
Abstract:

“Global health” has expanded a great deal in the past 10 to 15 years through expansion of training programs, implementation of best practices, funding and performance of clinical research, and in educational experiences for trainees. One aspect of health care, pediatric emergency medicine, has roots in many parts of the world; it is clear that there are many places where it is either not recognized as an important subspecialty and where the quality of care can be highly variable. Our article will describe how partnerships between institutions in the United States (Cincinnati Children's Hospital Medical Center) and Spain (Hospital Universitario de Cruces in Vizcaya) help in the development of pediatric emergency services as well as in the establishment of the subspecialty in Spain.

Keywords:

global health; pediatric emergency medicine; Spain; Europe

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Changing Clinical Practices and Education in Pediatric Emergency Medicine Through Global Health Partnerships

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Over the past decade, “global health” has become an important aspect of program development, not only in the area of education but also in research as well as clinical services. Many medical students and pediatric residents have experienced a rotation abroad to learn about health care systems in developing countries and to provide care to children in need of basic services. These interests and experiences have even sparked the development of “global health tracks” in residency and fellowship programs to attract and train



Figure 1. Hospital Universitario de Cruces, Vizcaya, Spain.

pediatricians and subspecialists with interest in making pediatric global health work as their career path. Other programs have focused their attention in the care of patients with specific problems (ie, malnutrition, acquired immunodeficiency syndrome, and malaria) and, at the same time, creating the infrastructure that will allow those countries to be able to maintain these services.¹

The evolution of health care and the systems developed to deliver it is another aspect of global health. Although pediatric emergency medicine (PEM) has roots in many parts of the world, it is clear that there are many places where it is not recognized as either an important subspecialty and/or a service where the quality of care can be highly variable. Many European health care systems have taken longer to embrace emergency medicine and, in particular, PEM. This article will describe how partnerships between institutions in the United States (Cincinnati Children's Hospital Medical Center [CCHMC]) and Spain (Hospital Universitario de Cruces in Vizcaya [HUCV], Spain) (Figure 1) help in the development of pediatric emergency services (PES) as well as the establishment of the subspecialty in Spain.

HISTORY OF THE PROCESS

Pediatric emergency services in Spain have experienced a continuous transformation over the

past 20 years. This is due, in part, to increased emergency department (ED) patient volumes² as well as more standardized training of providers in PEM. In 2004, there were nearly 23.7 million visits to EDs throughout different hospitals in Spain, a 45.4% increase over the past 10 years.³ Pediatric emergency services have also experienced similar growth. For example, the ED at HUCV has doubled the number of visits since 1995, reaching a total of 63 000 in 2010.

With the purpose of offering a more specialized and satisfactory experience in the pediatric ED, several teams were developed to work specifically within PEM, and plans were developed for expansion of units in different hospitals with a focus on pediatric care. The development of such teams has increased the demand for specialized training, knowledge, and technical skills in the field. In addition, the need for exchange of scientific and organizational knowledge has increased dramatically as the field continues to evolve. However, in Spain and in most European countries, there are no official programs for training in pediatric subspecialties, including PEM. There are no defined standards for training or the necessary skills for personnel working in EDs, nor were there requirements for the design and/or function of these units within the hospital system. For this reason, the development of training programs in PEM, as well as

modifications of pediatric EDs, has been driven by the initiative of certain institutions and through a group effort in the creation of the Spanish Society of Pediatric Emergency Medicine (SEUP).^{3,4}

In the United States, PEM was developed as a subspecialty within pediatrics and emergency medicine in the 1980s. Since that time, the numbers of PEM trainees and their influence on pediatric emergency care have been constantly growing.⁵ The first PEM certification examination was offered in November 1992. Training programs were then certified and accredited by the Accreditation Council for Graduate Medical Education (ACGME). Initially, PEM required 2 years of training after completion of a pediatrics or emergency medicine residency. This changed in 1995 when a 3-year program was required by the American Board of Pediatrics. At the same time, the process for recertification and maintenance of skills has been developed for PEM.

In the mid 1990s, several countries introduced PEM training and services, with official recognition by their health care accreditation agencies. As of today, there are 49 accredited pediatric pathway programs, 20 emergency medicine pathway programs in the United States. In 2005, there were 9 in Canada, 8 in Australia, and 10 in the United Kingdom in 2005.^{6,7}

During this time in Spain, some medical centers began to assign pediatricians and nurses with a strong interest to work only in the area of pediatric emergencies and began remodeling some EDs to

better accommodate the care of children. These changes were promoted by steady increases in pediatric patients seeking emergency services in the country. In March 1995, the PES of the HUCV organized a meeting with the leaders of 12 other PES throughout Spain. At this time, the group created the “Sociedad Española de Urgencias Pediátricas” (SEUP) (Figure 2) and began the process for the society's first scientific meeting in Bilbao in November, 1995. At this first meeting, there were 120 attendees, and 35 research projects were presented. Most of the attendees were pediatricians who worked predominantly in the ED. Two years later, the SEUP was recognized by the “Sociedad Española de Pediatría” (Spanish Pediatric Society), and like other pediatric subspecialties, it was recognized that specific training is required to work in this area.⁸ The SEUP meetings in Barcelona in 1996 and Málaga in 1997 together had more than 1000 participants with 400 scientific projects presented.

During the same period, in October 1998, physicians from Montevideo, Uruguay, were organizing their third PEM meeting (Jornadas de Emergencia Pediátrica). This meeting was organized by Dr Osvaldo Bello (PEM Section Chief) and the PEM division at the Hospital Pereira Rosell. The organizers brought teaching faculty from the United States, Europe, and South America, and it created the opportunity for HUCV and Children's Hospital Medical Center in Cincinnati to start a partnership.

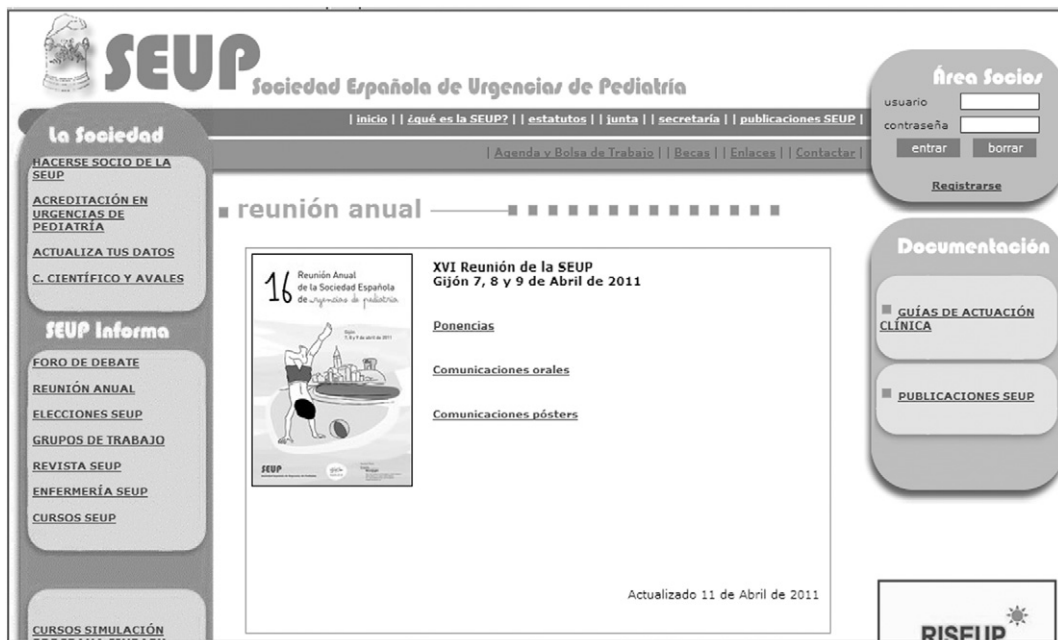


Figure 2. Sociedad Española de Urgencias de Pediatría “SEUP.”

TABLE 1. Residents from HUCV rotating at CCHMC and their field of training.

Year	Name—Pediatric Resident	Field—Goals for Rotation
2000	Dr Susana Capape	Analgesia and sedation
2001	Dr María Gonzalez	Operations—standardized processes of services
2002	Dr Ana Fernández	Triage
2005	Dr Itziar Iturralde	Approach to the critically ill child,
2006	Dr Eider Astobiza	Operations—standardized processes of services
2007	Dr Borja Gomez	Simulation training
2011	Dr Elisa Mojica	Patient safety

The exciting aspect of this partnership was the evolution from residents having a personal experience in international medicine to an experience with a curriculum designed to promote learning about PEM and requirements for subspecialty training program development for “export” to Spain. The scope of learning was not only related to physicians, but also to nursing, laboratory, radiology, and all other services associated with PEM. The first official rotation was in November, 2000. Since then, on a yearly basis, residents from HUCV have participated in this program (Table 1) with very specific goals, which included (but were not limited to) evaluation of curriculum, triage systems, procedural sedation, safety, quality improvement, and family presence during procedures. All these residents returned back to Spain, and supported by the PEM leadership at HUCV, implemented programs and developed processes that have had a tremendous impact in this field. A good number have stayed on as faculty at HUCV.

While the educational curriculum for resident rotations was being developed in Spain, the ninth SEUP meeting was organized in 2004. This scientific meeting invited participants from the United States, South America, Europe, and Israel to showcase PEM from the rest of the world in Spain. As a result, the International Pediatric Emergency Medicine Group was developed as a platform to organize activities to assist the development of PEM around the world. Additional hospitals in Spain begin to send their residents to rotate at CCHMC following the same curricular principles used in rotations done by HUCV residents. To improve program standardization and growth, PEM leadership at CCHMC and SEUP organized the educational needs and future

curricular contents for PEM in Spain. Some of these activities included the following:

1. Becoming international members of the American Academy of Pediatrics (AAP) and the AAP Section on Emergency Medicine.
2. Offering advanced pediatric life support courses (APLS) in Spain (2005) with foundation and approval for subsequent courses and certification throughout Europe.
3. Designing SEUP scientific meetings with a “theme” and competency skills development in mind:
 - a) Family, a new member of the PEM team, education and training in PEM (11th SEUP meeting, San Sebastian, 2007).
 - b) Quality improvement in PEM, patient safety (13th SEUP meeting, Zaragoza, 2009).
 - c) Team work, communication skills (15th SEUP meeting, Gijon, 2011).

As the educational, patient care skills, organizational, and administrative areas continued to be developed, a final key component followed: PEM research. This began with members of the PEM division at HUCV presenting at the Pediatric Academic Societies meeting in 2003. Both individual center projects and multicenter collaborative projects through the AAP Pediatric Emergency Medicine Collaborative Research Committee. In September 2007, under the leadership of Professor Hezi Waisman, the Section of Pediatric Emergency in the European Society of Emergency Medicine was created. The SEUP has been actively participating, with important contributions including the development of the European Network for Pediatric Research (REPEM) and the editing of the “European Syllabus in Paediatric Emergency Medicine” as the core curriculum for European training in PEM.

IMPACT OF PARTNERSHIP WITH THE PEM SERVICE AT HUCV

The partnership between HUCV and CCHMC has been a catalyst to speed the transformation of PEM in HUCV and Spain over the past 15 years. Some of these changes include the following:

1. Staff competencies—competency training of PEM personnel in specific areas and skills related to the PEM field (triage, procedural sedation, trauma, splinting, wound management, etc).
2. Evidence-based treatment protocols—developed and applied across clinical conditions similar to those used at CCHMC.

3. Operations—standardized processes for services (implementation of operations to improve ED patient flow, use of a standardized, team-based approach to the critically ill child, improvement in design of shift work, and matching of staffing patterns to ED patient volumes).
4. Improvement science—implementation of quality improvement processes and quality controls with official certification with International Organization for Standardization (ISO) 9001:2000 Rule in May, 2004.
5. Simulation training—added for maintenance of skills for PEM staff.
6. APLS and Pediatric Emergency for the Prehospital Provider courses—added locally, regionally, and nationally.
7. Residency training:
 - a) Development of a training curriculum in PEM with an evaluation process that incorporates acquisition and proficiency in specific competencies (ACGME model).
 - b) Implementation of simulation in the training of residents.
 - c) PEM additional training program—specific training for pediatric residents from HUCV or other institutions through a fourth year of PEM. Currently, HUCV PEM trains 4 residents per year in this field.
8. Research outcomes include the following:
 - a) Increase in number of scientific work presented at national and international meetings.
 - b) Increase in number of manuscripts published in international and high-impact journals (Figure 3).
 - c) Participation in the European Network for PEM Research (REPEM) and the recently

created International Pediatric Emergency Research Network,⁹ leadership in the Spanish Research Network in PEM (RiSEUP-SPERG, <http://www.riseup.sperg.es/>).

All these changes, improvements, and new developments are the result of a team effort by the staff of the PEM division at HUCV and the influence and partnership of the PEM division at CCHMC for over a decade. The transformation experienced in the PEM division at HUCV has not only changed the way PEM services are provided in this region, it has served as a model for the expansion throughout Spain (www.urgenciaspediatria.hospitalcruces.com).

IMPACT: WHERE ARE WE NOW?

The current state of PEM in Spain, like most other European countries, is still variable.¹⁰ Although some institutions are very advanced and embrace the concept of PEM as a subspecialty in pediatrics, others are not. In spite of these regional differences, SEUP continues to be the most important scientific society for PEM in Europe with more than 400 members (www.seup.org). It continues to be a model subspecialty society with several strong interest groups, significant commitment to educational program development, and pockets of strong research leadership. Some of the most significant contributions in past few years include the following:

- 1) Dedicated PEM workforce—increase in the number of hospitals with staff dedicated solely for the provision of PES.
- 2) Expansion of PEM training programs (Figure 4):
 - a) Sant Joan de Deu, Barcelona.
 - b) Hospital Niño Jesús, Madrid.
 - c) Hospital Son Espases, Palma de Mallorca.

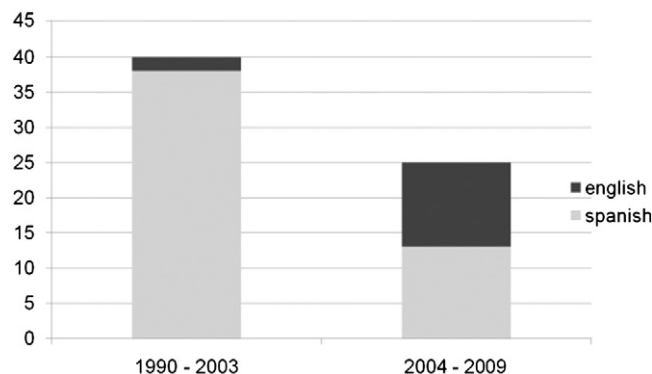


Figure 3. Hospital Universitario de Cruces in Vizcaya's research productivity represented by the number of publications and language published.

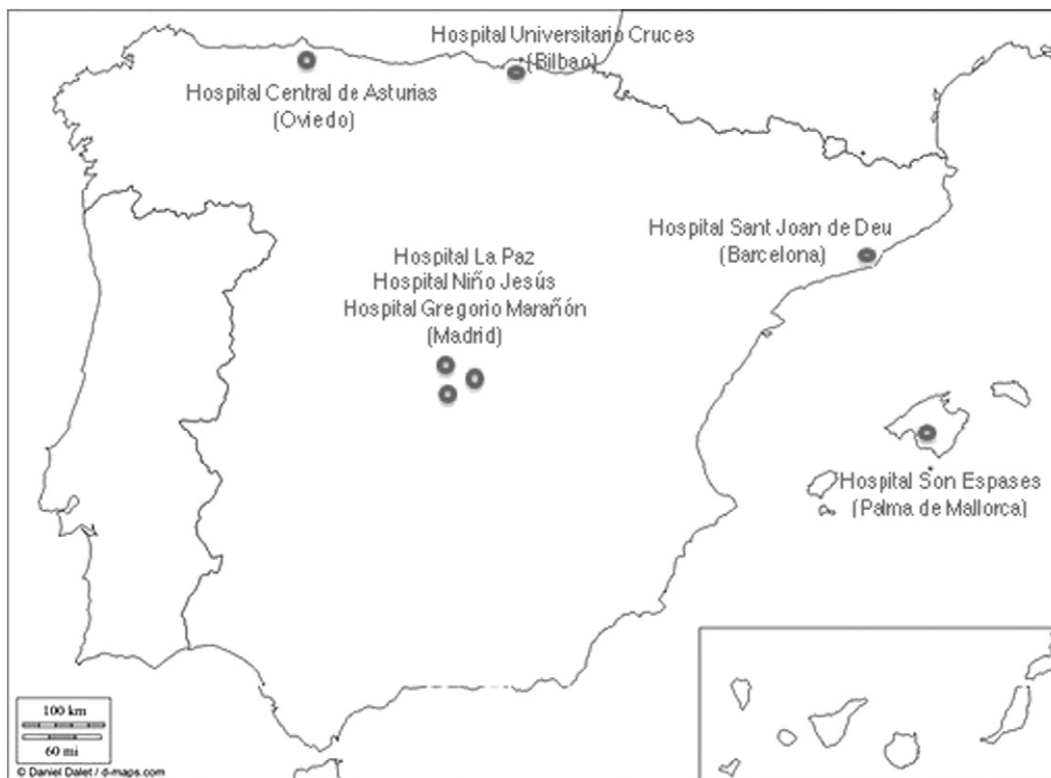


Figure 4. Locations of PEM services and training sites in Spain.

- d) Hospital Central de Asturias, Oviedo.
 - e) Hospital Gregorio Marañón, Madrid.
 - f) Hospital La Paz, Madrid.
- 3) Longstanding high-quality scientific meeting—over a decade of success of the annual scientific meeting with more than 500 participants per year and 300 submissions for abstract, platform, and workshop presentations.
 - 4) Spread of APLS certification—courses given annually in Bilbao, Barcelona, Valencia, and Madrid.
 - 5) The Spanish network for research in PEM (RiSEUP-SPERG).
 - 6) Active SEUP interest groups in residency training, research, advocacy, and competency development. The advocacy group works to advance the specialty within the Spanish Pediatric Medical Society.

The SEUP Task Force on Quality Improvement recently surveyed Spanish hospitals on their compliance with PEM standards in the ED. The results from 39 institutions uncovered serious organizational and structural problems in the delivery of PEM. The survey uncovered a “lack of interest” from


staff about how to implement necessary changes. Building support from health authorities, hospital administrators, and regional politicians requires a moderate amount of work to facilitate change and reforms in pediatric care. We believe that the use of the Model for Improvement¹¹ as supported by the Institute for Healthcare Improvement and institutions such as CCHMC may be critical in our currently resourced environment.

PEDIATRIC EMERGENCY MEDICINE IN EUROPE

The growth of PEM in Europe has been significant. Although not yet recognized as a medical subspecialty in Italy, France, and Spain, increased numbers of pediatricians are committed to the field.¹ In 2003, PEM was recognized as a medical subspecialty in the United Kingdom.¹² In a recent survey in which 53 tertiary care centers throughout Europe participated, authors concluded that there were vast differences among services providing pediatric emergency care in Europe as well as a deficiency in PEM-trained personnel.¹³ A group of pediatricians who work in PEM settings involved with the European Society for Emergency Medicine (EuSEM) and the European Academy of Pediatrics is

advocating for the development of PEM in Europe. This group developed the document “The European Syllabus of Pediatric Emergency Medicine,” which contains the curricular requirements for PEM training in Europe and presented it at the EuSEM and European Academy of Pediatrics, with approval likely to occur soon. Leadership from SEUP has been key, and the team has leadership from Israel's PEM establishment, who helped drive this endeavor forward through EuSEM and REPEM, using many aspects of work from the United States.

SUMMARY

Our goal was to articulate how global health, with its many definitions, is also meant to help spread advanced health care systems not only to the classic underdeveloped nation but also to the industrialized world where health care has evolved at different speeds in different countries. Not surprisingly, our system had, at its start, the exchange of students, residents, and faculty to explore differences in health care systems and used those opportunities to kick start the change process. Although these experiences are necessary and should be part of the formation of future generations of pediatricians providing emergency services, we believe that the scope should be broadened to include a bidirectional exchange of experiences that benefit children accessing emergency services and the promotion and incorporation of evidence-based practices. International collaboration and exchange, in this particular case, of organizational models, educational curricula, and professional development can and has made significant sustainable contributions in the development of PEM and the improvement of the quality of care provided in EDs caring for children in Spain. 

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