to take care of surgical patients under the supervision of a skilled surgical teacher;
- ❖ The resident must acquire an understanding of the scientific basis of the surgical disease;
- ❖ The resident must acquire skills in patient management and technical operations of increasing complexity with graded enhanced responsibility and

independence.

Those education principles are still accepted and valid, although a harmonized training is challenging.

In Europe, Thoracic Surgery is increasingly considered an independent specialty. This autonomy is at the same time leading to a challenging practice of thoracic surgery.

Across Europe, thoracic surgical training is offered in various hospitals and centers including university hospitals and non-academic hospitals. Patient population and exposures are diverse in rural, suburban, and urban locations.

Some nations of the European Union (EU) had established thoracic surgery as its own unit focused on chest diseases (3). In many European countries it is possible to achieve a diploma nevertheless not in Belgium and Luxembourg.

Within Europe, thoracic surgery training varies between thoracic surgery, cardiothoracic surgery, vascular or general and thoracic surgery training.

In some training programs esophageal surgery is in the

program included in other centers it is part of the general abdominal surgery.

The development of minimally invasive and robotics surgery had advanced and became popular. Lung transplantation and using ECMO system are not standardized content of thoracic surgery training in a unit.

One of the most challenging problems in Europe is to uniform a training and certification in Thoracic Surgery.

Klepetko and co-authors published in 2001 a European guidance for general thoracic surgery. The document, which has been revised in 2014, gives an overview of suggested requirements and organization of general thoracic surgery, which should guide national governments and regional bodies (4,5).

National professional organizations established in 1958 the European Union of Medical Specialists (UEMS) as a representative organization, to represent every specialty. Currently 37 countries are participating with more than 1.6 million specialists in 50 specialties. In 1984 the first European diploma for a medical specialty was created to standardize quality across Europe; however, UEMS accredited diplomas are so far without legal value in most European countries, although they represent a quality label on top of the National specialty diploma or certificate of completion of specialist training (CCST). The aim at medium or long term is to replace National specialist diplomas by the UEMS specialty Board certifications.

A survey on thoracic surgery, commissioned by the UEMS, was performed in 25 European countries to illustrate the differences across European thoracic surgery training. The data showed that the length and content of training, number of procedures to be performed as 1st surgeon and number of training centers per million inhabitants distinguished dramatically (6). In 2015 McElnay and Massard published a survey on thoracic training across Europe (7).

In these survey 48 trainees from 21 countries participated. The survey showed differences in length of thoracic surgery training, in working time, in quality of training and exposure to academic skills.

The UEMS—European Board of Thoracic and Cardiovascular Surgeons (EBTCS) were established 2004 by the section of cardiothoracic surgery, which was subdivided into two divisions for thoracic and cardiac surgery respectively. In 2013, thoracic surgery was individualized as an independent section, and its first action was to create a specific board of thoracic surgery (EBTS).

EBTS organizes a yearly examination for thoracic surgery.

The examination consists of 4 sections (30 minutes each): pre-examination interview, discussion of a paper, clinical case discussion and an oral examination. The purpose it is to certify that the successful applicant has acquired a level of knowledge, skills and attitudes that is compatible for an independent practice; this qualification should favor European mobility of specialists (8).

While European Board examinations are well organized, there is still a gap to fill in terms of prerequisites. So far there is no consensual definition of content and intensity of training, i.e., syllabus and training curriculum. The European Respiratory Society (ERS) took the initiative to launch the HERMES initiative (Harmonized Education in Respiratory Medicine for European Specialists), which led to the first European syllabus for training in pulmonary medicine defined by a consensus between European specialists (9). Specialists from different European countries are working together to obtain consensus on a syllabus, and subsequently a description of curriculum. The draft of curriculum includes listing of learning resources, and suggests tools for evaluation of learning outcomes. The ESTS got an opportunity to launch a joint task force on thoracic surgery in 2014 together with ERS; publication of the syllabus is pending, and the task force group is currently progressing on the design of curriculum.

Training opportunities

Halpenny *et al.* defined the training of a surgeon and called the making process education and said Surgeons—are made not born (10).

The foundation of training is education and research.

But where and how shall a trainee start his surgical training? The intimate wish of each trainee to spend as much time as possible in the operating theater to acquire technical skills is challenged by regulations and evolving treatment modalities.

The working hour regulations are problematic, because they limit the amount of time available or learn the spectrum of diseases that are treated surgically and the development of new therapies (11). For instance, dissemination of VATS lobectomy required that teachers learn first, bypassing the trainees on the easiest cases! The number of procedures required for a senior to be competent is difficult to appraise by simple assumption; in a recently published study, the senior surgeon became competent after 30 procedures, but efficient after 90 only (12).

The development of new approaches to surgical training

and evaluation of its outcomes to increase the efficiency of the learning process are established. In complement to clinical training with practice on patients, thoracic surgery residents are offered opportunities to gain the surgical skills with virtual reality simulators, inanimate skills training stations, and animate models. E-learning modules and webinars allow increasing theoretical knowledge. Those tools became a new chance to learn about surgical management, techniques, and potential complications (13). The impact of robotics on surgical training is enormous.

However, an increasing number of surgery residents are pursuing fellowship training across Europe and outside of Europe. A fellowship in another institution is highly recommended to see different special skills and alternative ways of patient management. In Europe fellowship programs are rare, probably due to difficulties obtaining funding and the languages barrier. Mobility during training is mandatory for those motivated by an academic career.

The European Society of Thoracic Surgery (ESTS) is particularly implicated in educational issues. ESTS was founded in 1993 at the 1st European Conference on General Thoracic Surgery, where Ingolf Vogt-Moykopf was elected as first president; the embryo of the Society counted eleven members. In the subsequent 24 years, ESTS has considerably grown to become the world largest society for general thoracic surgery.

Currently the annual meeting of ESTS presents as a recognized international conference attracting experts from all over the world. First initiatives were to offer a traveling fellowship and the itinerant courses.

ESTS School gradually increased its educational offer, which is now divided into 3 learning tracks: knowledge, skills and academic competence. In each track, a couple of educational events are organized annually (see ESTS website www.ests.net), which address both trainees and consultants. Since 5 years now, there is an annual cycle with 3 yearly events for continuous medical education in Russia. In order to respond to contemporary challenges, ESTS has organized a course on management of tuberculosis in partnership with WHO, and is planning a course on terrorism and catastrophe management. Besides high standard of education, these courses are a unique social opportunity for networking between colleagues and between generations.

All educational events are accredited by UEMS accreditation council for continuous medical education, and may be integrated into the now compulsory life-long learning process (14). The HERMES syllabus is a precious

guide for the content of such learning programs seen from above.

ESTS established a trainee symposium at its annual meeting in 2014 in Copenhagen; the tremendous success led to repeat this symposium at each meeting, and to increase the time slot to 90 minutes. During the symposium, trainees and consultants debate and discuss relevant concerns facing thoracic surgical trainees, including clinical situations, education and research. The exchange between trainees coming from different countries, discussing and comparing their training modalities and clinical experience is an important platform for social networking. The first international collaboration of trainees was founded to work together on a survey.

The most challenging part during the training period is probably to add formal research training to otherwise intense surgical clinical training. ESTS has taken concern of this problematic as well. The ESTS Biology Club is a scholarship program allowing young scientists and clinicians to visit a Host Unit in a European country with the aim to learn a research technique, which is not available in their Home Unit.

In the 21th century a new tool of learning appeared: E-learning. Virtual learning, life-surgery in the lab and the ESTS YouTube channel has become new features in professional education. E-learning provides a fast and easy way to connect with international experts and exchange experiences. ESTS is planning educational webinars to be launched in 2017.

Training challenges and solutions suggested by trainees

The implementation of working hour limitations in Europe opposes to acquire adequate surgical skills by limitation the duration of exposure in the operating theatre, and by limitation the time available for research during the official working time.

During the shrinking working time, not everything is achievable at the same level, and it will become increasingly difficult to find a balance between research and surgical training will be more and more difficult.

The training program should include a feedback for critical evaluation of the resident's skills and also in-training examination and qualifying and certifying examinations, as part of progressive surgical education should be a standardized process. Time for learning is decreasing, and consequently efficiency of teaching must be optimized to

achieve reasonable outcomes. A training for trainers should be implemented and considered to offer a standardized education and training in thoracic surgery across Europe.

Regularly participation in tumor board and morbidity-mortality meetings should be part of the training program and also Journal Clubs with the presentation and guided discussion of recent publications in thoracic surgery.

Offer of fellowship and exchange programs in the EU with funding could emerge international exchange of experience and should be considered by different units. Support by European organizations, such as ESTS with its network of national regents, might help trainees to find available positions according to language abilities. Further support and encouragement are necessary to build an international program of surgical and scientific exchange.

Another challenging issue to become a thoracic surgeon is to deal with administrative aspects such as reimbursements and the diagnosis related group (DRG) system in a hospital. A DRG system controls costs and promotes quality in a hospital as a method of reimbursement or as a product line management tool. The evaluation of surgical performance became very difficult and the need of additional tools to evaluate is necessary.

To quantify volume and numbers of cases is not an indicator of a qualified surgical performance (15). However, in the context of mobility and European examinations, we should think of a standardized European logbook for trainees, which take in account not only the number of procedures performed, but also achievements in a scientific training curriculum, conferences and courses attended, publications and presentations, and other.

The implementation of databases is a confirmed way to improve and control quality. Compulsory participation in a national database has led to a laudable decrease of perioperative mortality in France (16). Quality control may be easily obtained by comparison to national or European mean outcome parameters. Big data are also an important material for registry studies in areas where it may be difficult to set up prospective randomized studies. Every national database should be implemented in the ESTS database to create a European-wide database for developing guidelines (17).

Conclusions

Overall, thoracic surgical education is characterized by rapid and dynamic changes in knowledge, understanding of surgical disease, new types of procedures, and evolving

technologies.

Harmonization of thoracic surgery training across Europe is essential to ascertain even quality of patient care, facilitate mobility of specialists, and improve an international exchange of expertise.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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