Cardiology as a specialty continues to rapidly evolve, and continuous technological advancements have altered and improved the approach to both diagnosis and treatment of cardiac diseases. In response, numerous subspecialties have arisen, and advanced fellowship training has now become the de facto career path after completion of general cardiology training to gain additional knowledge and advanced skills, which are acquired only in part during general cardiology training (1). When chosen wisely and carefully planned, a fellowship can play a vital role in enhancing a trainee’s professional profile, offer focused training with intense exposure, and typically also provide opportunities for research.

In Europe, “the times they are a-changin,” with many young cardiologists now moving across the continent in search of subspecialty training. In this paper, we highlight the current status of such international subspecialty fellowships, focusing on their advantages and shortcomings, and we highlight the ongoing and increasingly important need for standardized accreditation of subspecialty fellowships across Europe.

**INTERNATIONAL SUBSPECIALTY FELLOWSHIP PROGRAMS**

International subspecialty fellowship programs are typically designed to last 2 years, following general cardiology training. During this period, the trainee must develop the required knowledge, professionalism, and specific practical skills, including completion of a minimum number of procedures and/or cases, to achieve the specified level of competence (2,3). In addition, participation in ongoing research and the development of new activities is required. Typically, fellows have dedicated time to work on research activities and to participate as a co-investigator in single-center or multicenter studies; handling data collection, participating in study analysis, and presenting results at national/international meetings are all envisioned as part of the training program (2,3).

**EUROPEAN RESPONSE TO INCREASED MOVEMENT OF FELLOWS**

The movement of fellows-in-training across European countries in search of “skills and publications” in subspecialty training is a consequence of the basic European Union (EU) principle of free movement (4) that guarantees all EU citizens the right to travel, live, and work wherever they wish within the EU without visa requirements. Moreover, European medical training qualifications are automatically recognized throughout the EU member states, without the need for additional post-graduate examinations such as the United States Medical License Examination. This has resulted in a rising trend in European international fellowship programs. Centers with a tradition of advanced fellowship programs recognize the value in providing well-organized and dedicated posts, with invaluable benefits derived from the attraction of international fellows who are a source of productivity and enthusiasm.
In response to this development and to meet subspecialty training on a pan-European basis, the European Society of Cardiology (ESC) has created a limited number of specific grants and fellowships in a range of areas from basic science to invasive and noninvasive cardiac specialties (5). However, the majority of applicants still travel well-worn paths and rely on word of mouth in organizing self-arranged programs to satisfy an unmet need in their native environment. ESC initiatives such as CathGo (6) (an online database listing centers that are currently offering interventional training opportunities) have been created to further boost mobility and training across Europe and to link potential centers and fellows, which would otherwise be unknown to each other. Typically, these centers accept 2 to 3 international fellows per year, usually in combination with a higher number of local fellows.

THE BENEFITS AND THE HURDLES

The opportunity to work and train in a new country provides the additional unique benefit of experiencing alternative cultural backgrounds, different work practices, and complementary work philosophies. This promotes professional and personal development at an important stage in the fellow-in-training’s burgeoning career through the exchange of knowledge, while also providing an opportunity to challenge one’s own inherent assumptions and allow for the development of fresh perspectives in a new environment. Moreover, the ability to adapt to new environments and work with different teams represents an important educational experience.

Additionally, across Europe, several significantly different health care models are present, each with its own benefits and disadvantages. This alternative health care model exposure is a secondary benefit of an international fellowship, and provides a unique opportunity to enhance leadership and management skills. Only through the immersion obtained by working in such systems can the strengths and weaknesses of these alternative models be truly appreciated and analyzed; this may generate new ideas and questions for the traveling fellow, and allows the best of these ideas to be brought home to improve native practice.

Career-long research bonds developed during an international fellowship may help to create the next generation of international research consortia, and the growing importance of researcher mobility in the current global science system must be recognized. The mentor and fellow personal connection established during training can play a key role in facilitating collaboration through the expansion of professional networks and the fertilization of ideas, which may endure long after the program is completed. Opportunities to share and merge data, collaborate on new studies, and combine cohorts between countries may help to create larger study populations, which in turn leads to stronger study findings.

In Europe, research has long benefited from access to large, transnational, continent-wide networks, which encourage research excellence and which may find support from EU research funding. Emerging forms of isolationism, such as Brexit may have a profoundly negative influence on the flow of doctors and researchers, possibly resulting in the reduction of future successful collaborations (7). In contrast to the current ease of movement, Brexit may make the United Kingdom a less attractive destination for EU trainees, as a result of possible increased examinations and/or working visa requirements, potential limitations on free movement (between EU countries and the United Kingdom) and the risk of reduced opportunities for groundbreaking research as a consequence of potential reduced access to EU funding, such as the HORIZON 2020 (8). The HORIZON 2020 is currently the EU’s largest program for sponsoring research and innovation, with an €80 billion budget to be awarded to European researchers by 2020. Presently significant uncertainty exists, and the full effect of Brexit remains to be seen.

Although an international fellowship provides many unique advantages, it is not devoid of difficulties. First, fellowships often come with a financial challenge, resulting in a short-term pay reduction. Stipends, when provided either through home cardiac societies or through local investment, can typically help cover only basic expenses. Wisely, the ESC has developed a range of grants to help access training or research activities throughout Europe that might otherwise be unachievable. The second immeasurable but perhaps more significant cost pertains to the fellow’s family commitments, with many trainees choosing to leave spouses, significant others, and/or children at home for this period of training. On the other hand, this short-term sacrifice has nowadays become almost essential to gain experience in techniques and procedures that may otherwise be unavailable, providing the fellow with significant advantages when eventually returning to his or her native country. Moreover, in the increasingly competitive job market, a fellowship can be a deal maker, certainly in getting shortlisted and often
in finally securing a job “back home,” when other factors are similar.

**LOOKING TO THE FUTURE AND THE NEED FOR EUROPEAN FELLOWSHIP ACCREDITATION**

To improve education and training, the ESC and the Union Européenne des Médecins Spécialistes-Cardiology Section in collaboration created the European Board for the Specialty of Cardiology to meet the vital need for harmonization and standardization of these emerging fellowships (9). Consequently, guidelines for training duration, quality, and content have been established, and curricula for the main subspecialties of interventional cardiology (2), heart rhythm specialist (3), and heart failure specialist (10) have been produced. However, formal standardized accreditation across Europe by regulatory bodies and the various national societies is still ongoing, and significant heterogeneity may persist between fellowships and countries. The ESC e-Learning platform (11), a recent collaborative tool involving ESC Associations, Working Groups, and National Cardiac Societies, aims to harmonize training in the subspecialties around their respective curricula. This European platform, covering the main subspecialties fields of acute cardiac care, cardiovascular imaging, heart failure, heart rhythm, percutaneous interventions, and prevention and rehabilitation, provides an online store to collect and record training activities through an e-logbook and also provides content and courses to help prepare for subspecialty certification examinations. Unfortunately, at present these certifications do not guarantee formal European accreditation, which remains within the jurisdiction of the medical licensing authorities of the individual countries. In this regard, there remains a vital need for a European universal accreditation process in the near future, and universal accreditation is essential if such fellowship programs are to succeed. With this in mind, a look toward the American Board of Internal Medicine certification system may help to plan this route.

**THE HOPE**

International subspecialty fellowships are frequently the best opportunity to become the “cardiologist of tomorrow” with subspecialty skills and to provide a unique and exciting development in training. To become a truly European cardiologist of tomorrow, these international exchange programs are to be encouraged and embraced. Personally, we support these novel exchanges, which represent an innovative path for further training and highlight the attempts in European cardiovascular training to keep abreast with our rapidly evolving specialty.

**ADDRESS FOR CORRESPONDENCE:** Dr. Enrico Fabris, University of Trieste, Cardiovascular Department, “Ospedali Riuniti” and Postgraduate School of Cardiology, Via Valdoni 7, 34129 Trieste, Italy. E-mail: enrico.fabris@hotmail.it.

**REFERENCES**

RESPONSE: Beyond European Fellowship Training

Building a Global Family of Cardiologists

Christoph Bode, MD, MD (HON), Chairman
Department of Medicine III, University of Freiburg, Freiburg, Germany
E-mail: christoph.bode@universitaets-herzzentrum.de

My qualifications for becoming chair of the Assembly of International Governors of the American College of Cardiology (ACC) were likely my Italian grandmother, French mother, German wife, American son, and Thai grandson. Global internationalism is regarded within the family as a cultural treasure. Medicine in general and cardiology in particular are international sciences, because the subjects we deal with—humanity, the human body, and the human heart—are the same all over the world.

We who practice cardiology are blessed, because we can truly care for humankind all around the world. We can take care of the whole family. Therefore, from my perspective, it appears to be logical that cardiologists should be enabled to receive education, to learn (from each other), and to practice medicine on a global scale. Both the ACC and the European Society of Cardiology have developed fellowship training programs that aim at realizing just this goal. In Europe, common guidelines and harmonized accreditation for subspecialties facilitate international exchange. This allows for the best centers to select the best fellows from a much larger, international pool of applicants for basic, translational, clinical, or health economy research programs. The European Society of Cardiology, helped by the political will of the European Union, has taken a leading role on this continent.

The biggest hurdle is the language barrier that many colleagues face when they leave their home country in Europe. Learning the language of the patients in the receiving country is a mandatory requirement for every physician who wants to practice abroad. The knowledge of English is probably enough for a research fellowship or for just being trained in a certain interventional technique. However, to be able to responsibly deal with patients, command of the patients’ language is mandatory.

Given this basis, fellowships, including international subspecialty fellowships, offer important perspectives that are not achievable for “homegrown” physicians. Again, I should like to offer not only a European or American, but also a global perspective. Learning about different cultures and approaches is a priceless experience. Meeting colleagues from other centers or countries is essential for future cooperation and further developments, for example, in basic research or conductance of multicenter studies. Adapting to different environments or cultures opens up the individual mind, helps to organize her or himself when transferring back acquired new insights to the home institution.

Global fellowship training allows for the fastest and most future-oriented development of our field by means of optimal use of global human resources. This serves our patients throughout the world, our field of expertise, and also our personal development as specialists—and beyond that as human beings.

For the luckiest of us, it makes for a great family. I plead for a global family of cardiologists.