

Emergency Medical Technician-III Course Objectives

Developed by:

State EMS Training Committee
a subcommittee of the
Alaska Council on
Emergency Medical Services

Copies of these objectives may be obtained from:

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PREFACE

The purpose of this outline is to present a framework for the instruction of Emergency Medical Technician-III initial training program approved by the Alaska Department of Health and Social Services to qualified students. The purpose of the EMT-III level of training is to allow rural communities to provide basic emergency cardiac care.

The EMT-III course contains a very small subset of the Mobile Intensive Care Paramedic training program and focuses on a limited number of interventions and medications that are likely to be effective and may reasonably be taught and learned in a program of this length.

Section 7 AAC 26.040 of the Alaska Administrative Code (regulations) defines the scope of certified activities on which the objectives in this document are based. 7 AAC 26.050 sets forth the criteria for EMT-III course approval, including requiring that EMT-III courses be at least 50 hours in length. This document divides the course content into “sections,” each of which has a recommended length. The times for each section are estimates only and will vary with the students’ and system’s needs.

The instruction of medications and procedures which are not covered in the EMT-III scope of certified activities will, of course, require an increase in the number of hours taught. There is a series of steps to have additional medications or procedures approved by the Department of Health and Social Services. They are outlined in 7 AAC 26.670 and should be read and understood by local physician medical directors, EMS instructors and system administrators.

Agencies which contract with EMT-III instructors for training should carefully consider the local scope of activities when developing proposals and contracts. While 50 hours is adequate to teach core EMT-III material, it is not sufficient to teach the additional skills and procedures used in many communities. Increased attrition and substandard care are likely if the EMT-III training program is of insufficient quality or length. The recommended durations of the sessions include ample time for instructor-developed quizzes.

The emergency cardiac medications and procedures in this course are intended to be taught in a manner consistent with the American Heart Association's recommendations for Emergency Cardiac Care. In the event that the contents of the course deviate from current ACLS recommendations regarding emergency cardiac medications and procedures within the EMT-III Scope of Certified Activities, the ACLS recommendations will take precedence, except if specific protocols for the area of conflict, such as the *Alaska Prehospital Trauma Guidelines*, or the *Cold Injuries Guidelines*, exist.

Nothing in this document should be construed to represent the advocacy for EMT-III to comply with American Heart Association recommendations which exceed the scope of certified activities outlined in 7 AAC 26.040, e.g. the use of amiodarone and 12-lead monitoring. The addition of skills and procedures at the local level must be carefully

considered and implemented in a medically and administratively appropriate manner by the physician medical director.

This curriculum is designed to build upon the EMT-I and EMT-II knowledge and skills contained in the Alaska EMT-I and EMT-II courses. Additionally it outlines what knowledge and skills are expected of an Alaska EMT-III. It does not prohibit the physician sponsor from specifying the scope of activities, whether that be limiting practice to a subset of the EMT-III skills or expanding the EMT-III's skills in accordance with 7 AAC 26.670. Evolving issues should be covered thoroughly by the instructor.

Psychomotor skills in which the EMT-III should be proficient include:

- performing all EMT-I skills;
- performing all EMT-II skills, including orotracheal intubation and inserting multi-lumen airways, peripheral IV treatment, obtaining blood for analysis, and administering of D₅₀W and naloxone (laryngeal mask airway psychomotor development is optional);
- applying ECG electrodes and monitoring cardiac activity;
- countershocking ventricular fibrillation and pulseless ventricular tachycardia; and
- storing and properly administering aspirin, nitroglycerin, epinephrine 1:1,000, epinephrine 1:10,000, lidocaine, atropine, morphine, as well as EMT-I and II medications.

ANY venipunctures performed on people SHALL be performed with a needle manufactured with a “safe” design.

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SECTION 1 – ROLES AND RESPONSIBILITIES

At the completion of this section, the student will be able to:

- 1.1 List current state requirements for enrollment in an EMT-III training program.
- 1.2 Identify and describe those activities performed by an EMT-III in the field.
- 1.3 Define the role of an EMT-III.
- 1.4 Compare and contrast the roles of an EMT-I, EMT-II, EMT-III, and MICP.
- 1.5 List current state requirements for EMT-III continuing education.
- 1.6 Define and discuss at least three reasons why continuing education is important to the EMT-III.
- 1.7 State the reason it is important to keep one's EMT-III certification current.
- 1.8 Describe methods of obtaining continuing medical education.
- 1.9 List the duties of the EMT-III before, during, and after an emergency call.
- 1.10 List current state requirements for EMT-III recertification.
- 1.11 Discuss skill deterioration and methods of prevention.
- 1.12 Contrast the scope and length of EMT-III training programs and MICP training programs.

Recommended time: 30 minutes

SECTION 2 – EMS SYSTEMS

At the completion of this section, the student will be able to:

- 2.1 Define medical control per 7 AAC 26.640 (medical director responsibilities: certified persons).
- 2.2 Describe the responsibilities of the physician medical director, per 7 AAC 26.640 (medical director responsibilities: certified persons).
- 2.3 List the steps necessary for the medical director to add additional skills to the EMT-III scope of practice under 7AAC 26.670 (additional skills and procedures).
- 2.4 Describe the relationship between a physician on the scene, the EMT-III on the scene, and the EMS physician providing medical direction.
- 2.5 Define protocols and standing orders.
- 2.6 Discuss the EMT-III's initial responsibilities when arriving on the scene.
- 2.7 Describe the relationship between the service's physician medical director and the EMT-III.
- 2.8 Describe the transition of patient care from the EMT-III including:
 - a. transfer of responsibility (legal and medical); and
 - b. reporting of patient status to physician, midlevel provider, nurse, or ALS responder.
- 2.9 Describe retrospective evaluation of patient care, including physician run critiques, run report review, continuing education, skill practice, and skill deterioration.
- 2.10 Describe engineering controls, work practice controls, and personal protection equipment to protect the EMT-III from airborne and bloodborne pathogens.
- 2.11 Explain what is meant by an exposure to airborne or bloodborne pathogens and describe post-exposure management.
- 2.12 Discuss the benefits of quality assurance programs.

Recommended time: 30 minutes

SECTION 3 – CARDIOVASCULAR ANATOMY AND PHYSIOLOGY

At the completion of this section, the student will be able to:

- 3.1 Given a diagram, identify the following cardiac structures:
 - a. apex;
 - b. base;
 - c. pericardium;
 - d. epicardium;
 - e. myocardium;
 - f. endocardium;
 - g. chambers;
 - h. valves;
 - i. great vessels; and
 - j. coronary arteries.
- 3.2 Given a diagram, identify the following components of the cardiac conduction system, and describe their function:
 - a. SA node;
 - b. internodal pathways;
 - c. AV node;
 - d. bundle of His;
 - e. bundle branches; and
 - f. Purkinje fibers.
- 3.3 Describe the physiology of the heart including the following:
 - a. location;
 - b. orientation;
 - c. size;
 - d. shape;
 - e. cardiac cycle; and
 - f. pumping action (right vs. left-sided pump).
- 3.4 Describe normal blood flow starting from the right atrium and ending back at the right atrium.
- 3.5 Define Starling's Law as related to cardiac contractility.
- 3.6 Define the following terms:
 - a. stroke volume;
 - b. contractility;
 - c. preload;
 - d. afterload;
 - e. heart rate;
 - f. cardiac output; and
 - g. systemic vascular resistance.

- 3.7 Describe the effects of the autonomic nervous system on the cardiovascular system, including:
 - a. parasympathetic stimulation; and
 - b. sympathetic stimulation.
- 3.8 Describe the automatic, inotropic, chronotropic, and conductive properties of cardiac muscle.

Recommended time: 4 hours

SECTION 4 – BASIC ELECTROPHYSIOLOGY AND ELECTROCARDIOLOGY

At the completion of this section, the student will be able to:

- 4.1 Discuss electrolytes as related to electrical conduction in the heart.
- 4.2 Define the following terms and related them to electrical activity in the cardiac cycle:
 - a. resting state;
 - b. depolarization; and
 - c. repolarization.
- 4.3 Describe refractory period, including the relative and absolute refractory periods.
- 4.4 Apply ECG electrodes to a simulated patient.
- 4.5 Operate a cardiac monitor, including:
 - a. turning on/off the machine;
 - b. selecting and changing a monitoring lead;
 - c. printing a cardiac rhythm strip;
 - d. changing the paper;
 - e. selecting an appropriate energy for defibrillation; and
 - f. charging either paddles or hands-free defibrillation patches and delivering a shock to a manikin designed for this purpose.
- 4.6 List three pieces of information that can be determined from a rhythm strip.
- 4.7 Appreciate that a myocardial infarction cannot be determined using a rhythm strip.
- 4.8 Describe the purpose and the units of measurement of all the lines on ECG paper.
- 4.9 Review the relationship of ECG tracing to electrical events in the heart:
 - a. P wave;
 - b. PR interval;
 - c. QRS complex; and
 - d. T wave.
- 4.10 Define “artifact” as it relates to ECG display.
- 4.11 List three causes of artifact on an ECG tracing.
- 4.12 Systematically analyze a rhythm strip, using a format which includes:
 - a. rate;
 - b. rhythm/regularity;
 - c. P waves;
 - d. PR interval; and
 - e. QRS complexes.
- 4.13 Describe two methods for determining the rate from an ECG tracing, and describe when each is most appropriate.

- 4.14 Describe the normal values for the following components of an ECG rhythm strip:
 - a. rate;
 - b. rhythm;
 - c. P waves;
 - d. PR interval; and
 - e. QRS complex duration.
- 4.15 Demonstrate how to properly assess the cause of poor ECG tracings.
- 4.16 Demonstrate the proper use of either defibrillator paddle electrodes or “hands-free” patches to obtain a sample Lead II rhythm strip.
- 4.17 Identify the following on any rhythm strip:
 - a. P waves;
 - b. QRS complexes;
 - c. P-P intervals;
 - d. R-R intervals;
 - e. PR intervals;
 - f. ST segments;
 - g. T waves; and
 - h. isoelectric line.

Recommended time: 4 hours

SECTION 5 – RHYTHM RECOGNITION

Note to Instructors: Rhythms are divided into two main categories – core (those which must be taught to enable EMT-III personnel to perform the scope of activities outlined in 7 AAC 26.040 (Scope of Certified Activities)) and optional (those that may be taught if the number of class hours is increased commensurately).

At the completion of this section, the student will be able to:

Core Rhythms:

- a. normal/regular sinus rhythm (NSR/RSR);
 - b. sinus bradycardia;
 - c. sinus tachycardia;
 - d. ventricular tachycardia
 - e. ventricular fibrillation;
 - f. asystole;
 - g. pulseless Electrical Activity (PEA);
 - h. premature Ventricular Complexes (PVCs);
 - i. third degree AV block (complete heart block);
 - j. agonal rhythm; and
 - k. pacemaker rhythms.
- 5.1 Describe the rules for interpreting the etiology and clinical significance for the core ECG rhythms.
 - 5.2 Identify the core ECG Rhythms when given a representative ECG strip.
 - 5.3 List the basic life support and advanced life support treatment protocols for the core cardiac rhythms given a case scenario and a rhythm strip.

Recommended time: 8 hours

Optional Rhythms

- a. paroxysmal supraventricular tachycardia (PSVT);
 - b. atrial flutter;
 - c. atrial fibrillation;
 - d. first degree AV block;
 - e. second degree AV block, Type I (Wenkebach)
 - f. second degree AV block, type II (Mobitz, Type II);
 - g. idioventricular rhythm; and
 - h. junctional rhythm.
- 5.4 Describe the rules for interpreting the etiology and clinical significance for the optional ECG rhythms.
- 5.5 Identify the optional ECG rhythms when given a representative ECG strip.
- 5.6 List the basic life support and advanced life support treatment protocols for the optional cardiac rhythms given a case scenario and a rhythm strip.

Recommended time: 4 hours

SECTION 6 – CARDIAC PATIENT ASSESSMENT

Upon the completion of this section, the student will be able to:

- 6.1 List at least five signs and or symptoms that may be present in a patient who is having a myocardial infarction.
- 6.2 Identify, in a list of common prescription drugs, those that a patient may be taking for cardiovascular problems.
- 6.3 Describe those aspects of the physical examination that should be given special attention in the patient with suspected cardiac problems.
- 6.4 Describe the significance of the following physical exam findings in a cardiac patient:
 - a. altered level of consciousness;
 - b. peripheral edema;
 - c. cyanosis;
 - d. cool, clammy, skin;
 - e. jugular vein distension;
 - f. pulmonary crackles/wheezes;
 - g. pulse irregularity.
- 6.5 Explain the significance of listening to lung sounds in a patient with respiratory or cardiac complaints.
- 6.6 Discuss the important components that must be identified in taking an appropriate history from a patient, including SAMPLE and OPQRST.
- 6.7 Discuss and differentiate between a “stable” and an “unstable” cardiac patient using the American Heart Association recommendations.
- 6.8 Complete a history on a simulated patient with chest pain using the OPQRST and SAMPLE history formats.
- 6.9 Describe the relationship that time may have on infarct size when blood flow is compromised to the heart muscle.
- 6.10 Demonstrate the physical exam on a simulated patient with chest pain.
- 6.11 Identify the following upper airway sounds:
 - a. stridor;
 - b. gurgling; and
 - c. snoring.
- 6.12 Identify the following lower airway sounds:
 - a. crackles;
 - b. wheezes;
 - c. silent chest; and
 - d. normal lung sounds.
- 6.13 Discuss the medical significance of each of the above listed seven respiratory sounds.

Recommended time: 4 hours

SECTION 7 –CARDIOVASCULAR DISORDERS

At the conclusion of this section, the student will be able to:

- 7.1 Identify common causes and state signs and/or symptoms for each of the following conditions:
 - a. acute myocardial infarction (AMI);
 - b. pulmonary edema;
 - c. cardiogenic shock;
 - d. syncope;
 - e. myocardial trauma;
 - f. hypertension; and
 - g. angina.
- 7.2 Given case scenarios, demonstrate the BLS and ALS treatment for the following medical conditions:
 - a. acute myocardial infarction (AMI);
 - b. pulmonary edema;
 - c. cardiogenic shock;
 - d. syncope;
 - e. myocardial trauma;
 - f. hypertension; and
 - g. angina.
- 7.3 Given a case history, discuss the management of the traumatic cardiac arrest patient.
- 7.4 Given a case history, demonstrate the management of a cardiac arrest patient.
- 7.5 Describe why the following signs and symptoms occur in patients with cardiac problems:
 - a. chest pain or discomfort;
 - b. shoulder, arm, neck, or jaw pain/discomfort;
 - c. dyspnea;
 - d. syncope; and
 - e. palpitation/ abnormal heart beat.

Recommended time: 8 hours

SECTION 8 – PATIENT MANAGEMENT

At the conclusion of this section, the student will be able to:

- 8.1 For each of the following medications, state the generic and trade names, classification, indications, contraindications, precautions, medication form(s), dose, administration action, side effects and re-assessment strategies:
 - a. epinephrine autoinjector (patient assisted);
 - b. metered-dose inhaler (patient assisted);
 - c. oral glucose;
 - d. activated charcoal;
 - e. naloxone;
 - f. D₅₀W;
 - g. D₂₅W;
 - h. atropine;
 - i. epinephrine 1:1,000;
 - j. epinephrine 1:10,000;
 - k. lidocaine;
 - l. aspirin;
 - m. morphine; and
 - n. nitroglycerin.
- 8.2 Perform a subcutaneous (SQ) and intramuscular injection (IM) on a person.
- 8.3 Discuss the medications included in the EMT-II scope of certified activities that can be given by the SQ and IM routes.
- 8.4 Describe the layers of the skin, specifically:
 - a. epidermis and dermis (cutaneous);
 - b. superficial fascia (subcutaneous); and
 - c. deep fascia.
- 8.5 Describe, compare, and contrast the various drug administration routes and recall the indications for each (e.g. SL, IV, SQ, IM, inhalation, and IO).
- 8.6 Describe the indications, equipment needed, techniques used, precautions and general principles of administering medications by SQ and IM routes.
- 8.7 Describe potential complications which can occur with SQ and IM route.
- 8.8 Discuss how to prevent and/or treat potential complications that could result from SQ and IM routes.
- 8.9 Demonstrate the proper technique for the SQ and IM routes.
- 8.10 Integrate pathophysiological principles of medication administration with patient management.
- 8.11 Perform an aseptic intravenous (IV) cannulation on a person using an over-the-needle cannula device (“safe needle design”), IV solution, and IV tubing, setting the flow rate according to a given order.
- 8.12 Demonstrate the correct use of a manual defibrillator on a manikin, actually delivering a shock to a defibrillation manikin/simulator.

- 8.13 Describe the procedures for assuming responsibility for a cardiac arrest when AED trained personnel have begun care.
- 8.14 Describe the prerequisites for terminating resuscitation in accordance with state law.
- 8.15 Describe the procedures which may be performed, and which may be withheld, in accordance with applicable state and local Do Not Resuscitate statute, regulations, ordinances, policies, and procedures.
- 8.16 Direct bystanders in correct basic life support procedures during an arrest situation.
- 8.17 Discuss the management of a hypothermic patient in cardiac arrest, given a case scenario of hypothermia, according to the *Cold Injuries Guidelines*.
- 8.18 Describe appropriate post-resuscitation treatment.
- 8.19 Discuss patient management when transport time is prolonged.

Recommended hours: 8 hours

SECTION 9 – COMPREHENSIVE SKILLS AND KNOWLEDGE REVIEW

At the completion of this section, the student will be able to:

- 9.1 State the appropriate history questions and examination procedures, when given a scenario of a patient with each of the following medical conditions:
 - a. anaphylaxis;
 - b. isolated extremity pain; and
 - c. chest pain.
- 9.2 State the appropriate treatment, when given a scenario of a patient with each of the following medical conditions:
 - a. anaphylaxis;
 - b. isolated extremity pain;
 - c. chest pain; and
 - d. cardiac arrest in the setting of hypothermia.
- 9.3 State the appropriate treatment, when given a scenario involving a patient with chest pain and each of the following ECG rhythms:
 - a. premature ventricular contractions;
 - b. sinus bradycardia with PVC's;
 - c. supraventricular tachydysrhythmias;
 - d. heart blocks; and
 - e. perfusing ventricular tachycardia.
- 9.4 Review the following procedures:
 - a. basic life support;
 - b. placement of an advanced airway device approved by the medical director;
 - c. pharmacotherapy indications and sequence; and
 - d. defibrillation.

Recommended hours: 10 hours

SECTION 10 – COURSE FINAL WRITTEN AND PRACTICAL EVALUATION

At the completion of this section, the student will be able to:

- 10.1 Complete course practical evaluation.
- 10.2 Complete course written evaluation.

Recommended time: 3 hours

EXAMPLE COURSE SCHEDULE FOR EMT-III

The sample course outline below is based on a fifty-hour course format. Before the course, students should spend time focusing on the areas of Medical Terminology, State Skill Sheets, and Anatomy/Physiology. Students can draw the information to study these areas from the *State of Alaska Skill Sheets, Alaska Prehospital Trauma Guidelines, Cold Injury Guidelines*. Please note that the following is a sample outline and may be modified to better suit the needs of the instructor and student. It may be broken into logical blocks for instruction over a different length of time, for example, four hours per night on weekday and eight hours on Saturdays.

COURSE OUTLINE:

	<u>Time</u>	<u>Topics</u>
Day 1	0800-0830	Confirmation that students meet course eligibility requirements (not included in 50 hours)
	0830-1000	Course Pretest and Skills Sheet Testing (not included in 50 hours)
	1000-1030	Roles and Responsibilities
	1030-1100	EMS Systems
	1100-1200	Airway Management Skills (not included in 50 hours)
	<u>1200-1300</u>	<u>Lunch</u>
	1300-1700	Cardiovascular Anatomy and Physiology
Day 2	0800-1200	Basic Electrophysiology and Electrocardiology
	<u>1200-1300</u>	<u>Lunch</u>
	1300-1700	Rhythm Recognition
Day 3	0800-1200	Rhythm Recognition (cont.)
	<u>1200-1300</u>	<u>Lunch</u>
	1300-1700	Cardiac Patient Assessment

Course Outline – Cont.

Day 4	0800-1200 <u>1200-1300</u> 1300-1700	Cardiovascular Disorders <u>Lunch</u> Cardiovascular Disorders
Day 5	0800-1200 <u>1200-1300</u> 1300-1700	Patient Management <u>Lunch</u> Patient Management
Day 6	0800-1200 <u>1200-1300</u> 1300-1700	Comprehensive Skills and Knowledge Review <u>Lunch</u> Comprehensive Skills and Knowledge Review
Day 7	0800-1000 1000-1200 <u>1200-1300</u> 1300-1400 1400-1700	Comprehensive Skills and Knowledge Review EMT I/II Skills Review (not included in 50 hours) <u>Lunch</u> EMT I/II Skills Review (not included in 50 hours) Course Final and Written Practical Evaluation
Day 8	0800-1200 <u>1200-1300</u> 1300-1700	State EMT-III Written and Practical Testing <u>Lunch</u> State EMT-III Written and Practical Testing

Recommendations

1. DRUGS included in course:
 - a) atropine;
 - b) epinephrine 1:1,000;
 - c) epinephrine 1:10,000;
 - d) morphine sulfate;
 - e) lidocaine;
 - f) naloxone HCl;
 - g) metered-dose inhalers;
 - h) aspirin (ASA)
 - i) D₅₀W;
 - j) oxygen;
 - k) IV fluids;
 - l) nitroglycerin; and
 - m) epinephrine autoinjectors.
2. All students must successfully complete the skills sign off sheet to complete the course.