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Standard Guide for Training the Emergency Medical Technician (Paramedic)¹

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1. Scope

1.1 This guide covers the training standard for the emergency medical technician (paramedic) to deal with emergencies. Primary care and wilderness/delayed/prolonged context training for the emergency medical technician (paramedic) is not within the scope of this guide, but may be dealt with in other ASTM standards.

1.2 This guide identifies the knowledge and skills that all programs that train the emergency medical technician (paramedic) should include in their training program.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

F 1149 Practice for Qualifications, Responsibilities, and Authority of Individuals and Institutions Providing Medical Direction of Emergency Medical Services²

F 1220 Guide for Emergency Medical Services Systems (EMSS) Telecommunications²

F 1254 Practice for Performance of Prehospital Manual Defibrillation²

F 1255 Practice for Performance of Prehospital Automated Defibrillation²

F 1258 Practice for Emergency Medical Dispatch²

F 1288 Guide for Planning for and Response to a Multiple Casualty Incident²

F 1489 Guide for Performance of Patient Assessment by the Emergency Medical Technician (Paramedic)³

F 1517 Guide for Scope of Performance of Emergency Medical Services Ambulance Operations²

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

¹ This guide is under the jurisdiction of ASTM Committee F30 on Emergency Medical Services and is the direct responsibility of Subcommittee F30.02 on Personnel, Training, and Education.

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² Annual Book of ASTM Standards, Vol 13.02.

³ Discontinued; See 2001 Annual Book of ASTM Standards, Vol 13.01.

3.1.1 *auscultation*—examination by listening with a stethoscope.

3.1.2 *EMSS communications subsystem*—comprises those resource arrangements for notifying the EMS system of an emergency, for mobilizing and dispatching resources, for exchanging information, for remote monitoring of vital indicators, and for transmission of treatment procedures and directions (see Guide F 1220).

3.1.3 *human anatomy*—the branch of science dealing with the structure of the human organisms.

3.1.4 *human physiology*—the science dealing with the functions of the human living organism.

3.1.5 *incident command system*—the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

3.1.6 *inspection*—examination by careful visualization of the body or a part of the body.

3.1.7 *management*—actions taken by the emergency medical technician (paramedic) for a patient in need of assistance due to a real or perceived traumatic or medical condition.

3.1.8 *palpation*—examination by touching with the hand(s).

3.1.9 *stress*—nonspecific response of the body to any demand made upon it.

3.1.10 *topographic anatomy*—a study of all the structures and their relationships in a given region.

3.1.11 *triage*—the process of sorting and making priorities for emergency medical care of the sick and injured on the basis of urgency and type of condition present, number of patients, and resources available.

4. Significance and Use

4.1 This guide establishes the national standard for training the emergency medical technician (paramedic).

4.2 This guide shall be used by those who develop the training curriculum to be used to train the emergency medical technician (paramedic).

4.3 Every person who is identified as an emergency medical technician (paramedic) shall have been trained to this guide.

4.4 It is understood that the scope of the medical practice is constantly evolving. Therefore, this guide does not contain recommendations for the management of illnesses and injuries. Furthermore, it is not intended to supersede the protocols and standing orders of the system medical director or the on-line medical physician (see Practice F 1149).

4.5 This guide does not standardize the scope of practice of the emergency medical technician (paramedic).

5. Anatomy and Physiology

5.1 The emergency medical technician (paramedic) shall describe the anatomy and physiology of the major body systems and the differences that exist because of age and gender to the extent needed to assess and manage patients with the illnesses and injuries in the following sections, using the techniques listed in this guide.

6. Communications and Medical Terminology

6.1 The emergency medical technician (paramedic) shall be able to communicate effectively, using standard medical terminology, about the illnesses and injuries, and the techniques, listed in this guide.

7. Pharmacology

7.1 The emergency medical technician (paramedic) shall be able to apply theory and principles of pharmacological intervention to manage patients with the illnesses and injuries in the following sections, using the techniques listed in this guide.

8. Universal Blood and Body Fluid Precautions

8.1 The emergency medical technician (paramedic) shall be taught the current local, state, Occupational Safety and Health Administration (OSHA), and Center for Disease Control (CDC) recommendations for preventing the transmission of communicable diseases. (See Refs (1, 2, and 3).)⁴

9. Examination Techniques

9.1 The emergency medical technician (paramedic) shall be trained to perform the following examination techniques and use appropriate modifications to accommodate the differences that exist because of age and sex:

9.1.1 Assess respirations for rate, rhythm, symmetry, and quality,

9.1.2 Auscultate for breath sounds,

9.1.3 Assess presence, rate, regularity, and quality of the following pulses: carotid, brachial, radial, femoral, temporal, dorsalis pedis, and posterior tibial,

9.1.4 Palpate blood pressure,

9.1.5 Auscultate blood pressure,

9.1.6 Assess capillary refill,

9.1.7 Assess mental status and level of consciousness,

9.1.8 Assess pupils,

9.1.9 Inspect the body,

9.1.10 Palpate the body,

9.1.11 Assess sensory perception,

9.1.12 Assess motor function,

9.1.13 Assess airway patency,

9.1.14 Assess electrical activity of the heart,

9.1.15 Assess blood glucose level,

9.1.16 Assess temperature,

9.1.17 Assess oxygen saturation level,

9.1.18 Assess the skin and mucous membranes for color, temperature, turgor, and dampness,

9.1.19 Assess the skin for basic primary skin rashes:

9.1.19.1 Macules and patches,

9.1.19.2 Papules and nodules,

9.1.19.3 Wheals (hives),

9.1.19.4 Bullae (blisters), vesicles, and pustules, and

9.1.19.5 Petechiae and purpura.

9.1.20 Assess the fontanelle in infants, and

9.1.21 Assess vision.

10. Examination Devices

10.1 The emergency medical technician (paramedic) shall be trained to use the following:

10.1.1 Blood glucose measurement devices,

10.1.2 Pulse oximeters,

10.1.3 Blood collection devices,

10.1.4 Sphygmomanometer,

10.1.5 Stethoscope,

10.1.6 Penlight,

10.1.7 Thermometer,

10.1.8 Cardiac rhythm monitor,

10.1.9 Twelve-lead ECG monitor,

10.1.10 Laryngoscope,

10.1.11 Amplified listening device, and

10.1.12 Exhaled CO₂ detection devices.

11. Patient Assessment

11.1 The emergency medical technician (paramedic) shall be educated to perform patient assessment in accordance with Guide F 1489.

12. Illnesses and Injuries

12.1 The emergency medical technician (paramedic) shall demonstrate understanding of both the pathophysiology necessary to recognize the clinical presentation and the management of the following in the prehospital context, including the differences that exist because of age and sex:

12.1.1 Airway obstruction or compromise,

12.1.2 Shock:

12.1.2.1 Hypovolemic,

12.1.2.2 Cardiogenic,

12.1.2.3 Distributive, and

12.1.2.4 Obstructive.

12.1.3 Wounds and impaled objects,

12.1.4 Contusions,

12.1.5 Orthopedic Injuries:

12.1.5.1 Extremity fractures, closed and open,

12.1.5.2 Extremity dislocations and subluxations, and

12.1.5.3 Extremity sprains and strains.

12.1.6 Head injuries,

12.1.7 Face fractures,

⁴ The boldface numbers given in parentheses refer to a list of references at the end of the text.

- 12.1.8 Eye injuries,
- 12.1.9 Spinal injuries:
 - 12.1.9.1 Strains, sprains, and fractures, and
 - 12.1.9.2 Back pain and herniated disks.
- 12.1.10 Chest injuries, including:
 - 12.1.10.1 Pericardial tamponade,
 - 12.1.10.2 Flail chest,
 - 12.1.10.3 Sucking chest wound,
 - 12.1.10.4 Rib fractures,
 - 12.1.10.5 Hemothorax, pneumothorax, and tension pneumothorax,
 - 12.1.10.6 Lung and heart contusions, and
 - 12.1.10.7 Great vessel injury.
 - 12.1.11 Pelvic fractures,
 - 12.1.12 Blunt or penetrating abdominal trauma,
 - 12.1.13 Poisonings, drug overdoses, and substance abuse,
 - 12.1.14 Environmental illness and injury:
 - 12.1.14.1 Hypothermia and frostbite,
 - 12.1.14.2 Heat-related illness,
 - 12.1.14.3 Burns:
 - (1) Thermal,
 - (2) Electrical,
 - (3) Chemical,
 - 12.1.14.4 Radiation exposure,
 - 12.1.14.5 Electrical and lightning injuries,
 - 12.1.14.6 Exposure to plant and animal toxins, both land and marine,
 - 12.1.14.7 Near-drowning and cold-water submersion,
 - 12.1.14.8 Altitude illness (acute mountain sickness, high-altitude pulmonary edema, high-altitude cerebral edema), and
 - 12.1.14.9 Barotrauma and decompression sickness.
 - 12.1.15 Obstetric and gynecological illness and injury:
 - 12.1.15.1 Newborn infant,
 - 12.1.15.2 Active labor,
 - 12.1.15.3 Imminent delivery,
 - 12.1.15.4 Uterine atony,
 - 12.1.15.5 Vaginal bleeding,
 - 12.1.15.6 Spontaneous abortion (miscarriage),
 - 12.1.15.7 Pre-eclampsia and eclampsia,
 - 12.1.15.8 Trauma in pregnancy,
 - 12.1.15.9 Abnormal presentations,
 - 12.1.15.10 Ectopic pregnancy,
 - 12.1.15.11 Pelvic inflammatory disease (PID),
 - 12.1.15.12 Abruptio placenta,
 - 12.1.15.13 Placenta previa, and
 - 12.1.15.14 Rape and sexual assault.
 - 12.1.16 Endocrine disorders:
 - 12.1.16.1 Diabetes mellitus,
 - 12.1.16.2 Hyperthyroidism and hypothyroidism,
 - 12.1.16.3 Adrenal insufficiency, and
 - 12.1.16.4 Hypocalcemic tetany.
 - 12.1.17 Respiratory disorders:
 - 12.1.17.1 Respiratory failure and nonspecific respiratory distress,
 - 12.1.17.2 Asthma,
 - 12.1.17.3 Chronic obstructive pulmonary disease,
 - 12.1.17.4 Pulmonary embolism,
 - 12.1.17.5 Toxic inhalations,
 - 12.1.17.6 Pneumonia, bronchitis, and active pulmonary tuberculosis,
 - 12.1.17.7 Hyperventilation,
 - 12.1.17.8 Spontaneous pneumothorax,
 - 12.1.17.9 Bronchiolitis, and
 - 12.1.17.10 Apnea of infancy.
 - 12.1.18 Abdominal pain,
 - 12.1.19 Cardiovascular illness:
 - 12.1.19.1 Non-traumatic cardiac arrest,
 - 12.1.19.2 Hypertension,
 - 12.1.19.3 Angina and myocardial infarction,
 - 12.1.19.4 Abdominal aortic aneurysm,
 - 12.1.19.5 Aortic dissection,
 - 12.1.19.6 Congestive heart failure and pulmonary edema,
 - 12.1.19.7 Pre-excitation syndromes, for example, Wolff Parkinson White,
 - 12.1.19.8 Cardiac rhythms:
 - (1) Normal sinus rhythm,
 - (2) Sinus tachycardia,
 - (3) Sinus arrhythmia,
 - (4) Sinus bradycardia,
 - (5) Atrial fibrillation,
 - (6) Atrial flutter,
 - (7) Atrial tachycardia,
 - (8) Premature supraventricular complexes,
 - (9) Supraventricular escape complexes,
 - (10) Wandering pacemaker,
 - (11) Paroxysmal supraventricular tachycardia (PSVT),
 - (12) Ventricular escape complexes,
 - (13) Premature ventricular complexes,
 - (14) Ventricular tachycardia/toursades de pointes,
 - (15) Ventricular fibrillation,
 - (16) Asystole,
 - (17) Supraventricular tachycardia,
 - (18) First-degree AV block,
 - (19) Second-degree AV block (Wenkebach/Mobitz Type I),
 - (20) Second-degree AV block (classical Mobitz Type II),
 - (21) Third-degree AV block,
 - (22) Bundle branch block/aberrant ventricular conduction,
 - (23) Junctional rhythms,
 - (24) Pacemaker rhythms,
 - (25) Electromechanical dissociation, and
 - (26) Arterial occlusion and deep venous thrombosis.
 - 12.1.20 Neurological:
 - 12.1.20.1 Headache, including subarachnoid hemorrhage,
 - 12.1.20.2 Transient ischemic attack and cerebro-vascular accident (stroke),
 - 12.1.20.3 Seizures,
 - 12.1.20.4 Syncope and near syncope,
 - 12.1.20.5 Coma,
 - 12.1.20.6 Meningitis,
 - 12.1.20.7 Vertigo, and
 - 12.1.20.8 Impaired level of consciousness.
 - 12.1.21 Genitourinary illness:
 - 12.1.21.1 Kidney stones,
 - 12.1.21.2 Pyelonephritis,

- 12.1.21.3 End-stage renal disease,
- 12.1.21.4 Testicular torsion, and
- 12.1.21.5 Urinary retention.
- 12.1.22 Ear/nose/throat emergencies:
 - 12.1.22.1 Epistaxis (nosebleed),
 - 12.1.22.2 Dental fractures,
 - 12.1.22.3 Epiglottitis and croup,
 - 12.1.22.4 Peritonsillar abscess,
 - 12.1.22.5 Jaw dislocation,
 - 12.1.22.6 Jaw fracture, and
 - 12.1.22.7 Laryngeal injury.
- 12.1.23 Chest pain,
- 12.1.24 Gastrointestinal illness:
 - 12.1.24.1 GI bleeding, and
 - 12.1.24.2 Vomiting and diarrhea.
- 12.1.25 Allergic reactions:
 - 12.1.25.1 Localized,
 - 12.1.25.2 Generalized, and
 - 12.1.25.3 Anaphylaxis.
- 12.1.26 Infectious disease,
- 12.1.27 Oncological illness (cancer):
 - 12.1.27.1 Spinal cord compression, and
 - 12.1.27.2 Airway compromise.
- 12.1.28 Terminal illness,
- 12.1.29 Psychiatric and behavioral illness (situational, organic, and primary psychiatric),
- 12.1.30 Sickle cell disease and crisis, and
- 12.1.31 Physical and emotional abuse in all age groups.

13. Patient Management Techniques

13.1 The emergency medical technician (paramedic) shall be trained in the use of the following patient management techniques and devices to the extent needed to manage the illnesses and injuries listed in this section:

- 13.1.1 Respiratory management techniques:
 - 13.1.1.1 Techniques and devices to open and maintain the airway:
 - 13.1.1.1.2 Head-tilt-chin-lift,
 - 13.1.1.1.3 Finger sweeps,
 - 13.1.1.1.4 Modified jaw thrust,
 - 13.1.1.1.5 Jaw thrust,
 - 13.1.1.1.6 Abdominal thrust,
 - 13.1.1.1.7 Chest thrust,
 - 13.1.1.1.8 Tongue-jaw-lift,
 - 13.1.1.1.9 Sellick's maneuver (cricoid pressure),
 - 13.1.1.1.10 Cricothyroidotomy,
 - 13.1.1.1.11 Oropharyngeal/nasopharyngeal airways,
 - 13.1.1.1.12 Orotracheal/nasotracheal intubation, and
 - 13.1.1.1.13 Suction devices:
 - 13.1.1.1.14 Mechanical suction,
 - 13.1.1.1.15 Filtered small-bore trap suction (for example, modified DeLee),
 - 13.1.1.1.16 Bulb syringe,
 - 13.1.1.1.17 Suction catheters:
 - 13.1.1.1.18 Rigid tonsillar suction catheter, and
 - 13.1.1.1.19 Flexible suction catheter,
 - 13.1.1.1.20 Techniques and devices to provide ventilatory assistance:

- 13.1.1.21 Mouth-to-mouth,⁵
- 13.1.1.22 Mouth-to-nose,⁵
- 13.1.1.23 Mouth-to-mouth and nose,⁵
- 13.1.1.24 Mouth-to-stoma,⁵
- 13.1.1.25 Mouth-to-mask⁵, and
- 13.1.1.26 Positive pressure ventilatory devices,
- 13.1.1.27 Oxygen delivery devices:
 - 13.1.1.28 Low-concentration oxygen delivery devices, and
 - 13.1.1.29 High-concentration oxygen delivery devices,
 - 13.1.1.30 Needle thoracostomy,
- 13.1.2 Techniques for management of the compromised circulatory system:
 - 13.1.2.1 Direct pressure to the source of bleeding,
 - 13.1.2.2 Pressure dressings,
 - 13.1.2.3 Patient positioning,
 - 13.1.2.4 The pneumatic antishock garment, and
 - 13.1.2.5 Intravenous (IV) fluid replacement therapy.
- 13.1.3 Use of spinal immobilization techniques and devices:
 - 13.1.3.1 Manual immobilization,
 - 13.1.3.2 Cervical spine immobilization devices,
 - 13.1.3.3 Short-spine immobilization devices,
 - 13.1.3.4 Long-spine immobilization devices, and
 - 13.1.3.5 Helmet removal,
- 13.1.4 Techniques and devices for the management of musculoskeletal injuries (non-spine):
 - 13.1.4.1 Manual stabilization,
 - 13.1.4.2 External immobilization fixation techniques and devices:
 - 13.1.4.3 Traction devices,
 - 13.1.4.4 Rigid devices,
 - 13.1.4.5 Pneumatic devices, and
 - 13.1.4.6 Management of pulseless extremities,
 - 13.1.5 Techniques for the management of soft tissue injuries:
 - 13.1.5.1 Aseptic technique,
 - 13.1.5.2 Management of amputations, and
 - 13.1.5.3 Bandaging techniques.
- 13.1.6 Assisting with spontaneous newborn delivery:
 - 13.1.6.1 Normal spontaneous vertex delivery,
 - 13.1.6.2 Uterine massage, and
 - 13.1.6.3 Abnormal presentations.
- 13.1.7 Techniques for restraining patients,
- 13.1.8 Patient positioning techniques for medical emergencies,
- 13.1.9 Techniques and routes for medication administration including:
 - 13.1.9.1 Subcutaneous and intramuscular injections,
 - 13.1.9.2 Intravenous bolus,
 - 13.1.9.3 Intravenous drip,
 - 13.1.9.4 Endotracheal route,
 - 13.1.9.5 Intraosseous route,
 - 13.1.9.6 Rectal route,
 - 13.1.9.7 Sublingual route,
 - 13.1.9.8 Transcutaneous route,
 - 13.1.9.9 Medication nebulizer, and

⁵ The requirements of Refs 4, 5, and 6 should be taught with regard to the use of this procedure in the field.