

National Conference of Emergency Medical Technicians 2022: new scientific advances, techniques, and procedures

Congreso Nacional de Técnicos en Emergencias Sanitarias 2022. Novedades técnicas, científicas y procedimentales

Fernando López Mesa¹, Jonatan Sáez Soldado², Javier Abella Lorenzo³

Introduction

Emergency medical technicians (EMTs) form the backbone of the Spanish prehospital emergency medical system. There is no intervention unit or ambulance in which national legislation does not require this role as part of its staffing. This fact is even more relevant considering that most medical transport (approximately 80%)¹ is carried out autonomously and exclusively by EMTs in type B ambulances.²

As a legally recognized health care profession with defined competencies, EMTs possess the capacity and autonomy to pursue professional development within the scope of their functions. This not only provides an opportunity but also entails a responsibility to do so. Since their work is entirely conducted in the field of emergency and urgent care, EMTs have a privileged and unique perspective on the needs and shortcomings of the health care system, both from an assistive and logistical standpoint.

Therefore, sharing these insights is extremely valuable for improving patient care. Bringing together the needs and experiences gathered across different regional emergency services in a scientific context allows for the identification of key improvement areas.

Events such as the National Congress of Emergency Medical Technicians, held in September 2022 in La Rioja (Spain), serve as an ideal forum for this purpose, providing opportunities to learn about, test, and assess the latest innovations and updates in techniques, materials, equipment, and clinical procedures.

This one-day national congress addressed the need to share scientific and technological advancements, a particularly relevant goal after two years in which the COVID-19 pandemic prevented such gatherings.

Organized under the title "The EMT in Public Emergency Medical Services," the congress was divided into round tables, theoretical-practical workshops, and commercial exhibition areas, allowing for a thematic approach to the different aspects discussed. The event

was officially endorsed by the Spanish Society of Emergency Medicine (SEMES) and accredited by the Health Department of the Government of La Rioja.

Congress objectives

The congress had two main objectives:

- To update EMT technical and procedural competencies based on scientific evidence.
- To present procedures and successful cases from various Emergency Medical Services (EMS) across Spain's autonomous communities during the COVID-19 pandemic.

Additionally, specific workshops were organized with the practical objectives outlined in Table 1.

Congress content

Congress activities were selected using the Delphi method. A panel of EMT experts was convened to identify the objectives and topics most relevant to the congress, based on their potential impact on professional development.

During the opening lecture, delivered by the Director of the Operational Area of the Public Health care and Assistance Management Company of the Balearic Islands (GSAIB) SAMU061, the advantages of an integrated public management model for emergency transport services were discussed. This model includes coordination, management of type C and type B emergency units, logistics, dispatch centers, and scheduled transfers in type A units. Furthermore, the talk highlighted the additional roles EMTs performed during the SARS-CoV-2 pandemic, such as airport control operations and the implementation of the "InfoCovid" telephone service staffed by EMTs. The presentation described the experience in the Balearic Islands (Spain) since the establishment of the public company in 2018, where EMTs have expanded their work beyond direct patient care to include logistics and management, offering insights into the challenges faced during this significant transition. This perspective may be particularly use-

Author Affiliations:

¹Vocalía Nacional de Técnicos, Sociedad Española de Medicina de Urgencias y Emergencias. Servicio de Emergencias Municipal PIMER-PC, Ayuntamiento de Pinto, Madrid, Spain.

²SAMUR-Protección Civil, Ayuntamiento de Madrid, Madrid, Spain.

³Subsecretaría Técnica y de Relaciones Profesionales. Vocalía de TES SEMES. 061 Galicia, Spain.

Corresponding Author:

Fernando López Mesa. Servicio de Emergencias Municipal PIMER-PC. Ayuntamiento de Pinto, Madrid, Spain.

E-mail:

felome@gmail.com

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Table 1. Practical workshops of the congress

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| 1. Use hemostatic devices and techniques during a practical workshop with real-life scenarios. |
| 2. Apply health care logistics materials during a hands-on workshop with real vehicles and equipment. |
| 3. Use protective equipment and practice donning/doffing techniques under safe conditions. |
| 4. Perform high-quality CPR on simulators equipped with feedback devices. |
| 5. Learn the principles and management of manual and basic mechanical ventilation in critically ill patients. |
| 6. Perform the primary assessment of a severely injured trauma patient following the ITLS methodology in a systematic, comprehensive, and efficient manner for any patient, in any environment, and with any injury. |
| 7. Learn about a pediatric immobilization and extrication system. |
| 8. Use a harness for patient transport that frees weight from the upper limbs. |

CPR: cardiopulmonary resuscitation; ITLS: International Trauma Life Support.

ful for other services initiating a transition to integrated public management systems.

During the round table “Scientific Advances for Emergency Medical Technicians,” the protocol for prehospital hypoglycemia management developed by the SEMES Working Group on Diabetes, Endocrinology, and Metabolism was presented. A significant advancement in the management of severe hypoglycemia—known as “hypoglycemic bailout”—is the introduction of nasal glucagon, which provides a less invasive route of administration and does not require reconstitution, thus reducing resistance to its use by EMTs.^{3,4}

The same session also introduced the “Emergency Quick Reference Guide for EMTs,” published by Arán Publishing. This guide is designed as a quick consultation tool for EMTs in their daily clinical practice. It is organized into 6 color-coded sections: Patient Assessment, Anatomy, Traumatology, Obstetrics, Neonatology and Pediatrics, and Patient Transfer and Handover. Information is presented through tables, charts, and illustrations for easy access during emergency care. The guide is complemented by an extensive list of abbreviations, acronyms, a glossary, and specialized bibliography.⁵

Additionally, the “Decalogue of the EMT Profession” was promoted, outlining the set of principles, rights, and duties voluntarily assumed by EMTs in their professional practice—principles that have become consolidated over recent years. The aim is twofold: to enhance public recognition of the professional role and to establish ethical guidelines as a point of reference in addressing professional dilemmas and reducing subjectivity in decision-making.

Ultimately, the decalogue also serves to protect professionals from external pressures of social, political, or economic nature. It functions as a framework of professional ethics and commitment, guiding EMTs to perform their duties with dignity, a critical spirit of self-improvement, and a commitment to public service.⁶

In the round table “Roles and Competencies of EMTs in Public EMS,” real-life cases were used to illustrate the various functions performed by EMTs in both ground and air emergency units, as well as in Emergency Coordination Centers (ECCs).

Type B ambulances play a central role in EMT operations, functioning fully autonomously and accounting for three out of every four medical responses. The lecture “EMTs in Basic Life Support at GSAIB SAMU061” used a real case to demonstrate the importance of performing a thorough assessment—including complete anamnesis—when making patient care decisions. Transmitting this information accurately to both the ECC and the hospital team is key to ensuring continuity of care.

The role of EMTs in type C ambulances was discussed in the session “EMTs in Advanced Life Support at the Emergency Medical Center,” presented by Emergency Medical Services 061 Andalusia. The talk emphasized the importance of teamwork, where differences in scope of practice should not create barriers. Effective patient care is interdependent, requiring that each team member understand the roles of others to anticipate needs and ensure smooth coordination.

The presentation “EMTs in Air Medical Transport at SUMMA112” focused on the specific characteristics of EMT work in helicopter missions, which, while similar to type C ground units, involve unique operational aspects. In this particular service, EMTs assist with in-flight safety, takeoff, and landing operations and manage all patient-related in-flight communications. Attendees also learned and reviewed basic safety measures for joint helicopter operations through diagrams and real videos.⁷

The final presentation, “Management of Telephone-Assisted CPR,” delivered by SAMUR–Civil Protection, whose operations center is managed entirely and exclusively by EMTs, highlighted that the functions of an EMT within a ECC are not limited to receiving emergency calls or coordinating medical resources. With an established protocol for telephone-assisted guidance, EMTs can provide precise first-response instructions to bystanders and callers during emergencies.

This applies to situations such as cardiac arrest (CA), childbirth, or major hemorrhages. The actions of bystanders guided by the ECC can significantly alter the patient’s prognosis and survival. In the case of CA, this guidance can be essential for complete recovery, as demonstrated in a real case presented during the session. The actual call recording was played, in which the coordinating EMT successfully instructed the caller to perform resuscitation maneuvers. The presentation of this real case emphasized not only the importance of having a standardized procedure, but also of practicing the technical and psychological skills necessary to achieve effective guidance. This type of presentation allowed attendees to acquire new skills in this aspect of their work.⁸

Following this session, it became evident that the adaptability of EMTs to different emergency service structures makes them a versatile and essential figure in the provision of urgent medical care.

The morning session concluded with an award ceremony recognizing congress attendees who posted the most tweets on Twitter. This activity aimed to underscore the increasing importance of social media in the dissemin-

nation of scientific content—as a fast, accessible, and convenient tool for sharing knowledge and staying informed.

During the roundtable “Pandemic Experience and Lessons Learned,” the diverse experiences of several EMS during the SARS-CoV-2 pandemic were shared.

The experiences of EMTs from different EMS primarily involved the logistical deployment of structures for both medical care and the disinfection of equipment and materials, as well as the reactivation of operational resources.

Three public EMS—GSAIB SAMU061, SAMUR–Civil Protection, and SUMMA112—shared their experiences. Due to the extraordinary circumstances of the pandemic, a rapid adaptation was required, seeking immediate solutions to emerging needs. These included the installation of temporary hospital structures, modification of collective transport systems, and the implementation of new cleaning and disinfection circuits for transport units and materials, among others.

All 3 services presented the specific solutions they adopted, allowing others to learn and prepare for future situations, minimizing the need for improvisation and the reliance on makeshift resources.

Some services, such as SAMUR–Civil Protection, presented their Special Procedures Unit, which includes the NRBQ Unit (nuclear, radiological, biological, and chemical risk). This unit was responsible not only for direct patient intervention and decontamination of personnel and vehicles but also for internal and external training on donning and doffing personal protective equipment (PPE) in biological risk environments. All speakers emphasized the importance of specific training and team preparedness for managing chemical and/or biological hazards.⁹

The session concluded with the pioneering Spanish experience of an onboard health record system implemented in type B ambulances of the Catalonia EMS. The presentation detailed the Basic Life Support (BLS) care report, notable for its extensive and detailed patient anamnesis, which ensures traceability of care from initial response to hospital arrival. All recorded data comply with current regulations requiring the documentation of all medical care provided and allow for data analysis aimed at studying and improving prehospital medical assistance. Additionally, this information can be used for research purposes, promoting continuous improvement in the quality of EMS-provided care.

Practical workshops

Moreover, the congress featured 11 practical workshops, 1 indoor commercial exhibition in the entrance hall of the Riojaforum conference center, and 1 outdoor display showcasing emergency vehicles and proposals from ambulance manufacturers. Highlights included:

– A workshop led by SAMUR–Civil Protection’s Special Procedures Unit, where participants practiced assembling temporary medical structures such as tents, rapid-deployment shelters, and partitions. Participants evaluated the advantages and disadvantages of each setup, noting their

practicality, simplicity, and speed of assembly. They also practiced working in a decontamination cabin for CBRN incidents.

– The protective equipment workshop allowed attendees to practice donning and doffing techniques for various PPE suits and respiratory protection devices. A novel respiratory protection system introduced during the pandemic was presented—comprising a motorized ventilator with next-generation filters designed to block gases, vapors, and particles. Manufactured by Adaro, the system uses a fully sealed hood with dual protection layers covering the head, face, and neck.¹⁰

Current PPE legislations were reviewed, emphasizing their importance, especially since such equipment became essential during the COVID-19 pandemic.

– In the outdoor commercial exhibition, the ambulance manufacturer Eurogaza presented its latest-generation emergency ambulance models. A type C ambulance, designed and equipped in accordance with UNE-EN 1789:2021 standards,¹⁰ was showcased. It featured iN-TRAXX mounts, certified through crash tests with forces up to 26 G, designed to effectively secure a variety of emergency equipment and supplies. The vehicle also included a fully electric stretcher platform, allowing for improved handling by EMTs. Its interior was made of thermoformed ABS material, with antibacterial and fungicidal properties, and integrated touch-screen control via the CAN BUS electrical system, enabling supervision and management of all onboard electrical systems—from heating and exterior lighting to battery monitoring—through a single touchscreen interface.¹¹

– The company Simulando y Reanimando presented products for clinical simulation training. They demonstrated portable, reusable simulation equipment suitable for repeated use within and across training sessions. Participants learned patient characterization techniques to enhance realism, strategies for planning simulation sessions, and the design of scenarios to meet specific educational objectives.¹²

– During the workshop presenting the Pediatric Immobilization and Extraction System (S.I.P.E. Baby Rescuer), provided by the Smart Baby Foundation, EMTs worked with this device, which allows for proper head, neck, and trunk immobilization during extraction and transport of pediatric trauma patients. Designed for all types of polytrauma, it is compatible with other immobilization devices, such as the long rescue board, spinal body board, and vacuum mattress. The device requires two healthcare professionals—one to stabilize the patient and another to apply the S.I.P.E. Baby Rescuer.¹³

– Another training proposal involved the TMR Vera – Tactical Mobility Rescue Harness by Ponsa, a device designed for prehospital patient transport. Developed by health care professionals, it enables hands-free evacuation of patients secured on spinal boards, increasing safety during transport maneuvers.¹⁴

– In the emergency ventilator maintenance and use workshop, led by Weinmann Medical Technology, partici-



pants trained with the MEDUMAT EasyCPR, a compact emergency ventilator for mechanical ventilation (MV). Ideal as an initial MV device, it provides voice-guided instructions and other functions for artificial respiration and resuscitation. Lightweight and compact, it fits easily into an emergency backpack or case. With the MEDUtrigger, ventilation impulses can be delivered directly through the mask for artificial respiration. Thus, the MEDUMAT EasyCPR replaces the manual resuscitation bag while providing the safety of a mechanical ventilator.¹⁵

– The 600 attending EMTs were able to test their skills in performing cardiopulmonary resuscitation (CPR) using a CPR training system with visual and auditory feedback (QCPR) developed by Laerdal Medical. Conducted in the form of a competition, it consisted of performing CPR techniques on Little Anne QCPR manikins equipped with a feedback device that allows visualization of the quality of both compressions and ventilations. This method aims to improve CPR technique, both in the application of chest compressions and bag-mask ventilation, as it enables visual correction of errors during performance, thereby enhancing overall quality. The results are presented as percentage scores, providing CPR instructors with an objective measure for evaluating their trainees. These types of real-time feedback devices for monitoring compression quality have demonstrated their usefulness and have been shown to be associated with pulse recovery in cases of CA.^{16,17}

– The company Bexen Cardio, specialists in defibrillators, showcased the Reanibex range—from the model 100, designed for laypersons, to the 300 and 500 models for emergency services, and the 700 and 800 models for hospital emergency departments. The Reanibex 500 EMS, noted for its compactness, lightness, and advanced functions, was particularly highlighted. It includes 4 operating modes: Monitor, Manual Defibrillator, Automatic Defibrillator, and Pacemaker. It can monitor 12-lead ECG, oxygen saturation (SpO₂), capnography (EtCO₂), and non-invasive blood pressure (NIBP). Reanibex defibrillators feature data management applications that allow transfer and administration of usage data: a desktop app for ECG viewing, a mobile app for cloud synchronization, and a web app for data storage and visualization. Devices equipped with GSM modules can transmit data directly or through the Reanibex Data Link application.¹⁸

– The company Servytronix joined the extensive educational and exhibition offerings, specializing in the maintenance, repair, verification, and calibration of medical, technical, and research equipment, as well as the issuance of

verification, calibration, and electrical safety certificates, and equipment sales. One of its main features is providing on-site repair, calibration, and verification services, eliminating the need to transport equipment from the clients' facilities.¹⁹

– In the workshop on exsanguinating hemorrhage control, participants tested various hemostatic devices imported by Adaro, including next-generation tourniquets, Israeli bandages, and hemostatic agents.²⁰

– The training sessions concluded with the Optimized Cardiopulmonary Resuscitation Workshop presented by Caryosa, featuring the Lifepak CR2 Automated External Defibrillator (AED). This AED allows chest compressions during ECG rhythm analysis, minimizing interruptions between CPR and defibrillation. The exclusive cprINSIGHT technology of Lifepak CR2 automatically analyzes and detects whether a shock is required, significantly reducing or eliminating pauses if no shockable rhythm is detected. Connected via Wi-Fi, it provides emergency personnel with a comprehensive view of each cardiac arrest event, allowing them to review ECG data and shock history before arriving at the scene, thus improving preparedness and patient care.²¹

Perceived quality results

A survey on congress quality was distributed to attendees via a custom Google Docs® questionnaire in November 2022, sent through personalized email invitations. The results are presented in [Table 2](#).

Conclusions

The National Congress of Emergency Medical Technicians proved to be a valuable tool for the scientific and professional development of EMTs. The findings reaffirm the need for structured, innovative, and high-quality continuing education for the EMT community. This event represents a professional experience worth repeating, with SEMES playing a key role in fostering continuous training and professional innovation within the EMT field in Spain.

Table 2. Results of the questionnaire sent to participants

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|--|-----|
| Appropriateness of the methodology used | 8.9 |
| Content of the workshops | 7.2 |
| Theoretical content | 7.4 |
| Usefulness for their clinical practice | 6.9 |
| Level of learning achieved | 6.6 |
| Interest generated by the topics presented | 7.0 |
| Overall evaluation of the Congress | 8.0 |

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