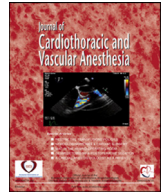




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Special Article

Perspectives on the Fellowship Training in Cardiac, Thoracic, and Vascular Anesthesia and Critical Care in Europe From Program Directors and Educational Leads Around Europe

Mohamed R. El Tahan, MD^{*}, Mendoza Vasquez LE, MD, MSc[†],
 Alston RP, MD, FRCA, FFPMRCA, FFICM[‡],
 Gabor Erdoes, MD, PhD[§], Jan U. Schreiber, MD, PhD^{||},
 Jens Fassl, MD, PhD[¶],
 Kirstin Wilkinson, BMedSci, MB, BS, FRCA[#],
 Flo Forner A, MD^{**}, Vera von Dossow, MD^{††},
 Donna Greenhalgh, MBChB, FRCA, FFICM^{‡‡},
 Marie-Jo Plamondon, MDCM^{§§}, Nigro Neto C, MD, PhD^{|||},
 Gianluca Paternoster, MD^{¶¶}, Giovanni Landoni, MD, Prof^{†††},
 Collaborators, Joachim M. Erb, MD^{###}, Fabio Guarracino, MD^{****},
 Chirojit Mukherjee, MD, PhD, FASE, MBA^{†††},
 Peter Rosseel, MD^{†††},
 Simon Howell, MA (Cantab), MRCP, FRCA, MSc, MD^{§§§},
 Joerg Ender, MD^{||||}, Bodil S. Rasmussen, MD^{¶¶¶},
 Arafat Heba, MD^{####}, Theofani Antoniou, MD, PhD^{*****}

^{*}Anaesthesiology Department, College of Medicine, Imam Abdulrahman Bin Faisal University, Al Khubar, Saudi Arabia

[†]Department of Anesthesia and Intensive Care, IRCCS San Raffaele Scientific Institute and Vita-Salute San Raffaele University, Milan, Italy

[‡]Department of Anesthesia, Critical Care and Pain Medicine, Royal Infirmary of Edinburgh, United Kingdom

[§]Department of Anaesthesiology and Pain Medicine, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland

^{||}Department of Anesthesia, Maastricht University Medical Center, The Netherlands

[¶]Institute of Cardiac Anesthesiology, Heart Center of the Technical University, Dresden, Germany

[#]University Hospital Southampton NHS Trust, Southampton, United Kingdom

^{**}Department of Anesthesia and Intensive Care, Heart Center Leipzig, Leipzig, Germany

^{††}Institute of Anesthesiology Heart and Diabetes Center NRW, University Hospital of Ruhr-University, Bochum Bad Oeynhausen, Germany

^{‡‡}Wythenshawe Hospital, Manchester Foundation Trust, Manchester, United Kingdom

^{§§}Department of Anesthesiology and Pain Medicine, University of Ottawa, Ottawa, Ontario, Canada

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[†]Address reprint requests to Giovanni Landoni, MD, Department of Anesthesia and Intensive Care, IRCCS San Raffaele Scientific Institute and Vita-Salute San Raffaele University, via Olgettina 60, Milan 20132, Italy.

E-mail address: landoni.giovanni@hsr.it (G. Landoni).

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- ^{|||}Department of Surgery and Anesthesia, Dante Pazzanese Institute of Cardiology, São Paulo, Brazil
- ^{¶¶}Anesthesia and Intensive Care, San Carlo Hospital, Potenza, Italy
- ^{##}Department of Anaesthesiology, Prehospital Emergency Medicine and Pain Therapy, University Hospital Basel, Basel, Switzerland
- ^{***}Unit of Cardiothoracic and Vascular Anesthesia and Intensive Care, Department of Anesthesia and Critical Care Medicine, Pisa University Hospital, Pisa, Italy
- ^{†††}Department of Anesthesia & Intensive Care HELIOS clinic Heartcenter Karlsruhe, Karlsruhe, Baden-Württemberg, Germany
- ^{‡‡‡}Department of Anesthesia, Amphia Hospital, Breda, The Netherlands
- ^{§§§}Leeds Institute of Medical Research at St. James's University of Leeds, Leeds, United Kingdom
- ^{||||}Department of Anesthesia, Leipzig University, Leipzig, Germany
- ^{¶¶¶}Department of Anesthesia and Intensive Care, Clinical Institute, Aalborg University Hospital, Denmark
- ^{###}University Hospital Southampton, United Kingdom
- ^{****}Onassis Cardiac Surgery Center, Athens, Greece

This article reviews fellowship training in adult cardiac, thoracic, and vascular anesthesia and critical care from the perspective of European program initiators and educational leaders in these subspecialties together with current training fellows. Currently, the European Association of Cardiothoracic Anaesthesiology (EACTA) network has 20 certified fellowship positions each year in 10 hosting centers within 7 European countries, with 2 positions outside Europe (São Paulo, Brazil). Since 2009, 42 fellows have completed the fellowship training. The aim of this article is to provide an overview of the rationale, requirements, and contributions of the fellows, in the context of the developmental progression of the EACTA fellowship in adult cardiac, thoracic, and vascular anesthesia and critical care from inception to present. A summary of the program structure, accreditation of host centers, requirements to join the program, teaching and assessment tools, certification, and training requirements in transesophageal electrocardiography is outlined. In addition, a description of the current state of EACTA fellowships across Europe, and a perspective for future steps and challenges to the educational program, is provided.

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Key Words: cardiothoracic anaesthesiology; program director; fellowship structure; postgraduate education; Europe fellowship; anesthesia; intensive care; cardiac anesthesia

THIS SPECIAL article reports perspectives from the contributing educational centers, program directors, and currently training fellows about the fellowship program at the European Association of Cardiothoracic Anaesthesiology (EACTA) accredited host centers.

The European Board of Anaesthesiology recently published its requirements for training in anaesthesiology.¹ The requirements' goals include ensuring high-quality training, safe anaesthesiology services to all European citizens, facilitation of the free movement of anaesthesiologists within Europe, and participation in and representation on other bodies and organizations that deliver health care in Europe. The minimum duration of training is 5 years, of which at least 1 year is to be spent training in intensive care medicine. The European Society of Anaesthesiology has established the nonmandatory European Diploma in Anaesthesiology and Intensive Care that is a multilingual, end-of-training, 2-part examination covering all the relevant basic sciences and clinical areas applicable to a specialist in anaesthesiology. However, no consensus currently exists within Europe as to the definition, and minimum basic and advanced training required, to become an anaesthesiologist specialized in cardiac, thoracic, and vascular anesthesia (CTVA).

The EACTA, as the European leader in education and scientific research in CTVA and critical care medicine, and in perfusion, organ transplantation, and mechanical circulatory support, recognized the need for the provision of high-quality training in CTVA and intensive care medicine. In 2009, the EACTA established the Fellowship Training Program in CTVA and critical care. Until

2017, it had limited uptake when the EACTA decided to expand the program to a number of European centers.

This review highlights the history, important advances, current regulations, teaching and assessment tools, and future challenges of the EACTA Fellowship Programme from the authors' perspectives.

Historical Notes

For many years, the idea of a European training program was considered too complex to be achievable. There was an early initiative to form a consensus between the EACTA and the European Society of Anaesthesiology (ESA) as presented in the draft of the agreed consensus written by Feneck et al.² Subsequently, there were several initiatives from senior EACTA educational leads, including Peter Rosseel, Peter Alston, Simon Howell, Patrick Wouters, and others, to reach an updated consensus between the EACTA and the ESA regarding the contents of the Fellowship Programme curriculum in CTVA. Once the development of the curriculum for CTVA started in December 2017, there were contributions from 32 EACTA officers, including the educational and EACTA leads from the education committee and from the 8 EACTA subspecialty committees, which were the foundation blocks of the governance structure of the EACTA.

As might have been expected, there were a number of hurdles to overcome to arrive at the present structure of the Fellowship Programme. For example, there was no standardized duration for fellowship training among the earliest 3 accredited

hosting centers (from 6 to 24 months). In Germany, several heart centers had an insufficient volume of cases in thoracic and vascular anesthesia to meet the certification requirements. Centers in Spain, France, and Eastern European countries were unable to offer a 2-year period of fellowship. Several fellows were unable to afford either the scientific leave or personal expenses for a 2-year fellowship. Both the thoracic and vascular subspecialty committees opposed the plan to drop thoracic or vascular anesthesia from basic training. Fortunately, all of these hurdles now have been overcome. The EACTA's curriculum has its own learning objectives, goals, duration, types, and design. Relevant competencies, learning, and teaching methods are described carefully.

The approval of the EACTA Fellowship had significant benefits for the specialty of cardiothoracic and vascular anesthesiology, for departments of anesthesiology, for cardiothoracic and vascular surgery services, and for patients. The approval and implementation of this educational infrastructure contributed further to the development of a collective interest in cardiothoracic and vascular anesthesiology and benefited the anesthesiology residents, faculty members, medical students, and health care systems.

Host Centers of the EACTA Network

In 2009, the first center in Europe to be accredited by the EACTA was the Leipzig Heart Center (Leipzig, Germany), an initiative taken by Chirojit Mukherjee and Jörg Ender, in liaising with the EACTA board of directors at that time. The first non-European center to be accredited in 2018 was the Dante Pazzanese Institute of Cardiology (Sao Paulo, Brazil), reflecting EACTA's vision to extend its leadership role beyond the European Union (EU). The most recent centers to gain accreditation were Maastricht (The Netherlands), Bad Oeynhausen



Fig 1. New logo of EACTA Fellowship Programme (cardiac, thoracic, and vascular anesthesia and critical care). Every host center accredited by EACTA is identified by this logo. EACTA, European Association of Cardiothoracic Anaesthesiology. Permission was given by EACTA board of directors.

(Germany), Dresden (Germany), and Montpellier (France). The EACTA's seal of quality is used by the accredited centers (Fig 1). Of note, the Society of Cardiovascular Anesthesiologists US Fellowship Programs currently include 69 Accreditation Council for Graduate Medical Education–accredited programs.³

In July 2017, the EACTA education committee collected a database of all graduated fellows of the host centers since the beginning of the program. Currently, there are only 42 graduated fellows from 6 EACTA host centers (Fig 2). Most graduates are men (71%), which raises concerns that the subspecialties (or the fellowships) are less attractive to women. The low numbers of graduates from the EACTA Fellowship Program could be explained by the few fellowship positions initially available at the 4 initial host centers during the first 8-year period from 2009 until 2017 (Supplemental Fig 2). Most European cardiothoracic anesthesiologists did not have any additional formal training postresidency. European residents have anesthesia subspecialty training, and many of them can direct their interests to the specific area they want to focus on when they become staff anesthesiologists.

Notably, with the exception of graduates from Switzerland, Greece, and The Netherlands, most (74%) graduate fellows

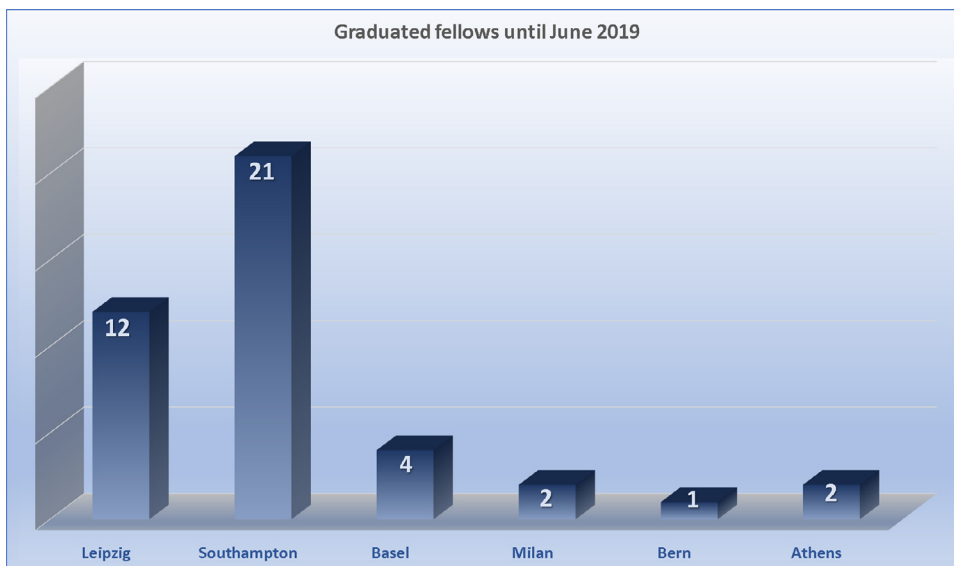


Fig 2. Geographic distribution of the graduated EACTA Fellowship Programme fellows until June 2019. Total of 42 graduates distributed as Leipzig (Germany), 12 since 2009; Southampton (UK), 21 since 2009; Basel (Switzerland), 4 since 2011; Milan (Italy), 2 since 2015; Bern (Switzerland), 1 since 2017; and Athens (Greece), 2 since 2018. EACTA, European Association of Cardiothoracic Anaesthesiology. Permission was given by EACTA board of directors.

from the different EACTA host centers came from abroad (Table 1). Most non-native fellows came from countries outside Europe. Interestingly, Greece has not had any foreign candidate, probably because of the need to master the Greek language at an advanced level. The details of the fellows at these 11 centers are presented in Table 1. Currently, the EACTA network has 10 active, accredited centers in 7 European countries and 1 outside Europe (Supplemental Fig 1, A, B, and C) and offers a maximum of 20 fellow positions every year.

The centers applying for accreditation or reaccreditation as host centers must meet the minimum requirements⁴ (Supplemental Table 2). The department heads of the host centers must approve the program, and a minimum of 10% of the working time of the program director and of at least 2 other faculty members must be dedicated to the responsibilities of the EACTA Fellowship Programme. Not fewer than 1 faculty member must be certified in transesophageal echocardiography (TEE) (eg, European Association of Cardiovascular Imaging (EACVI)-EACTA joint accreditation, Association of Cardiothoracic Anaesthesia and Critical Care, or National Board of Echocardiography). The centers applying for accreditation must have an emergency room that is available 24/7, an intensive care unit for cardiothoracic and vascular patients, and an incorporated or an additional postanesthesia care unit.

Requirements to Join the EACTA Fellowship Programme

The EACTA Fellowship Programme is open for both European and non-European citizens. The applicant must be a board-licensed anesthesiologist as testified by either a European or non-European certificate of training in anesthesia and pass at least a B2 language level (or equivalent) as determined by the host center. Licensing to practice medicine in the host country is mandatory to join the program. In some centers, the local governmental authorities may determine the level of language proficiency required to obtain a professional license and a work permit. Fellows come in with different profiles; some are coming after graduating from residency training programs and others have been in practice for a few years. Each center has its own application form and fellowship description. The local program director and faculty usually will hold phone or video interviews with the applicants. Both the fellow and the host center must sign an official agreement or a contract prior to the beginning of the fellowship.⁵ European working hour directives have to be respected according to the prevailing national law, and the training should be a continuous period without interruption. Notably, relatively few applicants are appointed as Fellows because the standards of the selection criteria are high.

Financial Support for Fellows

The financial support of the EACTA Fellowship must be regulated by an individual agreement between the host center and the fellow. The EACTA host centers are divided into 2 categories (Table 2)⁶: those offering a salary paid monthly and those that are unable to offer a salary, where the candidates are supported by an educational grant or scholarship or are

Table 1
Fellows' Characteristics and Description of the EACTA Host Centers Updated on June 14, 2019

Host Center	Herzzentrum Leipzig, Germany	University of Southampton, UK	University of Basel, Switzerland	Vita-Salute San Raffaele University, Milan, Italy	University of Bern, Switzerland	Onassis Cardiac Surgery Center, Greece	Dante Pazzanese Institute of Cardiology, Brazil	Maastricht University Medical Centre, The Netherlands	Heart and Diabetes Center North Rhine-Westphalia, University Hospital of Ruhr-University, Bochum Bad, Germany	Heart Center of the Technical University of Dresden, Germany	Clinique du Millénaire and Clinique Clémentville, Montpellier, France
Date of EACTA Program Initiation	August 2009	February 2010	2011	January 2015	May 2017	March 2018	August 2018	October 2018	March 2019	May 2019	June 2019
Number	12*	21	4*	2	1*	2	Currently training	Currently training	Recruiting	Currently training	Recruiting
Sex, Male:Female (%)	8:4 (66.7)	15:6 (71.4)	4:0 (100)	1:1 (50)	1:0 (100)	1:1 (50)	Currently training	Currently training	Recruiting	Currently training	Recruiting
Native (%)	0:12 (0)	3:19 (15.8)	4:0 (100)	0:2 (0)	1:0 (100)	2:0 (100)	1:0 (100)	1:0 (100)	n/a	n/a	n/a
Native/Non-native, European:Non-European (%)	0:12 (0)	7:12 (58.3)	0:0 (0)	0:2 (0)	0:0 (0)	0:0 (0)	0:0 (0)	0:0 (0)	n/a	n/a	n/a

* Completion of 2-year fellowship period.
EACTA, European Association of Cardiothoracic Anesthesiologists; n/a, not available; native, fellowship undertaken in the fellow's home country; non-native, fellowship undertaken outside the fellow's own country; UK, United Kingdom.

Table 2
Fellow Positions and Financial Support of the EACTA Network, of the Host Centers' Training Periods That Are Offered, Number of Fellow Posts, and the Financial Support for Each Program, Divided Into (A) Host Centers Offering a Monthly Salary and (B) Host Centers Unable to Offer Payment

Host Center	Training Period	Fellow Positions	Financial Support
Leipzig Heart Center (Herzzentrum Leipzig) (Leipzig, Germany)	24 mo	3	A
University of Southampton (Southampton, UK)	12 mo	4	A
University of Basel (Basel, Switzerland)	24 mo	1	A
Vita-Salute San Raffaele University (Milan, Italy)	12-24 mo	3	B
University of Bern (Bern, Switzerland)	24 mo	1	A
Onassis Cardiac Surgery Center (Athens, Greece)	12 mo	2	A
Dante Pazzanese Institute of Cardiology (Sao Paulo, Brazil)	24 mo	2	A
Maastricht University Medical Center (Limburg, The Netherlands)	12 mo	1	A
Heart and Diabetes Center North Rhine-Westphalia, University Hospital of Ruhr-University Bochum (Bad Oeynhausen, Germany)	12-24 mo	1	A and B
Heart Center of the Technical University of Dresden (Dresden Germany)	12 mo	1	A and B
Clinique du Millénaire and Clinique Clémentville (Montpellier, France)	12 mo	1	A

EACTA, European Association of Cardiothoracic Anesthesiologists.

self-funded. A signed contract between the host center and trainee regarding the financial arrangement and responsibilities for both parties must be delivered to the EACTA.

Structure of the EACTA Fellowship Programme

Since implementation of the program in 2009, the EACTA Fellowship Programme has included uninterrupted training in cardiac, thoracic, and vascular anesthesia and intensive care for one or two years. This requirement only became standardized in April 2019 with the introduction of the EACTA curriculum, defining a 1-year basic obligatory training or a 2-year advanced modular training. There is no uniform start time during the year for EACTA fellowships.

In the absence of consensus among European countries on the minimum required training (duration, number of cases, or competency) in each of the subspecialties, the white paper of the EACTA Board of Directors⁴ and the consensus statement written by Feneck et al.² suggested the following requirements for the EACTA fellowship:

- 150 cardiac cases with cardiopulmonary bypass per fellow per year; 30% or more of the cases should be non-coronary artery bypass grafts
- Training in the management of patients who have mechanical circulatory support
- Training in anesthesia for procedures undertaken in the interventional and catheterization laboratory
- Basic and advanced training in TEE
- Training in cardiac surgical critical care in the intensive care unit, for a minimum of 1 month of basic training and 3 to 6 months of advanced modular training
- Training in extracorporeal perfusion technology of 1 week
- Training in thoracic anesthesia
- Training in suprainguinal vascular anesthesia
- Training in interventional vascular (thoracic endovascular aneurysm repair, endovascular aneurysm repair) anesthesia and neuromonitoring

More specifics on the duration of training, number of minimum cases, knowledge, and skills required during the fellowship training are detailed in the developed curriculum of the EACTA CTVA Fellowship.

Teaching and Learning Methods

Following the recommendations of the European Union of Medical Specialists, the CTVA Fellowship Programme is structured to provide fellows with an opportunity to develop their perioperative clinical, managerial, performance, teaching, and research skills.¹

In addition to clinical teaching during the predefined fellowship rotations, the EACTA encourages fellows to become involved in research projects. Participation in lectures, conferences, workshops, journal clubs, and seminars also is required. Every center has an organized teaching structure for fellows ranging from ward round discussions to didactic classroom lessons given by the tutors in charge.

Assessment of Fellows

The program directors at all host centers must provide 6-month updates to the EACTA educational chair, including the number, details about, and evaluations of the present and immediate past fellows for the year, which helps the EACTA with future planning and structure of the program.

The program directors evaluate fellows every 6 months on all of the following items: (1) basic and advanced knowledge; (2) clinical skills including history taking, physical examination, clinical judgment, decision making, technical and consultation skills, performances in emergency, appropriate utilization of investigations, reporting, and documentation; (3) quality of work; (4) attitude toward work; (5) judgment; (6) dependability; (7) ability to learn; (8) interpersonal relationships; and (9) academic contribution through teaching, research, publications, and presentations. The fellow will be informed about the areas of strengths or weaknesses. Additionally, the fellows must keep a record of all their clinical and

educational activities in a portfolio or logbook. The logbook is submitted to the fellowship director and to the EACTA education chair, and then uploaded together with fellow assessment to a secured EACTA storage drive.

Assessment of the Program

The EACTA aims to improve the quality of the fellowship program by addressing any complaints or weaknesses raised by trainees during the completion of training. In addition, as of September 2018, accreditation of host centers is limited to periods of 4 years. The first-ever site visit by EACTA representatives to a center outside of Europe was at the Dante Pazzanese Institute of Cardiology (São Paulo, Brazil) and was undertaken by Joerg Ender (Leipzig, Germany) and Donna Greenhalgh (Manchester, UK) in August 2018. Since then, site visits have been undertaken routinely in all accredited centers and are mandatory for all new applying host centers. The EACTA is monitoring the fellowship training programs through fellows and program assessments, completed feedback forms from graduated fellows, and reaccreditation of hosting centers every 4 years with a required site visit in case fellows' evaluations and feedback reports collected are not satisfactory.

A site visit to a center is undertaken over 1 day and consists of an assessment of the institutional organizational structure and staffing as well as the training program.⁴ An inspection is performed by 2 EACTA officers and when possible, 1 of them will be from the host center's country to minimize the financial costs, which are paid by the applicant center. The site visitors provide a constructive debriefing of their inspection to the program director and submit a final report to the EACTA education chair. For reaccreditation, the evaluation and feedback reports from fellows will be reviewed. There are regular opportunities for fellows to provide confidential written evaluations of the faculty and program as well as the fellowship training goals and objectives to the EACTA education chair.

Feedback From Fellows

At the end of the training program, the fellow will complete a questionnaire consisting of 17 questions on a 5-point Likert scale from strongly disagree to strongly agree (Supplemental Table 1). Feedback from fellows has been collected since September 2017. Reminders for feedback are sent up to a maximum of 5 times. The feedback is confidential and in compliance with the General Data Protection Regulation Addendum (<https://eugdpr.org/>). The program directors at the EACTA host centers receive anonymous feedback regarding the strengths and weaknesses of the host center to facilitate improvements in the quality of the program.

EACVI/EACTA Certification in TEE

In the 1980s, the EACTA and the European Association of Echocardiography incorporated into the EACVI. From there, they started to design a certification process for perioperative TEE. The joint process of certification in TEE was

accomplished in 2005. The first examination was held during the EACTA Annual Congress in Montpellier, France on June 4, 2005. From the perspective of the EACTA, the key points of the process were cooperation and equivalence between cardiologists and cardiac anesthesiologists. This was recognized to such an extent that the certification exam now is held regularly twice a year in conjunction with the respective EACVI congress, EuroEcho-Imaging (in December), and the annual EACTA Echo Meeting (in June)⁷; both cardiologists and cardiac anesthesiologists can apply to either. All fellows are encouraged to apply for the EACVI/EACTA certification during their training.⁸

Certification also sets a European standard for competency and excellence in TEE. Certification requires assessment of reporting and theory, in addition to practical clinical ability.⁹ Reporting and theory are assessed by a multiple-choice question (MCQ) exam selecting the single best answer of 5 possible choices. The MCQ exam has 2 sections: 50 questions related to TEE cases with displayed echoes, and 75 questions addressing the theory underlying echocardiography. Before progression to the second part of certification, candidates must pass the MCQ exam. The second part of the certification is practical; fellows are required to submit a logbook of 125 clinical cases or 75 if already certified in transthoracic echocardiography.¹⁰ The cases are expected to be completed and the logbook submitted during the final period of fellowship training.

Training Opportunities in Europe

The EACTA database of fellows shows that most fellows go abroad to another country for their subspecialty training (Table 1). The transition of early career anesthesiologists across European countries in search of subspecialty training is a consequence of the EU policy of free movement of workers. This allows all citizens the right to work and live in any country within the EU, without requirement for career-equivalent exams or a visa.¹¹ Host centers with established advanced fellowship training programs acknowledge the value in providing well-designed and organized positions. Benefits for the centers arise from the interest of fellows, who are a source of motivation and productivity. For fellows, the opportunity to work and train in another country provides the varied benefits of experiencing differences in culture, work practices, and systems along with the opportunity enhance their foreign language skills. This promotes personal and professional development of fellows at an important phase in their professional development, through the exchange of knowledge, while also providing the opportunity to challenge dogma and allow for the development of new perspectives in a fresh environment. Furthermore, adapting to new surroundings and work systems with different teams is a valuable educational experience for fellows in itself.

In addition, across Europe, a range of significantly different health care systems exists, each with their own strengths and weaknesses. The exposure to the influence of a different health care system from the one in which they have trained is a secondary advantage of the fellowship program, providing a

unique opportunity for fellows to increase their leadership and management skills.¹² The structured fellowship program is also an opportunity for non-European trained anesthesiologists who are already practicing cardiac, thoracic, and vascular anesthesia to become acquainted with European health care systems, which include routine TEE. Along with standardization of care, career advancement, personal growth, and satisfaction, the EACTA Fellowship offers an opportunity for fellows to experience living abroad, in a country not only where the day-to-day culture differs, but also where the medical practices diverge and priorities may be different. Without a doubt, the fellowship should be an experience where boundaries must be crossed and preconceived ideas abandoned.

In addition to integrating themselves into another culture, to potentially overcoming the signs and symptoms of cultural shock, and to juggling the various stages of cultural awareness (Supplemental Material), fellows have to navigate a stressful, intense, and highly demanding environment while often using their second or third language. This requires an immense amount of work, patience, and dedication not only from the fellows, but also from the educators. As such, centers that agree to host foreign-trained fellows are required to be extremely open minded, tolerant, and supportive. Fellows, on the other hand, have a unique opportunity to enhance their cultural intelligence.

After overcoming any language barrier, fellows additionally will need to familiarize themselves with different anesthesia machines, medications, and equipment specific to cardiovascular anesthesia like ventricular assistance devices and finally integrate these in a different style of practice. Coming from different regions of the world, the fellows also may have different educational needs and objectives, and it is necessary for the EACTA programs to retain a certain degree of flexibility while maintaining common standards and structures.

Fellows who join the EACTA fellowships must be highly determined and willing to sustain a potentially significant financial burden in return for a high level of education in a renowned institution. One goal of the fellows is to bring back new ideas and new concepts at their home institutions. They are striving for excellence in delivery of cardiac, thoracic, and vascular anesthesia and intensive care and wish to provide a high standard of care to their patients.

The exposure to a high volume of patients and a wide range of pathologies, each demanding a specific anesthetic management, leads to a better understanding of pathophysiology, and the ability to apply this knowledge in the treatment of patients. At the end of the program, these anesthesiologists can use the knowledge that they have gained and practice the skills they have acquired on returning to their own departments. Of note, even though the fellowship can be done in one's own home country, to date, a high percentage of fellows have chosen to go to a different country (32 of 46 = 70%) (Table 1).

Is Fellowship Training a Necessity in Today's Medical World?

Fellowship training programs not only provide an interesting and valuable form of postgraduate education but also

ensure the acquisition of high levels of knowledge and expertise. The EACTA stimulates suitable centers to offer fellowship positions to an increasing number of trainees.

The program has established rules to ensure fellowship training with high standards of care across Europe and beyond. An anesthesiologist, by definition, needs to be able to adjust to rapidly evolving situations, and the EACTA Fellowship certainly enhances this ability.

Every anesthesia training program includes some training in cardiac, thoracic, and vascular anesthesia and critical care. Therefore, most anesthesiologists have at least some exposure to these subspecialties in their training.¹³ Cardiac, thoracic, and vascular anesthesiologists use advanced technologies (eg, extracorporeal membrane oxygenation, Impella, intra-aortic balloon pump) and need to maintain high levels of vigilance in the care of high-risk patients with the stress that this entails.¹⁴ Specialized training is recommended, and substantial evidence exists that fellowship training enhances career satisfaction.¹⁵

Fellowship training allows the participant to master knowledge and skills that are well beyond those developed in general anesthesia training. Being a fellow in an EACTA Fellowship Programme is more than receiving higher education and is a highly valuable experience. Also, the fellowship program provides instructors and academic teachers the opportunity to discuss and develop both the curriculum and protocols, at local national and international levels. In addition, teaching so many junior colleagues is one of the greatest rewards of fellowship training.¹⁶ However, these benefits for the trainee come at the cost of an additional period of training, potentially with the economic sacrifice of a limited income.

Nontechnical Skills: The Future of Teamwork Training in CTVA Euro-Fellowship

In the complex environment of operating rooms and critical care, in addition to technical skills and training, the EACTA aims to assure proficiency, professionalism, and quality of perioperative care delivered by cardiac, thoracic, and vascular anesthesiologists. Although, cardiac surgery and morbidity has decreased over the years, many avoidable errors resulting from failures communication and teamwork, still occur. The Institute of Medicine published "To Err Is Human" and recommended "crew resource management" with implementation of strategies such as team training programs.¹⁷ Furthermore, the aviation industry invests great effort in the education of its pilots. Special skill-based training is a unique and innovative approach that aims for 1 goal, which is to stay mentally focused and to think, act, and communicate effectively in extraordinary difficult situations.

In its 2013 scientific statement, the American Heart Association recommended team training to improve communication, leadership, and situational awareness as well as implementation following event scenarios, checklists, debriefings, and handoff protocols in cardiac operating rooms involving all team members.¹⁸ Several teamwork measures and skill tools have been developed.

The Observational Teamwork Assessment for Surgery tool is designed specifically to assess team behaviors and communication skills, cooperation, cognition, coordination, shared leadership, and shared monitoring. The connection between communication and improved team performance has been shown in cockpit crews, navy teams, as well as medical teams. Anaesthetists Non-Technical Skills was designed to assess individual non-technical skills of anesthesiologists.¹⁷

The integration of the several skill tools within the EACTA Fellowship Program is an optimal opportunity to educate and train to communicate adequately in high-stress situations and in teamwork. Incorporating the crew resource management training into the EACTA Fellowship Program would improve the communication skills of fellows.

Future Goals and Challenges

The future of the fellowship program underpins the development of cardiac, thoracic, and vascular anesthesia and critical care to maintain and improve standards in the profession, which is continually under scrutiny. A structured program allows the centers to assess the competency of fellows and to receive constructive feedback. This also helps in maintaining high standards of care at the host training centers through the evaluations made by the fellows and the EACTA Education Committee.

The value of an exam in CTVA is under debate. Although undoubtedly it would create a standard of knowledge, there are drawbacks and obstacles that need to be considered. For example, the language in which it would be conducted would have to be agreed upon. Furthermore, there are countries in Europe where there is no difference in remuneration among the different anesthetic subspecialties and a further formal examination may hinder recruitment. This is, for instance, the situation in the United Kingdom where there is already a shortage of cardiothoracic trainees. Hence, in the upcoming years, there will be several challenges to overcome. The EACTA is working to expand the fellowship program by attracting additional European and non-European centers that are highly specialized with high-volume output, to provide a high level of training in cardiac, thoracic, and vascular anesthesia and intensive care. Additionally, the future steps include acknowledgment of the EACTA Fellowship Programme by the European countries, the ESA, and the EBA. The subsequent step will be to have a partnership and an agreement with the Accreditation Council for Graduate Medical Education-accredited fellowship programs in the United States.

The EACTA Fellowship is one of the 2 formal EACTA training programs. Another important and recent initiative of the EACTA is the Exchange Training Observership Programme. This program is intended for trainees wishing to acquire knowledge, technical skills, and management of patients undergoing thoracic surgery or critically ill patients after cardiothoracic and vascular surgery.¹⁹ This program allows young colleagues to visit specialized centers for a minimum of 2 weeks. The Consorcio Hospital General Universitario de Valencia and The Hospital Clínic in Barcelona are

now active with an exchange program in thoracic anesthesia, and the Centre Hospitalier Universitaire de Montpellier, France has been accredited for the Exchange Training Program in Intensive Care.

Conclusion

Training in cardiac, thoracic, and vascular anesthesia and critical care in Europe was enhanced by the establishment of the EACTA Fellowship Programme in 2009. After a slow start, initially with 7 fellowship positions in 2 centers, in 2 countries, the fellowship program now has 20 fellowship posts every year in 7 countries. Furthermore, it has grown beyond Europe to Brazil.

There were significant hurdles to overcome in the development of the program and undoubtedly, there will be more to face in the future. However, there is an ever-increasing enthusiasm with the EACTA Network for the Fellowship Programme because of the recognition that the intrinsic educational value of the program will drive improvements in the delivery of cardiac, thoracic, and vascular anesthesia and critical care to patients in Europe and around the world.

Conflicts of interest

There are no conflicts of interest to declare.

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Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1053/j.jvca.2019.09.029.

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