

RSNA Committee on International Radiology Education: 25 Years of Global Education Outreach

*Claudio F Silva, MD, MSc
Guillermo Elizondo-Rojas, MD
Omolola Atalabi, MD, MBBS
Musturay Karçaaltincaba, MD
Giovanni Morana, MD
Umar Mahmood, MD, PhD
On behalf of the CIRE members*

Abbreviations: CIRE = Committee on International Radiology Education, DHN = Derek Harwood-Nash, EMJA = Education Materials and Journal Award, GLC = Global Learning Centers, IRIYA = Introduction to Research for International Young Academics, IVP = International Visiting Professor, RSNA = Radiological Society of North America

RadioGraphics 2020; 40:1938–1952

<https://doi.org/10.1148/rgr.2020200100>

Content Codes:  

From the Department of Radiology, Clínica Alemana de Santiago, Facultad de Medicina Clínica Alemana, Universidad del Desarrollo, Santiago, Chile (C.F.S.); Department of Radiology, Dr José Eleuterio González University Hospital, Monterrey, Mexico (G.E.R.); Department of Radiology, University of Ibadan, University College Hospital, Ibadan, Nigeria (O.A.); Department of Radiology, Hacettepe University School of Medicine, Ankara, Turkey (M.K.); Department of Radiology, Ospedale Regionale Ca Foncello Treviso, Veneto, Italy (G.M.); and Department of Radiology, Massachusetts General Hospital, Boston, Mass (U.M.). Received April 29, 2020; revision requested May 7 and received May 22; accepted May 28. The authors M.K. and G. M. have provided disclosures (see end of article); all other authors have disclosed no relevant relationships. **Address correspondence** to C.F.S. (e-mail: csilvafa@alemana.cl).

©RSNA, 2020

The Radiological Society of North America (RSNA) Committee on International Radiology Education (CIRE) has worked for the past 25 years to create academic programs oriented to the needs of international radiologists. The CIRE develops organized and structured approaches to help build one's capabilities and increase one's capacity for professional growth, which then facilitates better patient care. The authors describe the four programs that CIRE is responsible for and introduces its newest initiative, Global Learning Centers, which is planned to start in 2021. RSNA involvement in global radiology education provides opportunities for early, mid-, and late-career radiologists to participate in these programs as students or teachers. The authors describe some of the programs' success stories and invite readers to become a part of and contribute to the growth of radiologic academic endeavors globally.

©RSNA, 2020 • radiographics.rsna.org

Introduction

To support and foster radiology education in resource-limited countries, the Radiological Society of North America (RSNA) has built, funds, and stimulates a number of initiatives that reach out to academic radiologists and trainees. The purpose of these efforts is to encourage all radiology groups to grow their knowledge and, as a result, better assist their patients. Only by creating strong bonds and long-lasting relationships can our specialty keep developing and continue to be such a relevant part of medical decisions and therapies.

The RSNA has worked to provide academic, logistic, and administrative support by creating efforts such as the Committee on International Radiology Education (CIRE) that this year will have accomplished 25 years of uninterrupted work, with initiatives such as the International Visiting Professor (IVP) program, Derek Harwood-Nash (DHN) International Fellowship, Introduction to Research for International Young Academics (IRIYA) program, and Education Materials and Journal Award (EMJA) program. These initiatives have been adapted over time to meet the needs and requirements of our specialty, both in research and educational capabilities, with the RSNA committee members being highly responsive to modifications suggested by stakeholders. Most of these changes have been accomplished on the basis of feedback from professors, attendees, alumni, and the ever-growing CIRE community directly involved in these endeavors. These initiatives have also been assembled with the necessary funding and support of successive RSNA Boards of Directors, who have acknowledged these programs as necessities for the global radiologic community and as core components of the mission and vision of the institution.

The RSNA is introducing its newest international academic outreach program, the Global Learning Centers (GLC), to leverage advances in technology that enhance our efforts for sustained

Table 1: Former CIRE Chairpersons and Terms

Name	Term
Peter Cockshott, MD	1985–1989
Philip Palmer, MD	1989–1992
Claudia Henschke, MD	1992–1996
Anne Osborn, MD	1996–1999
Pablo Ros, MD	1999–2002
Barry Goldberg, MD	2002–2006
George Taylor, MD	2006–2009
William Mayo-Smith, MD	2009–2012
Teresita Angtuaco, MD	2012–2015
Kristen DeStigter, MD	2015–2018
Claudio Silva, MD, MSc	2018–2021

learning. To provide insight into the latter, we will explore the development of CIRE to its current structure, the existing programs, and the future of this committee.

Historical Perspective

The RSNA has had a long-standing commitment to international outreach and is involved in a variety of initiatives to look for innovative ways to build networks and long-term relationships with academic and clinical radiologists from all over the world. The approach has been to enable knowledge transfer and better assist, for all those who might be in need, with ways to optimize (in many cases limited) resources and provide better care for patients in the realm of diagnostic imaging.

Regarding this international extension, there are documents from 1982 that mention proposals to the RSNA Board of Directors to establish a fund allowing “travel fellowships for the Annual Assembly” (1) and the development of a program for “Continuing Medical Education for Third World Radiologists” (2). By 1983, there was a proposal to donate 200 copies of *Radiology* to “third world countries.” Registered in the minutes from September 1984, agenda item 22, is the creation of an ad hoc committee to study how the RSNA could assist in education in resource-limited countries (3).

Peter Cockshott, MD, (1926–1993) from Hamilton, Ontario, Canada, was appointed chairman of this newly created committee, answering directly to the Chairman of the Board. Dr Cockshott (an RSNA Gold Medal recipient in 1991), having worked at the World Health Organization and the Pan American Health Organization, had a perfect sense of what would be needed to organize such an endeavor (4). He put together the first key description for future members of this committee, which is paraphrased as follows:

RSNA members, who have a solid background in education, with experience working or lecturing in developing countries, with expertise in different disciplines, and a diversity of geographic expertise (5). The elements of this description have remained untouched to the present day.

In September 1985, the committee was renamed the RSNA Ad Hoc Committee for Radiology Education in Evolving Nations (6). Also at that meeting, areas in need of immediate help were identified, including providing RSNA audiovisual materials and subscriptions to *Radiology* and *RadioGraphics* for three institutions designated by the committee. The University of Nairobi, Nairobi, Kenya; University of Yaoundé, Yaoundé, Cameroon; and the International University of Rabat, Rabat, Morocco, were the first selected. Also, visiting faculty travel programs (referred to as International Visiting Professorships) were to be executed effectively in 1986.

In November 1987, the RSNA Board of Directors voted to remove the ad hoc status of this committee, place it under the direction of the Liaison for Education, and rename it as the RSNA Committee on Education in Evolving Nations (7). Its first formal charge was established: “To pursue programs to enhance and elevate the level of radiological education in evolving nations (7).”

By 1996, the Committee on International Radiology Education took its definitive name, and the primary objectives, programs, and structures were defined (8). In 2007, an update was made to the committee’s charges, which are available on the RSNA website (9).

For the period between 1998 and 2012, this committee was known as the Committee on International Relations and Education, until the creation of the Board Committee on International Affairs. Since then, CIRE has been used as the acronym for the Committee on International Radiology Education. Since its creation, many RSNA members have served in this endeavor. Table 1 presents the list of CIRE chairs from the year 1985 to the present day.

CIRE Programs

The CIRE, since its beginning as the Committee for Radiology Education in Evolving Nations, has been devoted to finding the means to provide continuing medical education for radiologists around the world. Since 1986, when the first IVP program took place, the critical goal was to build stronger bonds to and from the RSNA to the global radiology community. To date, CIRE has four main active programs (IVP program, DHN International Fellowship, IRIYA program, and EMJA program), with a fifth program (GLC) starting its pilot run in 2021 with plans for a full-fledged initiative in 2022.

International Visiting Professor Program

Created in 1985, the IVP program had Dr Edmund A. Franken, Jr, of the University of Iowa, as its first visiting professor, who visited the University of Nairobi in 1986 (10). To date, this program has supported 124 visits to 48 countries and deployed more than 300 professors in teams of two to four members (Table 2, Fig 1) (11). For 2020, visits were scheduled for Mexico and Kazakhstan but owing to the novel coronavirus 2019 (COVID-19) pandemic have been postponed to 2021.

This program supports small teams of visiting professors to lecture at national or regional radiology meetings of societies in or serving resource-limited nations, as well as at selected host institutions with radiology residency training programs in those countries. Any RSNA member may apply to be a visiting professor. All applicants are added to a database, along with the following considerations: subspecialty, language(s) spoken, and preferred countries to travel to. The IVP subcommittee selects the visiting professor candidates on the basis of the previously mentioned information in the database and on the educational needs identified in the host society application.

A typical trip length is 2 weeks of academic commitment, which entails coordination with the local liaison to ascertain the needs and expectations for the professor stay. All educational content is developed by the IVP team on the basis of those needs identified in the host's application. This program covers the costs of emergency medical insurance, round-trip airfare, and ground transportation within the United States, as well as the costs associated with visa procurement. The host society is responsible for providing ground transportation within the country, meals, and hotel accommodations.

Reports of many extraordinary experiences have been published that convey the impact of this program (12–15). In the following interview, Carlos Torres, MD, FRCPC, comments on his work during his IVP visits to El Salvador (in 2012) and Mongolia (in 2016) (Fig 2).

Dr Carlos Torres.—Dr Torres is Associate Professor of Radiology at the University of Ottawa and has been a staff neuroradiologist at The Ottawa Hospital since 2008. Born in Colombia, Dr Torres has spent most of his career in North America, yet he has never forgotten his heritage and upbringing in a resource-limited country. His first IVP program experience was in 2012 in El Salvador. Since then, he has been considered to serve as Outreach or International Visiting Professor for RSNA and other radiologic societies (including the American Society of Neuroradiology in 2018 and the American Roentgen Ray

Table 2: Countries Represented in the IVP Program from 1986 to 2019

Year	Countries Represented
1986	Nigeria
1987	Kenya
1988	Jamaica
1989	Pakistan
1990	India, Malaysia
1991	Kenya, West Indies
1992	Fiji, Kenya, Malaysia
1993	Chile, Jordan, Latvia, Lithuania
1994	India, Malaysia, Mexico, Nepal, Thailand, West Indies
1995	Chile, Ecuador, India, Kenya, Malaysia
1996	Ukraine
1997	Ecuador, India, Syria
1998	Ecuador, India
1999	Brazil, Hungary, Lithuania, Turkey
2000	Ecuador, Ethiopia, Sri Lanka
2001	Bolivia, Brazil, Ecuador, India, Nicaragua, Uruguay
2002	Colombia, Fiji, New Zealand, Peru, Singapore, Thailand
2003	El Salvador, Guatemala, South Africa
2004	Argentina, Mexico, Romania
2005	Brazil, Mexico, Sri Lanka, Thailand
2006	Chile, India, Lithuania, Malaysia, Mexico
2007	Algeria, Honduras, Mexico, Uganda
2008	China, Mexico, Nigeria, Vietnam
2009	Argentina, Bolivia, Estonia, Mexico, South Africa
2010	Brazil, Mexico, Philippines, Thailand
2011	Malaysia, Mexico, Lithuania, Myanmar
2012	Nepal, Vietnam, Mexico, El Salvador
2013	Russia, Kenya, Mexico
2014	Argentina, Brazil, South Africa, Mexico
2015	Chile, Nicaragua, Mexico
2016	Mexico, Mongolia, Philippines, Ghana
2017	Indonesia, Latvia, Malaysia, Mexico, Peru, Sri Lanka
2018	Bosnia and Herzegovina, Guatemala, Indonesia, Mexico, Tanzania, Uganda
2019	Ghana, Mexico, Myanmar, Nigeria, Thailand, Uruguay

Society in 2019). He has also visited multiple academic centers in the United States and Canada, as well as in Asia (Bhutan, China, Myanmar, and Mongolia) and Central and South America (Brazil, Colombia, El Salvador, and Chile).

Dr Torres has given more than 300 national and international invited lectures in 25 different countries and is regularly invited to speak on a wide range of neuroradiology topics at all the major radiology and neuroradiology meet-

International Visiting Professor Visits



Figure 1. Map shows the distribution of IVP program host countries (circles) from 1986 to 2019. The circle size corresponds to a larger concentration of participants from that region. (Keys are the same for Figures 3, 5, 7, and 9.)



Figure 2. Carlos Torres, MD, FRCPC (left), shown with colleagues (right), participated in the IVP program in 2012 and 2016.

ings. Actively involved in medical education and research, Dr Torres has authored multiple peer-reviewed publications and 18 book chapters. He has received numerous departmental, national, and international awards for teaching and research, including the 2017 RSNA Honored Educator Award.

How did you hear about the IVP program, and what led you to apply?

C.T.: Through my mentor, friend, and former Program Director of the Neuroradiology Fellowship Program at McGill University, Dr Raquel del Carpio, as she was one of the members of the RSNA IVP team [who] traveled to China in 2009.

I am passionate about education and about sharing knowledge and connecting with colleagues from other institutions and other countries, hence my choice to follow an academic career. I felt that by joining the IVP program, I would be able to transcend my institution, and I would be able to contribute to the radiology training of residents in developing countries in Latin America, Africa, or Asia.

Please describe your experience participating.

C.T.: I was fortunate to participate as a member of the IVP program team that traveled to Mongolia in 2016, along with Dr Theresa McLoud from MGH [Massachusetts General Hospital], Harvard University, in Boston [Mass], and Dr Musturay Karçaltincaba from Hacettepe University School of Medicine in Ankara, Turkey. The overall experience was extremely positive, and I believe our visit made an impact on the radiology community in Ulaanbaatar. We encountered a lot of enthusiasm, and both the faculty and the radiology residents we met were eager to learn. As their radiology training program is shorter than [those] in North America, and there is no subspecialty training, the residents were grateful for the practical teaching points and pearls they learned from the didactic lectures and for the great discussions we had during the read-out sessions at the view box.

In addition, we had the opportunity to share quality time with our hosts. We enjoyed delicious typical meals with them, and we learned a lot about their country's history and culture. It is a

Derek Harwood-Nash Fellows

Countries of Origin

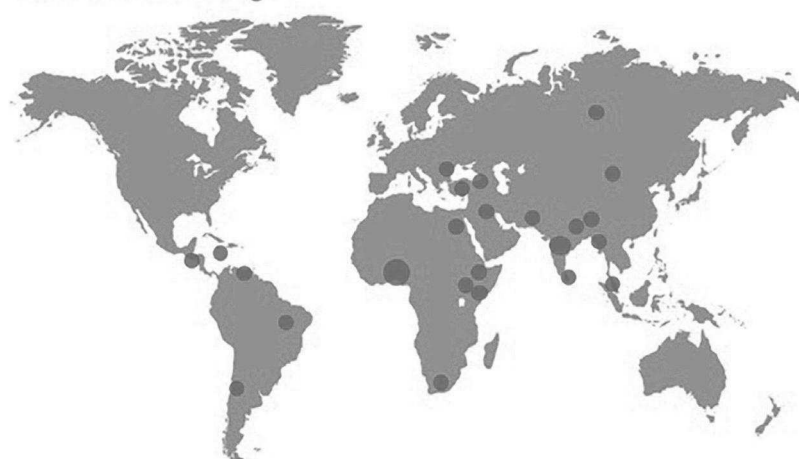


Figure 3. Map shows the distribution of the countries of origin of the DHN fellows from 1998 to 2019.

truly beautiful country with breathtaking national parks and rivers, as well as the unique steppes of central Asia. Furthermore, we established new long-lasting friendships with the other members of the IVP team, another highlight of the program.

In summary, my participation in the RSNA IVP program has been, without a doubt, one of the highlights of my academic career, and I highly recommend it to anyone interested in teaching and education.

What did you learn? What do you see as the benefits of participating?

C. T.: Having grown up in a developing country, I understand firsthand the importance of the IVP program, aimed to enrich the radiology residents' educational experience.

I also believe that the impact of the visit goes beyond the local teaching experience, as some of the residents and faculty get excited about the idea of getting additional training in Canada and the United States. In fact, after my visit to Mongolia, one of their radiologists applied and was accepted for a fellowship position in diagnostic neuroradiology at the University of Ottawa in Canada. He became the first Mongolian doctor in medicine to be accepted to an accredited training program in North America. Therefore, he has paved the road for future generations of radiologists in his country who would like to follow the same path. We are confident that upon his return to Mongolia, he will help reshape the radiology training programs in the country, and he will, in turn, teach and mentor the new generations of Mongolian radiologists. This great story that stemmed from the RSNA IVP program will hopefully redefine the future of radiology in that beautiful country.

This program is absolutely wonderful. It gave me the opportunity to share unique academic and cultural experiences with the residents and staff radiologists from Mongolia. Over time, the visit has proved mutually beneficial and has resulted in long-lasting relationships and collaborations. In addition, I had the privilege to share those experiences with Dr McCloud and Dr Karcaaltincaba, who have since become dear friends.

DHN International Fellowship

Named after Derek Harwood-Nash, MD, DSc (1936–1996), founder of the RSNA Research and Education Fund and a member of the RSNA Board of Directors (16), the DHN International Fellowship was created in 1997 to allow a junior faculty member from an international radiology academic program to study at a North American institution. This program enables early and midcareer radiologists to acquire specific training in an area of their interest, and one that is needed in their country, at a highly prestigious academic institution in the United States or Canada (17). This program has (as of April 2020) 48 alumni from 25 different countries (Fig 3, Table 3), and initially had one fellow per year (1998–2003), later two (2004–2012), three (2013–2016), and finally the current four participants per year (since 2017).

This program supports international scholars pursuing a career in academic radiology to participate in an observership at a North American institution. All applicants are required to have had formal radiology training and have held a faculty position at an academic institution for no less than 3 and no more than 10 years. During the candidate's application process, they are asked to identify where they would like to train,

Table 3: DHN Fellows by Country from 1998 to 2020

Year	Countries Represented
1998	Kenya
1999	Ethiopia
2000	Nigeria
2001	Egypt
2002	Nigeria
2003	Georgia
2004	Nepal, Romania
2005	Pakistan, China
2006	India, Russia
2007	Nigeria, South Africa
2008	Nigeria, India
2009	Turkey, Brazil
2010	Iraq, Nigeria
2011	Egypt, Jamaica
2012	Bhutan, Chile
2013	El Salvador, South Africa, Venezuela
2014	Kenya, Malaysia, Sri Lanka
2015	Uganda, India, Nepal
2016	Nigeria, India, Myanmar
2017	India, South Africa, Egypt, India
2018	South Africa, Turkey, Uganda, Myanmar
2019	South Africa, Myanmar, Tanzania, Pakistan
2020	Albania, Indonesia, Nepal*

*Owing to the COVID-19 pandemic, the 2020 DHN fellowships will take place in 2021.

based on a list of institutions that have expressed a willingness to participate in the program. Once the DHN International Fellowship subcommittee from CIRE has selected the top four applicants, it matches the participant with an institution on approval from the RSNA Board of Directors.

This fellowship has a planned length of 6–12 weeks, and CIRE recommends scheduling the DHN fellow's observership around the RSNA Annual Meeting, if possible, to make the most of his or her experience. The RSNA provides a stipend for basic expenses (up to \$10 000 as of April 2020) for each accepted candidate. The DHN fellow is asked to submit a written report regarding his or her experience, and the host institution is requested to complete an evaluation of the participant and overall experience. More information is available on the RSNA website (18).

From this program have arisen some of the most distinguished academics in resource-limited countries who have, on return to their hospitals when they completed their fellowship, contributed to their radiologic communities. By building links with academic institutions in North America and by using their newly acquired knowledge, the DHN fellows have developed or strengthened

training programs and local radiologic societies and have assisted the RSNA in international committees such as CIRE, the International Advisory Committee, and the Regional Advisory Committees. One of these extraordinary successful fellows is Omolola Atalabi, MD, MBBS, from Nigeria.

Omolola Atalabi, MD, MBBS.—Dr Atalabi (Fig 4) is a Professor of Radiology at the University of Ibadan, where she holds the position of Chair of the Department of Radiology. Born and raised in Nigeria, she completed her internship and residency at the same hospital that is her current workplace. Since the early age of 8 years, she knew that she wanted to be “a doctor who looks at broken bones of children on plastic pictures.” She took a huge step toward achieving this dream when she was selected to be a DHN fellow at Boston Children's Hospital in Boston, Mass, in 2007. Her mentor there was Dr George Taylor who, together with the members of the pediatric radiology group, provided her with much-needed experience and mentoring to nurture her academic desires.

Since her return to Nigeria, she has been an enthusiastic promoter in education, building networks with the West African societies and the RSNA. She has held leadership positions such as president of the World Federation of Pediatric Radiology, of the Society of Pediatric Imaging in Nigeria, and of the Association of Radiologists in Nigeria at different periods. At the RSNA, she has been part of the CIRE (currently chair of the IVP-GLC subcommittee), International Advisory Committee, and Regional Committee for the Middle East and Africa. Dr Atalabi has authored 70 articles in peer-reviewed local and international journals, in the subjects of both general radiology and pediatric radiology, in addition to three book chapters.

What sparked your initial interest in radiology?

O.A.: In medical school, we believed radiologists are the only ones who can see in the dark what others cannot see in daylight, so I became inquisitive, and I wanted to have the experience.

Why did you pursue a career as a radiologist?

O.A.: Radiology is a specialty that allows me to practice every aspect of medicine. You have to know everything! It gives [you] a good feeling when, with correct radiologic diagnosis, you make a difference to patients' management.

How did you hear about the DHN program, and what led you to apply?

O.A.: After my first RSNA [Annual Meeting] attendance in 2003, I realized that there are opportunities for international members. I went online, and

DHN was the only program I qualified for, as it was meant for radiologists in their early careers.

Describe your experience participating.

O.A.: Participating in DHN sparked off my interest in pediatric radiology. I was matched with a fantastic mentor, George Taylor, who did an excellent job in mentoring me. Through our regular meetings, I discovered that there are many opportunities for me to develop my career path in pediatric radiology back in my home country, even without all the state-of-the-art equipment. The entire pediatric radiology faculty and staff [at] Boston Children's Hospital kind of adopted me, and everyone tried to make me feel at home. I learned a lot under a relaxed ambience. At the end of 10 weeks, I had coauthored four articles.

What did you learn? How did this help shape your career? What do you see as the benefits of participating?

O.A.: I learned and developed my reasoning ability, which enabled me to create simple and practicable research questions, with beneficial outcomes within the limits of the resources available to me in my environment. I also learned that I needed a research team and [to] collaborate with others for me to make a headway in academics.

How has your career grown since participating?

O.A.: [I had written] three or four publications before I had my DHN experience; I now have [written] over 70 papers and counting and have authored and coauthored three book chapters. I have risen from the position of Lecturer I to a full Professor, and I am now the head of the radiology department at my university hospital.

What would you describe as the most significant professional challenge you face today?

O.A.: To be at par with the rest of the world in imaging practices. It is very frustrating when I go [to] conferences and come back home without being able to put into practice what I have seen or learned. We are really far behind the rest of the world.

What is the biggest reward?

O.A.: I have several "biggest" rewards. When I can make a difference, no matter how little, I feel so happy. For example, I have been able to facilitate [assistance from] some outreach programs to my institution like RAD-AID [International], [which gave us] us [a] PACS [picture archiving and communication system] and helped to build our Interventional Radiology unit. With my encouragement, many radiologists from Ni-



Figure 4. Dr Omolola Atalabi was a DHN fellow at Boston Children's Hospital in Boston, Mass, in 2007.

geria are now attending international radiologic conferences like the RSNA, ECR [European Congress of Radiology], etc. As Chair of the RSNA ICMA [Regional Committee for Middle East/Africa], I was able to facilitate discounted membership fees for those of us from the developing world, in addition to travel fellowships, and [much] more.

How does your membership with RSNA help you in your daily practice?

O.A.: There are still some practical takeaway points from RSNA that I have brought back home. For example, I have been able to make radiologists more visible to both the patients and the other colleagues in other specialties in the hospital. There are some simple tips on techniques, which I learned at the meeting, especially in ultrasound, which have helped to improve our diagnostic acumen. I have also attended leadership courses at RSNA that have prepared me for my role as chair of my department.

Introduction to Research for International Young Academics

RSNA created the IRIYA program in 2002, with the focus to identify young international radiologists who wish to pursue a career in academic radiology. It is aimed toward residents and fellows currently in radiology training programs from both emerging and industrialized countries or radiologists who are not more than 2 years out of training. Applicants must be nominated by their radiology department chair or training director

Resident Researchers (IRIYA)

Countries of Origin

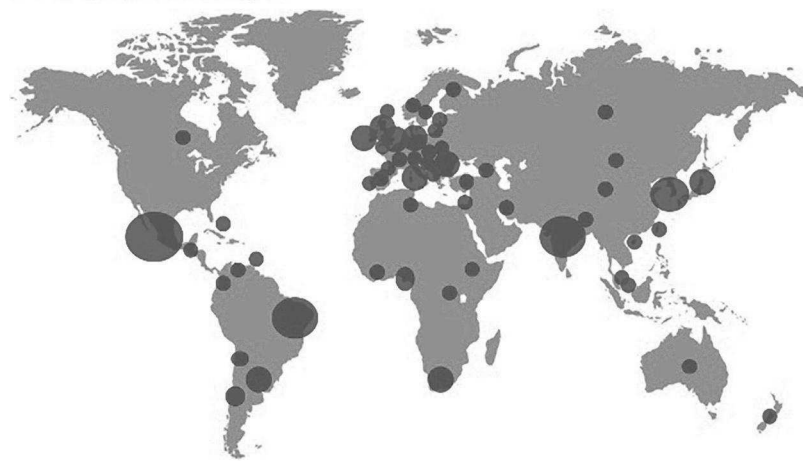


Figure 5. Map shows the distribution of the countries of origin of IRIYA program participants from 2002 to 2019.

Table 4: Number of Participants per Country in IRIYA Program from 2002 to 2019

Country	Participants per Country
Afghanistan, Algeria, Bahamas, Bulgaria, Canada, Côte d'Ivoire, Democratic Republic of Congo, El Salvador, England, Ethiopia, Finland, Hungary, Indonesia, Kenya, Morocco, Norway, Poland, Russia, Scotland, Sweden, Trinidad and Tobago, Tunisia, Venezuela	1
Israel, Latvia, Macedonia, Malaysia, Mongolia, Nepal, Singapore, Switzerland, Thailand, Ukraine	2
Albania, Australia, Colombia, Croatia, Georgia, Iran, Lithuania, Philippines	3
Austria, Belgium, China, Egypt, France, Nigeria, Portugal, Spain, Taiwan	4
New Zealand, Turkey	5
Chile	6
Argentina, Ireland, The Netherlands	7
Romania	8
Germany	9
Japan	11
Republic of Korea, South Africa, United Kingdom	13
Italy	16
Brazil	17
India	24
Mexico	34

who ascertains that the candidate has shown a sincere interest in academic radiology during training and would benefit from this introductory course.

Fifteen candidates are chosen each year to participate in a 5-day program that focuses on academic radiology and is held during the RSNA Annual Meeting. Participants receive a travel stipend and shared hotel accommodations. The topics that are usually discussed during these sessions include (a) designing and planning clinical research studies, (b) basic statistical notions, (c) research ethics, (d) evidence-based medicine evaluation of literature, (e) preparing a

manuscript, and (f) academic pathways, with an emphasis on international challenges and opportunities. More information is available on the RSNA website (19).

During the past 18 years, 298 radiologists from 66 countries have participated (Fig 5) (Table 4). A significant number of them have continued on an academic path and are distinguished in their respective countries, both in teaching and research.

Two participants with such success are Monika Arzanauskaite, MD (United Kingdom), and Federica Vernuccio, MD (Italy), who participated in the 2017 IRIYA program, created a research



Figure 6. Dr Federica Vernuccio (left) and Dr Monika Arzanauskaite (middle) participated in the 2017 IRIYA program. Dr Vernuccio and Dr Arzanauskaite are shown with 2017 IRIYA alumni during one of the sessions (right).



network with other attendees, and published the results of such efforts (20) (Fig 6). Also, both received the Trainee Research Prize (in cardiac and abdominal imaging, respectively) during the RSNA 2019 Annual Meeting. In the following section, they share some of their impressions of this experience.

What sparked your initial interest in radiology? Why did you pursue a career as a radiologist?

F.V.: As a medical student, I had not considered the option of being a radiologist until the last year of medical school because I consider[ed] radiologists [to be] quite far from being clinicians. I was so wrong. Indeed, in the last year of residency during a rotation in the radiology department, I realized that being a radiologist was one of the most exciting and comprehensive medical specialties. We, radiologists, need to combine our clinical and surg[ical] knowledge with radiologic skills to provide a diagnosis. Our reports and our contribution to the multidisciplinary meetings are fundamental to guide all the others toward the best patient management. After only a few weeks in the radiology department as an intern, I felt that all the clinical and surgical knowledge I had learned during the 6 years of medical school were making sense. As a radiologist, I could serve the patient at the highest level.

M.A.: Like many medical students, I had not had much exposure to radiology. However, once, out of the blue, my father gave me a book for my radiology rotation. It was Dr Peter Renton's *Medical Imaging*. I vividly remember the introduction to the book by Dr Michael Rubens (who, years later, by a beautiful coincidence became one of my teachers) [and the] layout and content of the book and myself thinking that it seemed quite an exciting field. Later, I discovered that radiology was a very quickly evolving, diverse, flexible, vast field where I could potentially identify an area

that would give me joy most of the days. I was fortunate—I did.

How did you hear about IRIYA program, and what led you to apply?

F.V.: I read about IRIYA on RSNA's website, and I was told about this possibility by my academic mentor at the University Hospital of Palermo, Prof Giuseppe Brancatelli. I have always loved to research since I was a medical student, and I published my first paper as a coauthor at the age of 20. After collaborating in some scientific research projects during the first years of radiology training, I realized I had an important gap in knowledge regarding the adequate methodology on how to conduct an excellent research project, including a solid study design, statistics, literature evaluation, manuscript preparation, and presentation of study results. I knew I needed mentors [who] could provide me [with] a solid basis to pursue my genuine interest in research, and this is why I decided to apply.

M.A.: I read the call for application to the 2017 program in one of the RSNA newsletters; I had just completed my fellowship at the Royal Brompton Hospital in London at the time. Having read the description, I thought it seemed perfectly tailored for my stage of career and for my wish to continue academic work.

Describe your experience participating in the IRIYA.

F.V.: IRIYA was a full-immersion research experience with world-renowned mentors in academic radiology and very motivated international trainees. It was a perfect balance of a well-structured research program with highly relevant lectures, very active and entertaining panel discussions, and a joyful environment with young colleagues sharing the same interest, excitement, and satisfaction in performing research. We were all there from different coun-

tries around the world to learn about research, and we had the privilege and honor of meeting great, skilled, experienced, and brilliant clinical radiology researchers and mentors. Lectures covered multiple topics concerning research, ranging from study methodology to manuscript preparation, but also included inspirational presentations on how to approach the academic world. We also had the unique opportunity to present our current research project to a panel of experts at a research workshop and to receive feedback from the experts.

Finally, all the IRIYA and ITAR [Introduction to Academic Radiology] trainees were divided into six groups, and each group was tasked to use the gained knowledge to create a new research project in a few hours. We had to apply all the tips and tricks on study design learned during the course, and it turned out to be a very exciting competition.

M.A.: I was thrilled to be selected. The staff was very welcoming and friendly. The schedule was intense, and the topics ranged from statistics to philosophy. I enjoyed every presentation, the practical activities, as well as the dedicated hours to attend the congress. Each of us had some homework to do before going to Chicago: to prepare a project and to present it during the week. Also, at the end of the program, together with the ITAR seminar members, we did a rather entertaining exercise of developing an imaginary project by using the gained knowledge from the program and presenting it to the rest of the participants. Our group was undoubtedly creative: we pursued a hypothetical multicenter international trial to assess coffee's impact on radiologists' productivity.

What did you learn? How did this help shape your career? What do you see as the benefits of participating?

F.V.: The IRIYA program went beyond my expectations providing not only a solid basis for my future career in academic radiology in terms of theoretical knowledge, but more importantly it facilitated the development of valuable long-lasting friendships with international colleagues sharing an interest in research. Thanks to the IRIYA program, we were able to create a very supportive, curious, and inspiring group of international radiology friends, and we still maintain a stimulating virtual environment [where we] provide suggestions and support in our everyday practice. As a result, we collected our forces, and each of us used her/his connection with international societies for a joint research project on the involvement of radiology trainees in academics at an international level, which turned

into several research presentations [at] national and international conferences worldwide and [as a] scientific publication in *Insights into Imaging* titled "Gender Discrepancy in Research Activities during Radiology Residency" (20).

M.A.: Although I did learn a lot of valuable practical things such as presentation styles, methods of statistical analyses, and manuscript writing, the most remarkable sessions involved different academic pathways and one about calling by Professor Richard B. Gunderman. Often in medical and radiology education, we stick to exact values and algorithms, leaving the humanities and creativity aside. Many of the speakers are role models in their daily work, I am sure, and they were so for me during that week and since. Last but not least, I met wonderful colleagues among the participants—we shared ideas, had fun after the sessions, have kept in touch since, and have formed our active international network.

How has your career grown since participating? Do you feel the IRIYA program played a part in your success?

F.V.: After the IRIYA program, I completed a 1-year research fellowship at Duke University, I became a board-certified radiologist in Italy, and I started a PhD program at both [the] University of Palermo in Italy and University of Paris in France. I have also published many papers in international prestigious radiology journals, including *Radiology*, and I was awarded the fellow research prize in abdominal imaging from [the] RSNA [Annual Meeting] in 2019 and the Albert L. Baert Editorial Fellowship by the European Radiology Private Foundation in 2020. IRIYA has undoubtedly provided me inspiration and knowledge to pursue my interest in research, and some of the IRIYA friends still offer me continuous support to keep going on, even when difficulties in the academic world turn me down.

M.A.: I have been interested in research during training; I think basic and translational research give us critical tools to understand diseases and potential targets for therapeutic interventions. Weeks before going to Chicago that year, I applied to a program for doctoral studies and was accepted. IRIYA turned out to be an intense motivating introduction to my PhD [program]. I would say, my postgraduate studies are running well—for instance, I have recently been awarded the fellow research prize in cardiac imaging from RSNA. [My] PhD experience has also been crucial for me to further foster daily creative academic thinking.

Additionally, I have applied the knowledge I got about the educational pathway to my new

Education Materials Recipients

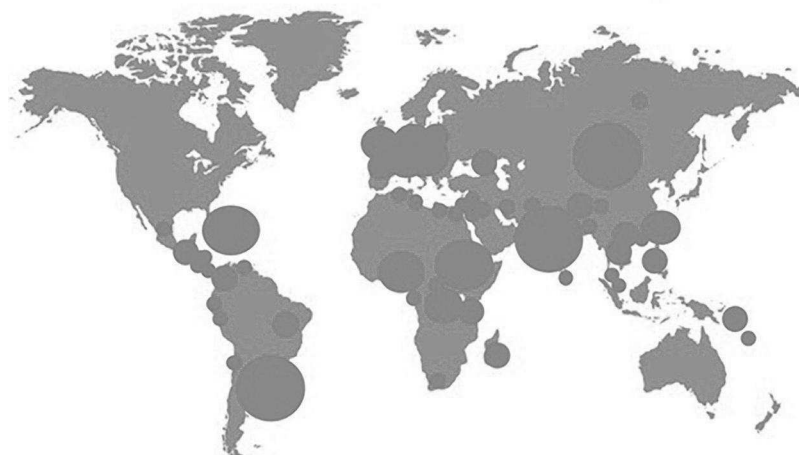


Figure 7. Map shows the distribution of EMJA recipients and their countries of origin, from 2001 to 2019.

role as the specialty training lead in my hospital, and we have [received] excellent results since, with a significant increase of trainees' interest in cardiothoracic imaging as a subspecialty.

Indeed, our IRIYA group's networking has been essential, too. Aside from supporting each other in [the] ups and downs of academic lives, in 2019 we [also ran] a large international survey about academic involvement of radiology trainees, presented the results at many conferences in several continents (including RSNA 2019) with several awards, published a paper (20), and have other manuscripts in the pipeline together.

What would you describe as the most significant professional challenge you face today? What is the biggest reward?

F.V.: I am particularly proud not only to have obtained the National Scientific Habilitation (ASN) for Associate Professorship in Radiology at the age of 31 in Italy but, more importantly, to have inspired other young radiology trainees to perform research projects and to see their success. Indeed, 11 radiology residents that worked with me on different research projects obtained the Invest in the Youth award for the European Congress of Radiology 2020. The biggest professional challenge I face today is related to the uncertainty of my academic pathway and the need to reach a work-life balance. Indeed, while there are plenty of full-term job opportunities as a radiologist in nonacademic hospitals, there is a current lack of opportunities for research positions in Italy, which does not allow me to make mid- or long-term plans.

M.A.: As for many radiologists today, my most significant professional challenge is the lack of

time and, I would add, the lack of research incentives in the specialty. I think the two factors are the risk of burnout for many academically oriented radiologists worldwide. However, the rewards do compensate not infrequently; my educational role lets me see that spark in someone's eyes when they discover the beauty of cardiothoracic imaging, of academic activities, or—even better—a combination of both. Seeing the fruits of the experimental research with high translatability, with a potential to contribute to health care and people's health, is priceless [and] is every medical scientist's dream, I think, and I am grateful to be part of this.

Education Materials and Journal Award Program

Through the EMJA program, the RSNA has provided much-needed up-to-date information and peer-reviewed articles to radiology academic programs globally. Since 2001, this program has supported 60 countries, with a cumulative total of 515 years of subscriptions to the RSNA journals (Fig 7, Table 5).

Societies, medical libraries, and radiology teaching institutions in resource-limited nations are eligible to apply to receive a 1-year free online subscription to *Radiology* and *RadioGraphics*. Additionally, radiology teaching institutions in resource-limited nations may apply to receive educational digital media available through the RSNA Education Center that support their teaching programs. More information is available on the RSNA website (21).

Newest CIRE Program: Global Learning Centers

All of the programs CIRE has developed have grown in scope and width to encompass the

Table 5: EMJA Awards by Country from 2001 to 2020

Country	Number of Times Awarded to Each Country
India	47
Argentina	37
China	36
Ethiopia	26
Cuba	24
Nigeria	22
Croatia	16
Albania, Slovakia, Taiwan	15
Hungary, Pakistan	13
Poland	12
Armenia, Bulgaria, Egypt, Nepal	11
Madagascar, Romania, Uganda	10
Brazil	9
Cambodia, Colombia, Ukraine	8
Lithuania, Solomon Islands, Vietnam	7
Guatemala, Palestine	6
Bhutan, Czech Republic, Kenya, Philippines	5
Malaysia, Mexico, Nicaragua, Russia, Tunisia	4
Myanmar (formerly Burma), Costa Rica, Ecuador, Fiji, Peru, Singapore, Sri Lanka, Venezuela, Syria	3
Bangladesh, Cameroon, Chile, Hong Kong, Rwanda	2
Algeria, Belarus, El Salvador, Iran, Jordan, Libya, South Africa	1

needs of radiologists from around the globe. These needs have evolved, and so must our ways to address them. The current status of globalization provides us with more technological tools to embrace and incorporate into our methods of teaching and learning. There is no doubt that the programs described here have been successful, and the experience acquired with them over a quarter of a century allows CIRE to dream of more ambitious goals.

In 2018, the RSNA Board of Directors summoned the CIRE to look for means to achieve stronger academic bonds with international educational institutions, to leave a durable imprint of collaboration, and to work for a perdurable effect. In 2018–2019, the committee, led by then Chair, Kristen DeStigter, MD,

University of Vermont, met and discussed various approaches to provide support to academic teams in terms of educational and research purposes. From those discussions, the GLC concept was born and developed. The RSNA Board of Directors, after thorough analysis and input, supported the idea and provided funding. The program has been structured to start in the 2020–2021 academic year.

The GLC program aims to connect a radiology institution with a team of RSNA members for an educational program to improve departmental skills and competency. Using a combination of in-person lectures and online or remote learning experiences, the RSNA team will create a customized educational plan based on the needs of the center. This includes a 3-year work plan between the RSNA and the local host institution. Throughout this 3-year commitment, the RSNA team will also be able to offer technological and equipment support, if warranted. Also, one junior faculty will be a part of the DHN International Fellowship program during the 2nd year.

RSNA members can volunteer to participate. RSNA team members (up to five) should consider traveling up to twice yearly to the GLC to understand the educational needs of the host site, present lectures, and provide hands-on training and point-of-care opportunities. One member of this group will be named RSNA Program Director by CIRE, on approval of the RSNA Board of Directors. This team will design the customized educational plan, together with the GLC, using RSNA educational resources. The Program Directors (host and RSNA) will serve a 3-year term, and the remaining RSNA members will have a 1-year (renewable) term (more information is available on the RSNA website) (22).

The GLC program will be the continuation of the IVP program. Therefore, the latter will be retired at the start of the first GLC program. New GLC will be added during the following years, and there are plans to keep three centers in operation at any time in the future.

The first GLC will be at Stellenbosch University, Stellenbosch, South Africa, and Richard Pitcher, MBChB, PhD, will serve as the GLC Program Director (23) (Fig 8). The RSNA team is led by Mark Cresswell, MD, MBBCh (St Paul's Hospital, Vancouver, British Columbia, Canada), together with Prachi P. Agarwal, MD (University of Michigan Health System, Ann Arbor, Mich), Omer A. Awan, MD (University of Maryland Medical Center, Baltimore, Md), and Brian F. Mullan, MD (University of Iowa Hospitals and Clinics, Iowa City, Iowa). The RSNA team will focus on the needs declared by the host institution,



Figure 8. Dr Mark Creswell (left) is GLC RSNA Program Director, and Dr Richard Pitcher (right) is GLC Program Director.

who selected cardiothoracic and musculoskeletal radiology as their primary focus. All the curriculum planned has been thought out and designed in cooperation with staff at Stellenbosch University and is expected to provide a substantial impact on academic output, diagnostic capability, and workflow optimization. For this article, Drs Pitcher and Creswell each shared their thoughts on the inception of the first GLC (e-mail, April 2020).

It is certainly an enormous honor and privilege for Stellenbosch University to have been nominated as the inaugural RSNA Global Learning Center. We very much look forward to this opportunity for collaboration, which heralds a new era for our department. To date, we have had very fruitful online planning meetings with the RSNA team of Drs Mark Cresswell, Prachi Agarwal, Omer Awan and Brian Mullan, with the sustained support of Coura Badiane. We could not have wished for a more committed team or more inspired leadership on the part of Dr Cresswell. We are delighted that the focus of the GLC initiatives will be musculoskeletal and cardiothoracic imaging. At Stellenbosch University, we strive to seamlessly integrate clinical service, teaching, research, and departmental management. The teaching and mentorship of the RSNA GLC will thus play out in every aspect of our departmental activities. Patient care will potentially be enhanced on multiple levels through new and improved imaging protocols, increased accuracy of radiological reporting, more substantive radiologist contributions to multidisciplinary clinical meeting, and improved patient outcomes.

—Dr Richard Pitcher, GLC Program Director

With the inception of the first RSNA GLC, which has evolved out of the previous IVP program, we have been asked by the RSNA

Board to reimagine how radiology global outreach can be conducted to have maximal sustained impact, empowering radiologists to feel confident in their craft, and build capacity to ensure future generations of radiologists will be hailing from around the world. Each new GLC will be supported over a 3-year term, with the process being very much a two-way discussion between the RSNA team and our hosts—working together, harnessing the tremendous educational capacity and expertise of the RSNA and the different facets of the CIRE committees to build regional teaching programs that can mature to meet the imaging needs of their respective communities. As both the RSNA and host GLC teams forge a way forward together, we have been very fortunate in the inaugural program to be working with Stellenbosch University, under the leadership of Prof Pitcher, which has a mature residency program that is looking to deepen their subspecialty educational capacity and meet the needs of their referring specialists. The lessons learned will enable the GLC program to take on increasingly challenging projects around the world. We are excited, daunted, and learning to be very flexible in our rapidly changing world. The silver lining of the dark COVID[-19] cloud will be to challenge us to do more online teaching and communication, enabling the previous IVP model to truly transform into an ongoing supportive and collaborative GLC program. We are very grateful for the brave vision of the RSNA board, the CIRE committee under the leadership of Prof Claudio Silva, and all those RSNA members and vendors whose donations have made this possible.

—Dr Mark Cresswell, GLC RSNA Program Director

Owing to the COVID-19 outbreak that started in December 2019, its pandemic spread

All CIRE Programs

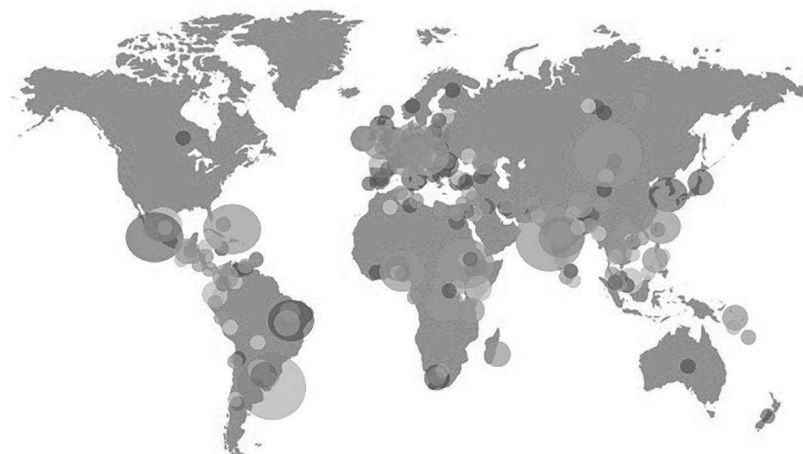


Figure 9. Map shows the coverage of all CIRE programs since the inaugural IVP program in 1986 to 2019. Orange circles = EMJA program, purple circles = DHN fellowship, red circles = IRIYA program, yellow circles = IVP program.

Table 6: Current CIRE Members and Their Country of Origin as of April 2020

CIRE Member (Role)	Country of Origin
Claudio Silva, MD, MSc (Chair)	Chile
Omolola M. Atalabi, MBBS	Nigeria
Guillermo Elizondo-Riojas, MD, PhD	Mexico
Ernst Garçon, MD	United States
Nitin P. Ghonge, MD	India
Judy W. Gichoya, MBChB, MS	United States
Sarwat Hussain, MD	United States
Musturay Karcaaltincaba	Turkey
James M. Kofler Jr, PhD	United States
Jeffrey B. Mendel, MD	United States
Giovanni Morana, MD	Italy
Sergey Morozov, MD, MPH	Russian Federation
Mini V. Pakkal, MBBS	Canada
Jean-Pierre Tasu, MD, PhD	France
Thazin Than, MBBS, PhD	Myanmar
Carlo Catalano, MD (ESR Representative)	Italy
Umar Mahmood, MD, PhD (Board Liaison for International Affairs)	United States

since March 2020, and the resultant travel restrictions, the in-person portion of the program will be postponed to 2021. During 2020, most work has been performed remotely to complete all adjustments necessary for a successful deployment.

Conclusion

For 25 years, the RSNA has had a structured and stable approach to international outreach, specifically in education and research through CIRE (Fig 9). However, CIRE is not the only initiative that considers international members. RSNA Spotlight Courses are taking place in different countries across continents, with ever-growing attendance numbers from those who need to refresh and learn specific topics. Also, the International Advisory Committee has a role providing advice to the RSNA Board of Directors in activities during the Annual Meeting (such as international trends) and outside, specifically regarding their impact on international radiologists. The Research and Education Fund provides grants to international applicants who have successfully been awarded and their results presented at the RSNA Annual Meeting and subspecialty meetings. Finally, it has close relationships with other radiologic societies such as the European Society of Radiology, Colegio Interamericano de Radiología, and Asian Oceanian Society of Radiology, among others.

The members of CIRE (Table 6) will continue to assist international radiology academics, to bond and thrive, to meet and work, to learn and teach. In this constant evolution, we find the means to perfect the way we, as radiologists, work together to have a global academic community that can continue to consolidate our specialty as the strongest pillar of modern medicine.

Acknowledgments.—A warm heartfelt appreciation is in place for every member and past member of this committee since its beginning, and also to all the RSNA staff who have worked with the committee and with CIRE throughout the years. Work at CIRE would not be possible without their invaluable and hard efforts.

Disclosures of Conflicts of Interest.—**M.K.** *Activities related to the present article:* disclosed no relevant relationships. *Activities not related to the present article:* payment for lectures from Bayer, GE Healthcare, and Pfizer. *Other activities:* disclosed no relevant relationships. **G.M.** *Activities related to the present article:* disclosed no relevant relationships. *Activities not related to the present article:* payment for lectures from Bracco. *Other activities:* disclosed no relevant relationships.

References

1. Radiological Society of North America. Board of Directors Meeting Minutes: February 1982. Oak Brook, Ill: Radiological Society of North America, 1982.
2. Radiological Society of North America. Board of Directors Meeting Minutes: November 1982. Oak Brook, Ill: Radiological Society of North America, 1982.
3. Radiological Society of North America. Board of Directors Meeting Minutes: September 1984. Oak Brook, Ill: Radiological Society of North America, 1984.
4. Stevenson GW, Zylak CW, Peter Cockshott, MD. Radiology 1994;190(3):908.
5. Radiological Society of North America. Board of Directors Meeting Minutes: November 1984. Oak Brook, Ill: Radiological Society of North America, 1984.
6. Radiological Society of North America. Board of Directors Meeting Minutes: September 1985. Oak Brook, Ill: Radiological Society of North America, 1985.
7. Radiological Society of North America. Board of Directors Meeting Minutes: November 1987. Oak Brook, Ill: Radiological Society of North America, 1987.
8. Radiological Society of North America. Board of Directors Meeting Minutes: February 1996. Oak Brook, Ill: Radiological Society of North America, 1996.
9. Radiological Society of North America. Committee on International Radiology Education (CIRE). <https://www2.rsna.org/timssnet/About/committee.cfm?c=C0001595>. Published 2019. Accessed March 1, 2020.
10. Cockshott WP. RSNA International Visiting Professor. Radiology 1988;166(3):900.
11. Radiological Society of North America. International Visiting Professor Program. <https://ektron.rsna.org/IVP/>. Published 2018. Updated 2019. Accessed March 1, 2020.
12. Cobb RJ. Another RSNA Malaysian journey. Radiology 1995;196(1):47A–49A.
13. Cope R. Radiology in Ecuador: an RSNA visiting professor in Quito—Radiological Society of North America. Radiology 2001;219(3):594–595.
14. Gerscovich EO. My experience as an RSNA international visiting professor to Monterrey, Mexico. Radiology 1995;194(2):41A–44A.
15. Skucas J. Radiology in Lithuania: impressions of a visiting professor. AJR Am J Roentgenol 1995;165(1):39–42.
16. Ferris EJ, Fraser DB. Tribute to Derek C. Harwood-Nash, MD, DSc. Radiology 1996;201(3):593.
17. Petasnick JP, Ferris EJ, Osborn AG. The RSNA Derek Harwood-Nash R&E Fund International Fellowship. Radiology 1997;203(3):630.
18. Radiological Society of North America. Derek Harwood-Nash International Fellowship. <https://www.rsna.org/en/education/educator-resources/derek-harwood-nash-international-fellowship>. Published 2020. Accessed March 1, 2020.
19. Radiological Society of North America. Introduction to Research for International Young Academics. <https://www.rsna.org/education/workshops/introduction-research-international-young-academics>. Published 2020. Accessed March 1, 2020.
20. Vernuccio F, Arzanauskaite M, Turk S, et al. Gender discrepancy in research activities during radiology residency. Insights Imaging 2019;10(1):125.
21. Radiological Society of North America. Education Materials and Journal Award Program. <https://www.rsna.org/en/journals/subscriptions/low-resource-country-award-program/emja-application>. Published 2020. Accessed March 21, 2020.
22. Radiological Society of North America. Global Learning Centers. <https://www.rsna.org/education/Global-Learning-Centers>. Published 2020. Accessed March 1, 2020.
23. Radiological Society of North America. RSNA Announces the First Global Learning Center. <https://www.rsna.org/en/news/2019/November-December/First-GLC-Announcement>. Published December 6, 2019. Accessed March 1, 2020.