

THE MARYLAND

CARDIAC RESCUE TECHNICIAN PROGRAM STANDARDS

Division of Emergency Medical Services  
Maryland Department of Health and Mental Hygiene

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Basic Standards. For a CRT program to be operated successfully in any area of Maryland, several elements of the local program must be in place. They are:

1. One or more participating physicians who, working with the cooperating hospital(s), agree to assume the physician responsibilities in the local CRT program, including training, provision of orders and direction to the CRT in the field, and case review and skills maintenance of the CRT's in the area.

2. One or more cooperating hospitals that have agreed to participate in the program by providing:

- a) A clinical site for CRT training and skills maintenance.
- b) The ability to provide medical direction from the hospital or other appropriate center to the CRT in the field by radio communication at any time (i.e. 24 hrs/day, 365 days/year) that it is required.

3. Ambulances(s) manned by CRT's trained and certified in accordance with the standards specified in this document.

4. Ambulance(s) and hospitals equipped with the necessary medical and communications equipment to properly operate a CRT program. Further clarification is to exist in the future on medical equipment maintenance on the ambulances.

The Division of Emergency Medical Services will recognize ONLY those CRT programs that have all of these four elements in place or specifically planned for and will approve and provide funding and other support ONLY to those CRT training courses that are conducted in

INTRODUCTION

Maryland has been one of the national leaders in the development of advanced pre-hospital cardiac care techniques and the utilization of advanced paramedical skills on the part of ambulance attendants. The programs in Maryland have been constructed through initiatives taken by local ambulance and rescue units, physicians, the Maryland Heart Association and its affiliates, local cooperating hospitals, and the local governments in these areas.

In Maryland, as an outgrowth of these beginnings, the ambulance attendant who is trained in these advanced techniques is called a "Cardiac Rescue Technician" (CRT). The CRT is trained to recognize cardiac difficulties and, operating under a physician's direction, to monitor cardiac patients, administer drugs and intravenous solutions and defibrillate. Maryland law requires that CRT's be examined and certified on a periodic basis by the Maryland Board of Medical Examiners before they are allowed to apply their skills.

It is the intention of the Division of Emergency Medical Services to maintain a unified CRT program throughout the State, with standardized training programs, skills maintenance, and certification methods. In developing the standards described in this document, the Division of Emergency Medical Services has collaborated with the Board of Medical Examiners to achieve this goal.

accordance with the CRT Training Guidelines specified herein or have received written authorization from the Director of the Division of Emergency Medical Services for specified deviations from said Guidelines.

Further, the Board of Medical Examiners has indicated that they will accept for examination ONLY those CRT candidates who are involved in an approved local CRT program that contains these four essential elements.

The remainder of this document describes the standardized Maryland Cardiac Rescue Technician (CRT) Program. It includes:

1. Eligibility requirements to enroll in an approved Maryland Cardiac Rescue Technician Training Program.
2. Requirements to achieve and maintain certification as a Maryland Cardiac Rescue Technician.
3. The standard Maryland Cardiac Rescue Technician Training Program Course Guidelines.
4. Non-Physician Cardiac Rescue Technician Instructor Certification.

1. Minimum Cardiac Rescue Technician Qualifications

Maryland law requires that Maryland Cardiac Rescue Technicians (CRT's) be initially certified as CRT's by the Maryland Board of Medical Examiners, and be recertified by the Board on a periodic basis. In addition, the Maryland CRT must maintain skills during his period of certification by meeting certain annual performance minimums. Thus, the four steps in obtaining and maintaining CRT certification in Maryland are:

- (1) Receiving CRT training.
- (2) Obtaining initial CRT certification.
- (3) Meeting annual performance requirements.
- (4) Obtaining an annual CRT recertification.

The minimum qualifications for each step are given in Sections 1.1 through 1.3 below.

1.1 To become a CRT candidate and be eligible for enrollment in a CRT training program leading to initial CRT certification, a person must:

- 1.1.1 Be at least eighteen (18) years of age.
- 1.1.2 Have had at least one full year of continuous experience in providing emergency medical care as an ambulance attendant immediately prior to enrollment in the CRT course, or have had three hundred (300) ambulance runs during the year prior to enrollment.

NOTE: Serving for one year as an active member of a

paid or volunteer ambulance unit shall satisfy this requirement. Records of performance will be required.

- 1.1.3 Be currently certified as a Maryland Emergency Medical Technician (EMT).

AND

be currently certified by the Maryland Heart Association in Basic Life Support procedures for Cardiopulmonary Resuscitation and Emergency Cardiac Care. The Division will include a 4-5 hour modular time session into the CRT course to review CPR by requiring CRT candidates to produce a satisfactory strip recording performed on a Resusci-Anne as part of the skills check-off.

- 1.2 To become initially certified as a Maryland Cardiac Rescue Technician, a person must:

- 1.2.1 Meet all applicable CRT candidate qualifications, specified in Section 1.1

AND

- 1.2.2 Pass the CRT examination given by the Maryland Board of Medical Examiners with a score of at least seventy-five (75) per cent.

- 1.2.3 If a candidate fails the examination, he/she must repeat the didactic portion of another CRT course before retaking the exam. Failure to pass the 2nd exam requires a candidate to acquire an additional year's experience as an EMT in an ambulance company. After one year, a candidate must complete another entire CRT course before he/she is

eligible for examination. Failure to pass this exam will result in permanent exclusion from the CRT program.

1.3 To maintain certification during the annual period before recertification as a Maryland CRT, a CRT must:

1.3.1 Keep the EMS Regional Office currently informed of his address and company affiliation and will notify the office within thirty days (30), in writing, of any change in status, so that he remains an active member in good standing with an ambulance company.

1.3.2 In each annual period, administer at least 20 intravenous solutions to patients at the scene of an emergency or demonstrate proficiency in intravenous skills to a CRT-Instructor.

1.3.3 In each annual period, perform each of the following:

1.3.3.1 Monitor at least 10 patients having cardiac arrhythmias.

1.3.3.2 Defibrillate at least 5 patients or demonstrate competency at defibrillation on training manikins.

1.3.3.3 Administer parenteral drugs to at least 6 patients or training manikins.

1.3.3.4 Demonstrated proficiency in the use of the Esophageal Obturator Airway before a CRT-Instructor and/or insert Obturator three (3) times in 1-year's field experience.



These actions may be performed at the scene of an emergency, enroute to a Maryland hospital or under direct supervision in a Maryland hospital, clinic or training facility. Where training manikins are used, the actions must be under the direct supervision of a physician or certified CRT-Instructor, and may be a portion of the local case review program required in Section 1.3.4 below.

1.3.4 Participate in a local case review and continuing education program conducted on a regular basis by the physician and/or CRT-Instructor providing directions and supervision of CRT activity in the local area.

This program shall, as a minimum:

1.3.4.1 Review actual cases involving CRT care.

1.3.4.2 Review basic CRT course material, including arrhythmia pattern recognition.

1.3.5 Using forms (Appendix A) provided by the Division, report to the Director of the Division of Emergency Medical Services on an annual basis that he/she has met the performance requirements specified in Sections 1.3.1, 1.3.2, 1.3.3 and 1.3.4. On an annual basis, the Director shall recommend to the Board of Medical Examiners the revocation of certification for all CRT's who have failed to meet their performance minimums during the immediately preceding annual period.

1.3.6 Shall attend and successfully complete, within the annual period preceding recertification, a CRT refresher workshop approved by the Division of Emergency Medical Services. This workshop also serves to satisfy the needs for the Continuing Education Program.

NOTE: The Maryland Board of Medical Examiners will, as required by law, recertify each Maryland CRT who has fulfilled the performance requirements specified in Sections 1.3.1, 1.3.2, 1.3.3 and 1.3.4 for the preceding 1 year and has successfully completed the workshop specified in Section 1.3.6. This recertification will be designated on the CRT's certification card. Each ambulance company will be held responsible for maintaining accurate and complete records.

## 2. Maryland Cardiac Rescue Technician Training Course Guidelines

To prepare persons for the Maryland Board of Medical Examiners initial CRT certification examination, the Division of Emergency Medical Services and the Board of Medical Examiners have adopted standards for a uniform statewide CRT training course. The CRT training course guidelines are specified below.

- 2.1 Performance Objectives. This section delineates the performance capabilities that are expected of the student upon completion of the CRT course.

- 2.1.2.3 Should avoid, while performing duties, engaging in personal habits (e.g. smoking) which increase the discomfort of patients.
  - 2.1.2.4 Should maintain control of his/her emotions especially when faced with stressful situations, should speak in a calm voice, and act in a planned, controlled manner.
  - 2.1.2.5 Should identify himself/herself to the patient and/or family.
  - 2.1.2.6 Should explain in a clear and understandable manner to the patient and/or family the procedures being performed.
  - 2.1.2.7 Should protect the patient from harmful environmental factors such as curious onlookers or harmful weather conditions.
  - 2.1.2.8 Should understand the capabilities and limitations of his/her skills as developed by his/her training and the capabilities and limitations of the available CRT equipment.
  - 2.1.2.9 Should show courtesy to all who come in contact with him/her during the course of the performance of his/her duties.
- 2.1.3 Knowledge and Skills. The student must demonstrate, in writing or recitation, the acquisition of basic

2.1.1. Functions. The student shall be able to describe, in writing or by recitation, the overall functions of a CRT, which are:

2.1.1.1. Prompt and efficient response to the call.

2.1.1.2. Identification of a patient in a suspect population.

2.1.1.3. Rendering essential life support as indicated.

2.1.1.4. Establishing and maintaining effective communications with a designated agency providing medical direction.

2.1.1.5. Administration of proper care to patient prior to transportation under the authorization of the designated agency.

2.1.1.6. Transportation of the patient under constant observation to a medical facility as directed by the designated agency.

2.1.2. Behavior. The student shall demonstrate and be able to describe, in writing or recitation, appropriate conduct of a CRT during the performance of his/her duties.

The CRT:

2.1.2.1. Should not knowingly cause harm to a patient by, his/her activity or by negligence.

2.1.2.2. Should conform to local dress codes as much as possible and be neat and clean in appearance.

knowledge and must demonstrate adequate skill in performing the actions required of a CRT. Each CRT applicant will present a skills proficiency card signed by an Instructor. The CRT must be able to:

2.1.3.1 Describe the basic anatomy and physiology of the respiratory and cardiovascular systems, including:

- (a) The systemic circulatory system.
- (b) Flow of blood through heart and lungs.
- (c) Exchange of gases in the lungs.
- (d) Cardiac blood supply.
- (e) Chambers and divisions of the heart.
- (f) Layers of heart muscle.
- (g) Location of major vessels and valves in the heart.
- (h) Location of right and left coronary arteries.

2.1.3.2 Describe the anatomy and function of the cardiac conduction system, including:

- (a) Normal cardiac cycle.
- (b) Regulation of heart rate.
- (c) Effect of nervous and hormonal influences on cardiac rhythm.
- (d) The physiologic effects on rhythm disturbance.

2.1.3.3 Describe the epidemiology and pathology of coronary artery disease, sudden death, myocardial infarction, angina, unstable angina and cardiac rhythm disturbances including:

- (a) The difference in history of chest pain, shortness of breath and syncope.
- (b) The pathophysiologic effect of arrhythmias in myocardial infarction.
- (c) The effect of early diagnosis and treatment of disturbances of cardiac rhythm upon the morbidity and mortality of heart disease, and the role that the CRT plays in that early diagnosis and treatment.
- (d) The pathophysiology of cardiac failure, pulmonary edema and cardiogenic shock and its treatment.

2.1.3.4 Identify from verbal or written description, slide presentation, oscilloscope pattern and paper tracings, the following, and to correlate with clinical findings:

- (a) Normal sinus rhythm
- (b) Sinus tachycardia

- (c) Sinus bradycardia
- (d) Sinus arrhythmia
- (e) Premature atrial contractions
- (f) Paroxysmal atrial tachycardia
- (g) Atrial flutter
- (h) Atrial fibrillation
- (i) Junctional rhythm
- (j) Junctional tachycardia
- (k) Premature ventricular contractions:  
multifocal, proximity to T wave and  
frequency.
- (l) Ventricular tachycardia
- (m) Ventricular fibrillation
- (n) Asystole
- (o) Atrioventricular block: 1st<sup>o</sup>, 2nd<sup>o</sup>,  
3rd<sup>o</sup> or complete heart block.
- (p) Paced rhythms
- (q) Accelerated ventricular rhythm
- (r) Electrocardiographic alterations  
secondary to myocardial infarction or  
ischemia, specifically in ST and T wave  
configuration...

2.1.3.5. Demonstrate proficiency in the collection and communication of information pertinent to:

- (a) Vital signs
- (b) Circulatory and respiratory status
- (c) Heart rhythm
- (d) Cardiac history.

2.1.3.6 Describe indications, contra-indications, action, dosage, route of administration and immediate side effects of the following drugs:

- (a) Oxygen
- (b) Atropine
- (c) Lidocaine
- (d) Epinephrine
- (e) Sodium bicarbonate.

2.1.3.7 Calculate and demonstrate the methods of measurement of the dosage of medications and intravenous solutions.

2.1.3.8 Demonstrate the techniques of intravenous cannulation and intramuscular injection including sublingual administration.

2.1.3.9 Demonstrate proficiency in Basic Life Support, adhering to the standards of the American Heart Association.

2.1.3.10 Demonstrate proficiency in Advanced Life Support, including:

- (a) Airway management and ventilation to include Esophageal Obturator Airway.



- (b) Cardiac monitoring.
- (c) Radio telemetry and/or Life Support-  
Ambulance radio communication.
- (d) Defibrillation.

2.1.3.11 Explain the responsibilities and limitations of the Cardiac Rescue Technician as defined by current state law.

2.2 Course Content. To properly achieve the performance objectives specified in Section 2.1, the CRT training program must, as a minimum, include the following:

- 2.2.1 The functions of the CRT during response to a call, identification of a patient in a suspect population, rendering essential life support, communication with medical authority, administration of care under physician direction, and transportation of the patient.
- 2.2.2 Appropriate behavior while performing duties as a Cardiac Rescue Technician.
- 2.2.3 Physiology of the respiratory and cardiovascular systems.
- 2.2.4 Anatomy of the heart and coronary circulation.
- 2.2.5 Regulation of normal cardiac rhythm.
- 2.2.6 Anatomy and function of the cardiac conducting system.
- 2.2.7 Epidemiology of coronary artery disease, myocardial infarction, and sudden death.

- 2.2.8 Pathology of coronary artery disease and myocardial infarction.
- 2.2.9 History taking, including:
  - (a) Differential diagnosis of chest pain.
  - (b) Shortness of breath.
  - (c) Angina.
  - (d) Syncope.
- 2.2.10 Mechanisms of disturbances in cardiac rhythm with emphasis on the effects of arrhythmias in myocardial infarction.
- 2.2.11 Impact of Coronary Care Units, Emergency Departments, and Mobile Life Support Units on the morbidity and mortality of heart disease, and the role of the CRT in the early diagnosis and treatment of disturbances in heart rhythm.
- 2.2.12 Identification of cardiac arrhythmias.
- 2.2.13 Basic understanding of ECG alterations produced by infarction and ischemia.
- 2.2.14 Physical Examination, including:
  - (a) Vital signs.
  - (b) Assessment of circulatory and respiratory status.
  - (c) Cardiac rhythm.
- 2.2.15 Pharmacology of advanced life support, as taught in CRT training program.

- 2.2.16 Technique and measurement of doses of medications for intravenous and intramuscular administration.
- 2.2.17 Treatment of disturbances in cardiac rhythm.
- 2.2.18 Operation and maintenance of equipment.
- 2.2.19 Medical-legal status of persons performing duties as CRT's.
- 2.2.20 CPR.
- 2.2.21 Esophageal Obturator Airway insertion.

NOTE: The Course Content given above has been ordered in the same sequence as the CRT performance objectives specified in Section 2.1. However, it is not intended that the course necessarily be given in the order listed, or that course be partitioned into the twenty-one discrete segments specified.

2.3 Course Length. The Division expects each CRT course offered to provide sufficient didactic and clinical hours to the student to achieve the performance objectives specified in Section 2.1. The hours required will depend upon class size, background of the students, amount of self-teaching techniques employed, nature of the clinical setting and other factors. The class size should be limited to provide effective instruction. Except for unusual circumstances, the following have been found to be the minimum required to properly prepare the student as a CRT:

2.3.1 Didactic -- 60 hours.

2.3.2 Clinical -- 80 hours.

2.4 Course Approval. To obtain approval by the Division of Emergency Medical Services and thereby be eligible for State funding and resource support, the agency or institution conducting a CRT training course shall:

2.4.1 Designate the physician who is the responsible course director, and agree to fill the class with students who meet the minimum qualifications specified in Section 1.1.

2.4.2 Agree to attempt to achieve all performance objectives specified in Section 2.1 for every student in the class.

2.4.3 Agree to construct the course curriculum in such a manner that, as a minimum, all subject matter specified in Section 2.2 is included somewhere within the course.

2.4.4 Agree that the course will be taught by a certified physician or non-physician CRT-Instructor.

2.4.4.1 The CRT-Instructor may designate other approved Health Care Professionals to assist in the teaching of the CRT training course.

### 3. Non-Physician Cardiac Rescue Technician Instructors

3.1 A Cardiac Rescue Technician is eligible to become a non-

physician CRT-Instructor candidate providing he/she meets

all of the following requirements:

3.1.1 Holds a valid current Maryland certification as an Instructor in the health care field. Other types of teaching credentials may be substituted for the above certification, at the discretion of the Director.

3.1.2 Holds a valid current Maryland certification as a Cardiac Rescue Technician and has held that certification for at least one full year.

3.2 Cardiac Rescue Technician Instructor Certification The

Director of the Division of Emergency Medical Services will certify a Cardiac Rescue Technician Instructor Candidate as a Cardiac Rescue Technician Instructor for a period of two years when the Candidate has:

3.2.1 Successfully completed a Cardiac Rescue Technician

Instructor's Course approved by the Division and

served a successful internship involving the teaching

of one didactic section of a CRT course under the

direction and with the approval of a physician

licensed in Maryland.

3.2.2 Following CRT-Instructor internship, each candidate

shall be subjected to a review/evaluation process which

will include presentation of course material, to certified

CRT-Instructors from at least 3 other jurisdictions. In

addition to the 3 CRT-Instructors, a physician CRT-Instructor

will be required to pass final judgement as to the

evaluation of the CRT-Instructor Candidate.

Following successful evaluation, the Cardiac Rescue Technician Instructor Candidate will be recommended for certification to the Director of the Division of Emergency Medical Services.

3.3 Cardiac Rescue Technician Instructor Recertification: The Director of the Division of Emergency Medical Services shall recertify each Cardiac Rescue Technician Instructor for a two-year period who:

3.3.1 Has satisfactorily participated in the teaching of at least one complete CRT course in the preceding year.

3.3.2 Has participated in a two-day training seminar session that will be provided by the Division of Emergency Medical Services on an annual basis.

4. Decertification of Cardiac Rescue Technicians: In order for CRT's to maintain certification, it is necessary to require both skill competency as well as adherence to a general code of professional conduct.

4.1 A CRT may be decertified if he/she fails to meet the annual performance recertification requirements as specified in Sections 1.3.1, 1.3.2, 1.3.3, 1.3.4, and 1.3.5.

4.1.1 A CRT who has been decertified as a result of not adhering to Section 4.1 may regain certification by completing an entire CRT course and passing the CRT examination.

4.2 Until such time that reciprocity is developed for Cardiac

Rescue Technician activities among neighboring states, Cardiac Rescue Technicians must restrict their activities to within the State of Maryland and under the direct supervision of a Maryland physician located in a Maryland medical facility. Failure to adhere to this stipulation will result in the revocation of an individual CRT's certification.

4.3 Professional or mental incompetency.

4.4 Fraudulent or deceptive procurement of a certification.

4.5 Conviction of a crime involving mental turpitude.

4.6 Abandonment of a patient.

4.7 Addiction to narcotics, habitual drunkenness or rendering professional services to a patient if the Cardiac Rescue Technician is intoxicated or under the influence of drugs.

4.8 Immoral conduct of the Cardiac Rescue Technician in the performance of his duties.

4.9 Willfully making and filing false reports or records in his performance as a Cardiac Rescue Technician.

4.10 Willfull omission to filing or recording or willfully impeding or obstructing a filing or recording or inducing another person to omit to file or record medical reports.

4.11 Failure to furnish details of a patient's ambulance medical records to physicians, hospitals or the Board of Medical Examiners upon proper request.

4.12 Any violations of Sections 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10 and 4.11 will be reviewed by Division of

Emergency Medical Services personnel who will make appropriate recommendations for action to the Board of Medical Examiners.