



COMMENTARY

International Exposure to Cardiovascular Training

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I recently read an article entitled International subspecialty Fellowship training, *the Path for Cardiologists of Tomorrow?* A European perspective by Enrico Fabris and Mark Kennedy in JACC vol. 69, No 9, 2017 page 2000–2002. This piece stimulated me to think about my own career and how it related to some training outside the USA. I did not travel to Europe during my fellowship at Johns Hopkins, since, at the time, the major diagnostic test was coronary angiography, which was much more commonly performed in the USA and was my main interest as a fellow trainee. Cardiac ultrasound was just developing, nuclear studies were almost nonexistent, electrophysiology consisted of reading ECG's, heart failure, including transplantation was just evolving and heart failure medical therapy was not nearly as sophisticated as it is now. As a result, it was unlikely that most US trainees would travel to learn about coronary angiography.

Research as a Cardiovascular Fellow at Hopkins

My first assignment was to work in the surgical dog lab using diastolic augmentation, as the main therapy for acute myocardial infarction in order to abort or at least limit the size of the myocardial infarction created by the ligated coronary artery and theoretically preserve myocardium [1]. As far as I can recollect, we never used the device in patients with acute myocardial infarction.

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This preliminary work eventually led to the development of the intra-aortic balloon that accomplished the same goal, but more efficiently.

Following that three month experience, I spent the next twenty months working mostly in the adult cardiac catheterization laboratory. My focus of interest was ischemic heart disease and I was fortunate to spend a great deal of time learning how to do coronary artery angiography.

During my time in the catheterization laboratory, we studied Xenon coronary blood flow, atrial pacing induced tachycardia resulting in myocardial ischemia [2], and evaluation of lactate metabolism, in patients with ischemic heart disease. Investigation of coronary artery disease in the cardiac catheterization laboratory was done on a research protocol, since revascularization with surgery or percutaneous intervention did not yet exist.

However, probably the most important piece of work that came out of that laboratory was the prognostic importance of coronary artery disease related to the severity of the coronary artery angiography and the results related to randomization of unstable angina patients to acute medical therapy and urgent coronary artery bypass grafting plus medical therapy [3, 4].

Interest in Ventricular Function

After becoming a young faculty member I became interested in evaluating ventricular function and in 1972, I applied for and obtained a traveling fellowship of the Royal Society of Medicine in order to learn more about the “catheter tip velocity transducer” and its use in the catheterization laboratory to assess LV function. This device was being

used to assess cardiac function at the Royal Post Graduate medical school at Hammersmith Hospital in London by Drs. Chris Mills and Ivor Gabe.

Hammersmith Experience

I spent two and a half months at that institution working under the direction of Professor Jack Shillingford which were quite important to me in my development as a cardiologist. It allowed me to learn how things are done outside the US as well as to meet individuals who later became good friends; for example, Desmond Julian (the father of the CCU concept), who I met in Edinburgh and see frequently at the annual meetings of the European Society of Cardiology. I also had the opportunity to present data from the unstable angina NHLBI study at Hammersmith medical grand rounds and got important feedback from British colleagues about the important study that I was involved in at Hopkins, i.e. the NIH sponsored randomized trial of patients with unstable angina. (patients were randomized to acute medical therapy or urgent coronary artery bypass surgery plus medical therapy.)

International Cardiology

Being in London and in Europe more or less stimulated me to get involved with international cardiology, which I did before and during my Presidency of the ACC and continue to do. One of the things that I was interested in during my early days as a faculty member at Hopkins was the assessment of ventricular function in patients with normal aortic valves. Some work was performed at the NIH on this subject, by Chris Mills and Ivor Gabe, who then migrated back to London and Hammersmith Hospital. The traveling fellowship of the Royal Society of Medicine allowed me to spend some time with these individuals. This time was used to learn more about using the catheter tip velocity transducer in the catheterization laboratory. Coronary artery bypass grafting did not begin at Hopkins until 1969, after René G. Favaloro initiated this procedure at the Cleveland Clinic on May 9th 1967. I had the pleasure of meeting this internationally prominent person at the American Heart Association annual conference in Dallas as a young

faculty cardiologist, (I rode a bus to the meeting venue with him) and later in Buenos Aires, as a slightly older cardiologist as well as an invited faculty, at a conference in his honor.

Travel with My Family

The time I spent at Hammersmith provided me with an additional spinoff advantage, since, my family, (Ruth, Jill, Jamie, Jennifer, and Richard) could accompany me to Europe. We did not have much money but we were able to rent a flat in Richmond, Surrey, outside of downtown London from which I traveled every day by underground to Hammersmith Hospital. Prior to arriving in London, we travelled to Switzerland and spent 2 weeks skiing in San Moritz. So we had a winter vacation associated with my medical experience in London.

This was a wonderful opportunity for Ruth and I. Our children attended British schools for a few months, which I think benefitted them as well.

An Irish Registrar at Hammersmith

I had the pleasure of meeting Brian Mauer, registrar to Professor Shillingford, and Brian's wife Timmy. Prior to our return to USA, Brian and Timmy hosted a farewell dinner for us at their home in London. Later in his life, Brian who was living in Dublin, was captain of Lahinch, a famous and difficult golf course in Ireland. He and other Irishmen, along with several Americans initiated the William Harvey Golf tournament that is played every other year in USA, UK/Ireland, and continental Europe by American, British/Irish and continental European cardiologists [3]. Brian was a prominent Irish cardiologist involved with the Irish government and the practice of cardiology in Ireland. I kept in touch with Brian until his death in 2013.

Conference in Edinburgh

Another advantage of my time at Hammersmith was that during the time I spent in London, I was able to attend a conference in Edinburgh directed by Desmond Julian and Michael Oliver. I got to know these two individuals fairly well and have kept in

contact with Desmond Julian (Julian first initiated the concept of the coronary care unit in Sydney, Australia) many years ago.

How I Benefitted from My Experience in Europe

I learned a lot about British people and British cardiology i.e., I learned how clinical cardiology and research is done in the United Kingdom, (slightly different than at Hopkins), I learned about the British use of coronary angiography, I learned about travel in Europe and how people lived in London, I met many interesting international people e.g. Brian Mauer, Desmond Julian, Michael Oliver, Jack Shillingford and many others and I learned plenty about the catheter tip velocity transducer from Chris Mills and Ivor Gabe. This gave me the opportunity

to take what I learned back to USA and Hopkins. This in turn allowed me to apply for and be awarded an NHLBI RO1 to study the catheter tip velocity transducer device in humans [5]. It also set the tone for the rest of my life as a clinical cardiologist with international interests and connections.

Conclusion

I agree with Fabris and Kennedy that exposure to training outside of US Fellowship is worthwhile and provides the trainee a broader view of the multiple specialties currently available in cardiovascular medicine, that were not available to me during my fellowship training, but became available to me, later in my career as a young faculty person and most certainly led to *a path for cardiologists of tomorrow*.

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