

Table 2-1. Training and procedures for emergency medical personnel. (Continued)

Emergency Personnel Type	Hours of Training	Curriculum <sup>1</sup>	Skills and Procedures
EMT-P (Advanced or Paramedic)	>1000	Role of the paramedic Human systems and patient assessment Fluids and shock General pharmacology Respiratory system Cardiovascular system Central nervous system Soft tissue injuries Musculoskeletal system Medical emergencies Obstetric and gynecologic emergencies Pediatric emergencies Management of the emotionally disturbed Communications and telemetry Multiple injuries, multiple casualties, and triage	All EMT-A skills plus specialized training in advanced life support skills, including: Intravenous cannulation Invasive airway management including endotracheal intubation Cardiac dysrhythmia recognition Defibrillation Emergency medications

<sup>1</sup>First responder curriculum adapted and reproduced, with permission, from Karen KJ, Halen BG: *First Responder: A Skills Approach*, 2nd ed. Mosby, 1986. EMT-P curriculum from *Emergency Medical Technician Paramedic National Standard Curriculum*, U.S. Department of Transportation, National Highway Traffic Safety Administration, 1999.

Advanced procedures vary widely among communities and may include procedure not listed here.

and equipped to perform defibrillation using automated external defibrillators (AEDs).

## B. EMERGENCY MEDICAL TECHNICIANS (EMTs)

The National Registry of Emergency Medical Technicians currently recognizes 3 formal grades of EMTs according to the typical number of hours of training given, the breadth of skills covered, and the range of procedures authorized: EMT-A (basic), EMT-1 (intermediate), and EMT-P (advanced, paramedic). Designations and levels of training may vary from state to state. Emergency physicians should be familiar with regional variations and deviations from the National Registry guidelines.

1. EMT-A—Basic EMTs constitute the essential workforce of EMS systems throughout the United States. Most state laws require at least one certified EMT on board ambulance vehicles that transport patients.

The basic EMT course requires at least 81 hours of training standardized by the DOT. Basic classes frequently exceed this minimum by up to 140 hours. Students learn basic principles of patient care, how to identify signs and symptoms central to patient assessment and diagnosis, and how to provide treatment in specific emergencies. The use of AEDs is now standard curriculum for EMTs in most regions. Optional modules for EMTs include advanced airway management, intravenous access, and assisting patients with self-administration of medications. Additionally, some states allow administration of medications, including

epinephrine in anaphylaxis and aspirin in suspected cardiac chest pain.

2. EMT-1—The intermediate EMT is trained to provide a level of advanced care in areas that are underserved by paramedics. The scope of practice has evolved since 1990 to incorporate many advanced cardiac life support procedures, including cardiac monitoring, treatment of arrhythmias, defibrillation, and advanced airway management with either endotracheal intubation or an alternative airway.

3. EMT-P—Advanced EMTs (paramedics) receive over 1000 hours of training in ALS techniques. Their skills include the basic EMT procedures as well as intravenous cannulation, invasive airway management (including endotracheal intubation), recognition of cardiac dysrhythmias, defibrillation, and the use of specific emergency medications. In addition to extensive classroom training, EMT-P personnel also complete clinical training and a field internship with experienced paramedic teams.

Paramedics operate under standing orders and treatment protocols developed by a physician medical director that are usually broader and more advanced than those guiding basic EMTs. These protocols determine the type and level of care administered at the emergency site. Physicians who provide on-line medical supervision of paramedics (by radio and telemetry) from base hospitals may permit paramedics to deviate from established protocols or to provide treatment not specifically covered in standing orders.

## Special Qualifications

Additional training is available at all levels of providers for specific care settings. At the first responder level, a Winter Emergency Care course has been developed for the National Ski Patrol to address special situations that occur in ski areas. Similarly there are Wilderness modules at all levels of training that provide additional training for care provided in a remote setting with anticipated long evacuations and transportation. EMT-Tactical courses train EMTs and paramedics to function in a tactical law enforcement situation in which they may support or be part of a police special tactics teams. Finally, Paramedic-Critical Care training enables the advanced provider to provide care to critically injured or ill patients who are being transferred from one facility to another.

## Types of EMS Systems

EMS systems can be delivered in various ways. There are 2 basic forms of EMS response: a single-response system and a layered-response (or tiered-response) system. In a single-response system, there is only one grade of EMS unit, and the closest available unit is dispatched to any nearby emergency. In a layered-response system, 2 or more grades of EMS personnel respond hierarchically (eg, first responder, then EMT-A, then EMT-P) as needed. Layered-response systems usually provide for an EMT-A response for all less severe reported medical emergencies, reserving an EMT-P response for severe or life-threatening incidents (Table 2-2).

## Communications Network

The communications network is important in tying together the components of an EMS system. A dispatcher at a communications center receives a telephone request from a caller at the site of the emergency and dispatches

Table 2-2. Alternative EMS system designs.<sup>1</sup>

System Type	Response		Transport	
	Emergency	Nonemergency	Emergency	Nonemergency
Single-tier basic life support (BLS)	BLS		BLS	
Single-tier advanced life support (ALS)	ALS		ALS	
Single-tier ALS with first responder	First responder + ALS	ALS	ALS	
Multitier (transport) with first responder	First responder + ALS	ALS	ALS	ALS
Multitier (response and transport) with first responder	First responder + ALS	BLS	ALS	BLS

<sup>1</sup>BLS = EMT-A ambulance; ALS = EMT-P ambulance; first responder = first aid or semiautomated defibrillation.

mobile EMS personnel via the radio network. Dispatchers may use a call triaging system (eg, Priority Medical Dispatching) to assign resources to a call. In many areas of the United States, an easily remembered emergency telephone number (9-1-1) provides the public with rapid access to the communications center. Many systems offer an "enhanced 9-1-1" service that provides immediate callback and location information to the dispatcher.

Communications between the EMS unit and medical facilities varies from region to region. For many BLS transports, contact with the base station or receiving facility is not required. In the event of an ALS transport, contact must be made with a medical facility. In some areas, the facility is called a base station hospital, which provides on-line direction and supervision for an entire EMS region. Information called into the base station hospital is then relayed to the receiving facility. In other areas, the receiving facility is called directly.

## Hospital Facilities & Staffing

EMS systems typically include hospitals with a variety of treatment capabilities, ranging from local community hospitals with a limited emergency department staffing to large teaching hospitals in urban areas with emergency physicians, surgeons, anesthesiologists, and surgical teams available 24 hours a day. Hospital facilities are frequently classified according to their relationship to EMS mobile units and their ability to provide definitive care.

### A. BASE STATION HOSPITALS

Physicians or specially trained nurses with physician backup in the emergency department of the base station hospital provide EMS units with on-line medical supervision during treatment. EMS units may be