# Emergency Medical Technician Education and Training

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**ABSTRACT**

Emergency Medical Services (EMS) training and education are vital and vibrant aspects of a young and evolving profession. This article provides a perspective on this effort in the United States and reviews current activity in Rhode Island.

**KEYWORDS:** Prehospital Emergency Care, Emergency Medical Technician

## INTRODUCTION

Education of prehospital emergency care personnel is an essential element in the function and growth of the emergency care system. EMS in the United States has largely developed through local interpretation of federal guidelines with training to nationally recognized certification levels derived from curricula developed by the Department of Transportation National Highway Traffic Safety Administration (DOT-NHTSA).[1,2]

EMTs are certified according to training level, with individual states setting standards for this training and certification (or licensure, in some cases). All states have several distinct EMT levels, usually at least three. Although states are not bound by DOT-NHTSA standards, as the EMS system matured, the importance of common training standards was increasingly recognized, and DOT-NHTSA standards are now used in most jurisdictions.[1,2,3] The National Registry of Emergency Medical Technicians (NREMT) is a private organization that offers certification exams based on these education guidelines.[4] Currently, NREMT exams are used by 46 states as the basis for certification at one or more EMT certification levels. The NREMT uses sophisticated computer adaptive software for its cognitive testing, providing excellent information about the student's comprehension of the material. Psychomotor testing occurs at a local level.[5]

Until recently, DOT-NHTSA recognized four EMT training levels: EMT-Basic, EMT–Intermediate 85, EMT-Intermediate 99 (The 85 and 99 referring to curricula released in 1985 and 1999, respectively) and EMT-Paramedic.[2]

The procedures and skills allowed at the four levels differ. The EMT-Basic level (EMT-B, or EMT-Ambulance in some jurisdictions) generally includes non-invasive and lower risk skills such as bleeding control, positive pressure ventilation with a bag valve mask, use of oropharyngeal or nasopharyngeal airways, supplemental oxygen administration, and splinting including spinal immobilization. CPR and automatic external defibrillator use are also part of the EMT-Basic scope of practice. Additional skills possibly allowed, depending on jurisdiction and additional training, include administration of a patient's own medicine, of intramuscular epinephrine, non-intravenous (intramuscular, oral, intranasal) administration of other medications such as glucagon and naloxone, and advanced airway management in cardiac arrest patients. A typical EMT-B course includes approximately 100 hours of classroom and clinical training.[6,7,8]

EMT–Intermediates are providers with training and scope of practice between basic (EMT-B) and paramedic (EMT-P) levels. The NREMT had two distinct intermediate level tests until recently, covering both the 1985 and the expanded scope 1999 DOT-NHTSA curricula. EMT-I/85 is a level including enhanced assessment skills and several more invasive interventions than those allowed at the basic level, including intravenous fluid therapy and advanced airway management, typically including endotracheal intubation in patients with cardiac arrest. EMT-I/99 further extends this scope of practice, necessitating additional instruction in cardiac monitoring and pharmaceutical interventions. However, the wide variety of local interpretations resulted in at least 65 different EMT-Intermediate levels across the nation, with up to several hundred hours of training time required beyond that of the EMT-B program.[9-15]

EMT-Paramedics, commonly referred to as "paramedics" (the only technically correct use of the term in the United States), represent the highest standard level of EMT in the United States.[16] Paramedics receive significant education in anatomy, physiology, and pharmacology; they understand why certain treatments work. By comparison, the EMT-Intermediate curriculum typically focuses more on skill performance than on basic science knowledge. Paramedics bring sophisticated assessment skills to the patient's bedside, and perform a variety of medical procedures such as advanced airway management including intubation and cricothyrotomy, an extensive range of pharmaceutical administration, central IV access, manual defibrillation, and pleural decompression.[2]

In addition to this range of EMT-Basic, Intermediate, and Paramedic levels, a variety of specialty EMT levels developed in some jurisdictions. These include curricula tailored

to specific situations and patient conditions, predominantly directed toward expanded scope of practice for the paramedic level. These additional specialty levels are presented in **Table 1**.[16]

Accordingly, by the late 1990s there were several hundred types of certification for EMS personnel within the United States, many of these recognized by no more than a single jurisdiction, county, or state. This multiplicity of certification / licensure levels, the result of locally interpreted national curriculum guidelines, provided an EMT workforce optimized for local operations, but created issues with training, standardization, and reciprocity. It made large ambulance services (serving multiple jurisdictions) cumbersome to operate, and discouraged workforce mobility. EMTs would often have to take additional training programs and pass specific certification examinations when moving from one state to another, an obstacle for both professional and volunteer providers. Cross-border operations became increasingly problematic, and response of hundreds of ambulances from many states to large scale events, such as Hurricane Katrina, even more challenging due to variations in training, scope of practice, medication availability, and communications failures.

**Table 1.** EMT Specialty Levels

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| **Advanced Practice Paramedic or Critical Care Paramedic** | These paramedics have additional training in the management of critical trauma and medical patients and typically staff inter-facility ground and aeromedical transports. Skills include ventilator management, treatment with a wide variety of medications and blood products, intra-aortic balloon pump monitoring, and specialized hemodynamic monitoring. There are specific training programs appearing for pediatric and neonatal critical care paramedics. |
| **Community Paramedic** | Described by some as a public health paramedic, or primary care paramedic, these providers have additional training in prevention, public heath, primary care and health maintenance. |
| **ToxMedic** | Very specific training in the treatment and dealing with hazardous materials exposure and poisoning. Often working in support of HAZMAT and military response teams, these paramedics are adept at operations in a variety of high-level personal protective equipment. |
| **Wilderness Paramedic (and other wilderness EMT levels), FireMedic** | Trained in search and rescue, survival techniques, definitive and prolonged-care measures, preventive medicine, these providers support wilderness search-and- rescue teams, wildland fire operations, and similar austere and wilderness medical settings. |
| **Tactical or NarcMedic** | Supporting certain high-risk law enforcement operations, these paramedics are trained to understand and safely work around (and sometimes) with firearms and other police weapons and tactics. They may integrate with entry teams, respond upon need, or stand by at a safe distance. |
| **Flight Paramedic** | Adding aviation and altitude physiology to a Critical Care Paramedic curriculum, flight paramedics typically staff helicopter and fixed-wing transport programs.[16] |

## NATIONAL EMS SCOPE OF PRACTICE PROJECT

In 2009, the NREMT posted information about transition to a new system of levels for emergency care providers developed by the NHTSA through the National EMS Scope of Practice Project. This extensive project gathered significant data about skill performance, training, value of various interventions, and other factors from a multitude of experts, providers, and educators, and then grouped interventions into EMT levels. The initial goal was that by 2014 these new levels would replace the fragmented system found around the United States. The new classifications are emergency medical responder (EMR, replacing first responder, a provider with a smaller skill set than a basic EMT), emergency medical technician (EMT, replacing EMT-Basic), advanced emergency medical technician (AEMT, replacing EMT-Intermediate 1985 and, in part, 1999), and Paramedic (replacing, in part, EMT-Intermediate 1999 and EMT-Paramedic). Educational requirements for the new levels are similar to prior curricula, but are based on competency, not absolute classroom hours. Slowing this transition process are the momentum of the current system, cost of re-education, and the daunting logistics and human factors involved in simplifying a highly variable system. However, most states, and the NREMT, have now transitioned to the new model, introducing an era with more uniform training at the three new EMT levels.

## PRACTICAL ASPECTS OF EMT TRAINING

Training programs vary, provided that each course meets applicable requirements. Recent textbooks and on-line training materials reflect the new EMT levels, streamlining the lesson plan process for instructors. The transition to competency-based curricula cannot

practically eliminate minimum hour commitments for didactic and clinical aspects of training. EMTs still receive at least 100 hours of training, AEMTs have about 400 additional hours, and paramedics are trained for an additional 1,000 hours or more.

EMT training programs still also vary greatly in format. For example, intensive two-week fast-track programs are available for basic EMTs. Other training programs are months long, up to two years, for paramedics in associate degree programs. In addition to this didactic education, clinical rotations are required. Students must spend time in an ambulance and one or several different hospital services and demonstrate clinical competence in order to be eligible for the certification exam. This clinical time commitment can vary, as indicated, depending on requirements, the level of training sought, and the amount of time it takes an individual student to show competence.[7,9] Accreditation is available for EMT programs from the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP), and is becoming more common.[17] NREMT now requires graduation from an accredited paramedic program as a prerequisite to testing at that level, and is working flexibly with states on bridge programs to facilitate transition to the new levels.

EMT-training programs are offered at a variety of locations: universities, community colleges, technical schools, hospitals or EMS academies.[18,19] Every state has an EMS lead agency, often within the Department of Health, Public Safety, or an equivalent, which regulates and accredits both training programs and the entire EMS system. CoAEMSP requirements for paramedic program accreditation require affiliation with a sponsoring institution, such as a college or academic hospital, eliminating "garage-and-basement" paramedic training programs.

On-line resources are a burgeoning enterprise. A variety of well-established and highly regarded supplemental courses exist as well, such as Basic Trauma Life Support from the American College of Emergency Physicians, Prehospital Trauma Life Support from the American College of Surgeons, Advanced Cardiac Life Support and Pediatric Advanced Life Support from the American Heart Association.[20,21,22] Concepts and approaches from these courses often become incorporated into the initial certification program curricula, both in didactic content and emphasis on skill stations and case or scenario-based teaching. A wealth of topic-specific educational resources is available for continuing education.

Prehospital provider education also includes a minimum number of continuing education (CE) hours required to maintain certification. While the format and specifics may be set at the state or other jurisdiction level, the NREMT now has uniform level-specific requirements.[22] Emergency medicine and EMT-specific journals, educational conferences, and on-line resources may be used to fulfill these requirements.[24-27]

## EMT TRAINING IN RHODE ISLAND

EMT training in Rhode Island reflects national diversity, and is transitioning to mirror new national uniformity. The supervision of these programs must be performed by an instructor coordinator trained and authorized by the Division of Emergency Medical Services at the RI Department of Health and each individual training endeavor must be specifically approved. Entry level EMT-B training entails completion of a 110-hour didactic and practical course, including ED and field observation, passing the NREMT cognitive exam and a local psychomotor exam. Transition to the new EMT curriculum is in process. This basic EMT training is currently available through a wealth of programs, from individual volunteer organizations to private business endeavors to community college-based programs. EMT-C, a skill level unique to Rhode Island but very similar in scope to the DOT-NHTSA I-99 curriculum, requires prior EMT-B certification and completion of an additional 160 hours of training as well as a supervised clinical practicum in intravenous access. Transition to the new Advanced EMT curriculum is underway. EMT-P training requires over 500 hours of classroom training, plus extensive hospital rotations in obstetrics, intensive care, and emergency settings, as well as a field internship. Like EMT-B, RI paramedics take the NREMT exam, and transition to the new Paramedic curriculum is also in progress. Several paramedic training programs exist within RI. College credit earned can be used toward a degree. An undergraduate major in emergency management is also offered.

The RI Department of Health currently mandates continuing education through refresher programs for maintenance of EMT–B and C licensure. The EMT-P license renewal process via the NREMT requires documentation of continuing education hours, which may be obtained at a refresher program or at many other educational opportunities, including on-line sources.[23] For example, Rhode Island Hospital and its Lifespan affiliates, along with the University Emergency Medicine Foundation have sponsored Rescue Rounds since 1999. This monthly EMT CME program, certified by the Office of Emergency Medical Services of Massachusetts for EMTs of all levels, offers credits toward license renewal for prehospital providers both from Rhode Island and neighboring states.

Several other local hospitals offer similar EMT educational opportunities. The RI Metro EMS Chief's Organization sponsors an annual educational conference. In addition, the Department of Surgery, Division of Trauma and Critical Care at Rhode Island Hospital sponsors several annual trauma seminars. Hospital interventional cardiology programs and stroke centers have provided prehospital directed education focused on acute cardiac and stroke care. The EMS for Children program, managed by the Division of EMS of the RI Department of Health, has created an ongoing pediatric educational program for EMTs. This program has recently added web-based

access to the series, expanding its accessibility to the EMT community and with continuing education credits obtained through Brown University. The Division of EMS also provides educational programs to introduce protocol changes or with any new program initiative. (Personal communication, Jason Rhodes, Chief, Division of EMS, Rhode Island Department of Health. August 27, 2013.) All of these efforts help unite and educate Rhode Island's EMTs.

## SUMMARY

Emergency Medical Technician training and education in Rhode Island apply national and state programs appropriately to meet distinct local needs. Dedicated professionals provide both initial certification instruction and ongoing teaching in a wide variety of continuing education programs.

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### Disclosures

The authors have no financial interests to disclose.

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