

International skeletal society outreach in Colombia

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The Colombian ISS outreach program was conducted in collaboration with the Department of Diagnostic Imaging of the University Hospital of San Ignacio at the Pontificia Universidad Javeriana (PUJ) in Bogota and as a part of the XXXV Congress of the Colombian Radiological Association (ACR) in Cartagena from August 3 to 6, 2010. Both meetings were enthusiastically attended with an average of 140 participants per day. Members of the ISS outreach team included Dr. Javier Beltran from Brooklyn, NY, Dr. Diego Jaramillo from Philadelphia, PA, and Jenny T. Bencardino from New York, NY. All lectures were given in Spanish.

The program in Bogota was held at the Carlos Galan Auditorium of the PUJ from August 3 to 4, 2010. Bogota is the capital city of Colombia and has a population of over 8 million people. Currently, there are more than 100 higher education institutes and ten medical schools in Bogota, which play a vital role in the life of the city and its economy. In 2007, Bogota was named a World Book Capital City by UNESCO [1]. Bogota is the first Latin American city to

receive this recognition, and the second one in the Americas after Montreal. No wonder that many refer to Colombia's capital as "The Athens of South America" [2]. The attendees to the outreach program in Bogota were radiologists, orthopedic surgeons, technologists, residents, and fellows in radiology and orthopedics. The audience was very engaged, and the use of a digital interactive response system added greatly to their learning experience.

The Outreach program in Cartagena was held at the Julio Cesar Turbay Ayala Convention Center, from August 5 to 6. Cartagena is a city of almost 1 million people located on the Colombian Caribbean coast. Its colonial walled city and fortresses have been designated a UNESCO World Heritage Site. Gabriel Garcia Marquez's novel *Love in the Time of Cholera* is set in Cartagena. The city is very often used as a gathering place for international and national conventions. The 2010 ACR annual meeting in Cartagena had an attendance of 800 radiologists both local and from other Latin American countries. The musculoskeletal program lasted 2 days. The topics of the Outreach Program in Colombia were both basic and advanced in the areas of general and pediatric musculoskeletal radiology with an average of eight lectures per faculty member. All of the ISS Outreach Program teachers participated as jurors of the Evaluating Committee scoring scientific papers and educational exhibits presented at the ACR meeting in Cartagena. The Colombian outreach program provided us with a unique opportunity to interact academically and share professional experiences with a large body of radiologists from Colombia and other Latin American countries. Some of the information presented in this report was collected informally during our visit.

Located in northern South America, Colombia is bordered to the north by the Caribbean Sea between Panama and Venezuela, to the east by Venezuela and

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Brazil, to the south by Ecuador and Peru, and to the west by the North Pacific Ocean between Panama and Ecuador. The area of Colombia is slightly less than twice the size of Texas. The country is populated by 45 million people living predominantly in urban areas (74%) [3]. The national language is Spanish. Colombia distinguishes itself as a country where foreigners have traditionally been welcomed. The country lies at the crossroads between the Americas, and as such has been shaped by a broad biological and cultural diversity. Native American, European, African, Caribbean, and Middle Eastern influences are all present in Colombia's modern life.

The Ministry of Social Protection is the national executive body responsible for coordinating and implementing national policy and services relating to health and social security. The life expectancy at birth is 70 years for males and 77 year for females [3]. In regards to the health workforce, there is a ratio of 13 physicians per 10,000 persons, which is below the average for the WHO Region of the Americas (22.9 per 10000) [3]. The government sponsors 83.9% of the expenditure on health [4]. The remaining portion is private, half of which is through private insurance and the other half as private out-of-pocket expenditure. The total expenditure on health in Colombia is 5.9% of gross domestic product (GDP) [4]. The total expenditure per capita is only US\$317, well below the US \$3,000 average for the region. Injuries (44%) are the most common cause of years of life lost in Colombia. During the last decade, Colombia's health reform increased access to health services to its poorest populations [5]. Though the

Table 1 Urban–rural distribution of radiology professionals in Colombia

Areas	Total radiologists	Urban practice	Rural practice
Bogota	448	411	37
Medellin	189	157	32
Valle - Cauca	132	113	19
Coffee Axis	99	71	28
Barranquilla	86	86	0
Bucaramanga	37	34	3
Cartagena	37	37	0
Cucuta	23	22	1
Sucre y Cordoba	24	0	24
Nariño	14	11	3
Boyaca	15	7	8
Santa Marta	10	0	10
Valledupar	6	0	6
Total	1,120	949	171
	100%	85%	15%

Table 2 Distribution of Colombian radiology professionals in different practice types

	University hospitals	Other hospitals and health centers	Private offices	Total
Number	194	428	498	1120
Percentage	17%	38%	44%	100%

reimbursement figures for radiology services have not changed in the past 10 years, the volume of imaging studies has increased, primarily due to the current tendency by the Colombian population to seek health care through emergency rooms. This boom in radiology services has resulted in a 50% increase in radiology equipment expenditures in the last year. In general, private facilities have access to more advanced imaging equipment than the government-sponsored ones, but there is widespread availability of all cross-sectional imaging modalities.

Colombia pioneered the use of new medical technology at the turn of the 20th century in South America. The medical use of X-rays in Colombia dates back to 1901, where it was first utilized for operative procedures. The Colombian Radiological Association (ACR) was founded in 1945 and held its first national meeting in 1950 [6]. The Department of Radiology at the Hospital San Ignacio of the PUJ, the first stop on our visit, was founded in 1960 and has since graduated more than 100 radiologists. There are 1120 radiologists registered with the ACR, 85% of them in urban areas (Table 1). Radiologists working in urban Bogota alone account for 39% of the workforce across the nation. Actual location, however, is not a limitation in terms of geographic coverage since at the present time, the practice of teleradiology in Colombia is enjoying a great moment, providing interpretative services all across the national territory and neighboring countries. The ACR has a national radius of action with 680 affiliated radiologists encompassed by 11 regional associations, which in turn cover 27 of the 32 departments of the country. Each association is composed of at least 10 member radiologists. In most cases, Colombian radiologists practice in a multi-modality environment with the exception of those affiliated with large university hospitals (17%), where there is a

Table 3 Distribution of radiology equipment throughout Colombia

	MRI	CT
Bogota	33	78
Medellin	16	38
Cali	10	26
Bucaramanga	8	28
Barranquilla	6	17
Other	32	134
Total	105	321

tendency to perform in a subspecialty format (Table 2). Interestingly, in two large academic centers, radiologists are financially sponsored by their institutions to enroll and travel abroad for subspecialty training.

There are 14 programs of residency training in radiology across the country yielding 38 radiologists per year. The language of instruction is Spanish. The residency training lasts 4 years and requires the graduates to take and pass both written and oral examinations, which are administered by the accredited programs. In addition, residents take in-service written and oral exams are given yearly by the training institutions. Residents who fail to pass the in-service exams in two consecutive years may be asked to leave the program. A formal obligatory recertification program is not yet in place. However, in 2001, the ACR implemented a voluntary process of recertification for its 680 affiliated radiologists comprising an annual examination as well as a requirement that 200 CME credits be accumulated over a period of 5 years.

There are only two fellowship training programs available within the country in the subspecialty areas of neuroradiology and interventional radiology. A significant number of Colombian residents apply for fellowship positions abroad. The most sought after subspecialty programs are neuroradiology, interventional neuroradiology, body imaging, and musculoskeletal radiology.

Despite the exposure of Colombian radiologists to new imaging modalities through American and European journals and books, the practical application of advances in diagnostic imaging has somewhat lagged behind primarily due to economic constraints. The first CT, ultrasound, and MR units were installed in Bogota in 1978, 1979, and 1990, respectively. To date, there are 321 CT units and 105 MR scanners in the country with approximately 60–70% of the equipment located in the five major urban centers (Table 3). Currently, the Department of Radiology at the University Hospital of San Ignacio performs approximately 112,965 imaging studies annually. The most used advanced imaging modalities are ultrasound with 17,058, CT with 11,907, MRI with 3,883, and nuclear medicine with 2,117 studies per year. However, as in other parts of the developing world, a large percentage of all imaging procedures are still essentially conventional radiography [7].

Our visit to the University Hospital of San Ignacio and participation at the 2010 ACR annual meeting made it clear to us that the level of knowledge and information of Colombian radiologists is comparable to their counterparts

anywhere else in the world. As an interesting fact, Colombian radiologists were noted to be the second largest group of international medical graduates (IMG), after Indian radiologists, seeking accreditation by the American Board of Radiology (ABR) according to a presentation at the 2010 Society of Chairs of Academic Radiology Departments (SCARD) in Quebec City, Canada [8]. Furthermore, the importance of Latin American radiology was highlighted during last year's RSNA annual meeting. The RSNA 2010 attendees had the opportunity to learn about Latin American radiology research as well as clinical and educational activities during the session "Latin America Presents – A Journey through Latin-American Radiology: Past, Present and Future" [9].

We would like to conclude by borrowing the vision of the 2010 RSNA President Dr. Hedvig Hricak: "Latin America is vast, diverse and unique – the future of the region looks both exciting and challenging. Building on their significant historic and ongoing contributions to the field, Latin American radiologists are ensuring that regional growth translates into increasing investment in major public health issues, including training of healthcare professionals and implementation of cost-effective technologies."

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