PENNSYLVANIA EMERGENCY HEALTH SERVICES COUNCIL

Your Voice In EMS

May 8, 2015

Martin Raniowski, Deputy Secretary of Health
Pennsylvania Department of Health
Health Planning and Assessment
8th Floor West, Health & Welfare Bldg.
625 Forster Street
Harrisburg, PA 17120-0701

Richard Gibbons, Director
Pennsylvania Department of Health
Bureau of EMS
Room 606 Health & Welfare Bldg.
625 Forster Street
Harrisburg, PA 17120-0701

Dear Deputy Secretary Raniowski and Director Gibbons:

The Pennsylvania Emergency Health Services Council's (PEHSC) Executive Committee met on Wednesday, May 6, 2015 and has approved the enclosed recommendation VTR 0515-01 and voted to formally submit it to the Secretary of Health for consideration.

Upon your review of the recommendation, should you have any questions or concerns regarding the specifics of the enclosed or wish to schedule a meeting, please contact Janette Swade, Executive Director at (717) 795-0740.

Sincerely,

David Jones

J. David Jones JAS
President

JDJ/JS/pm

Enclosures

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PENNSYLVANIA EMERGENCY HEALTH SERVICES COUNCIL
Your Voice In EMS

PEHSC

RECOMMENDATION FOR CONSIDERATION

Executive Committee Meeting Date: May 6, 2015

Subject: Final Recommendations for Critical Care Paramedic Project

VTR#: 0515-01 Committee/Task Force: Air Medical Task Force

☒Recommended Goal ☐Recommended Policy Change ☐Other:

Recommendation:

The Pennsylvania Department of Health should accept PEHSC's final recommendations to implement the expanded scope of practice for paramedics practicing on licensed air and critical care transport ambulances [a.k.a. Critical Care Paramedic] in Pennsylvania

Rationale [Background]:

The critical care paramedic program was initiated by the PEHSC Statewide Air Medical Task Force in March 2010. This project represents the first expanded scope of practice for paramedics in the history of Pennsylvania's EMS system.

The project was completed in three (3) phases and recommended educational requirements, competency evaluation, provider transition, scope of practice, resource typing, medications and statewide critical care protocols. The PEHSC board has previously approved, and the Department of Health has preliminarily accepted Phase I and II recommendations.

In the final phase of the project, the working group reviewed the program in its entirety with the BEMS Director to gain insight on the Department's regulatory authority in several areas of the proposed program. Based on this interpretation, several aspects of the program were revised:

- Clinical Practicum
- Competency Evaluation
- Continuing Education
- Transition to Critical Care Paramedic
- Reciprocity
- Medical Directors

Throughout the document, previously proposed "requirements" were re-designated to reflect "best practice recommendations," in order to maintain the highest program standards possible. The working group believes the program is now ready to transition from development to the operational phase and has indicated its willingness to continue to provide the Department with additional advice on any yet unidentified start-up issues.

Medical Review [Concerns]:
The PEHSC Medical Advisory Committee voted to concur with these final recommendations at their April 15, 2015 meeting. The MAC has also been integrally involved in reviewing the now published statewide critical care protocols.

Fiscal Concerns:
As identified in previous VTRs related to this project, it is not the vision of the working group for every ALS agency to develop a critical care transport service line. Given the significant capital and operating costs associated with providing high-quality critical care transport, it is incumbent upon any agency considering this service line to perform a market analysis and/or explore a strategic partnership with their local healthcare facilities to share the cost/benefit.

Educational Concerns:
The educational objectives for critical care expanded scope of practice have been established within the program document. At the Department's request, these objectives have been translated into a new course review checklist, to be used by the Department, in consultation with PEHSC, to approve critical care transport courses.

Plan of Implementation:
Following acceptance of these final recommendations, the Department should consider:

1. Publishing the recommended scope of practice and drug list in the Pennsylvania Bulletin.
2. Publishing an EMS Informational bulletin to provide the regulated community with information related to both critical care transport ambulance transport agencies *[28 Pa. Code §1027.39]* and expanded scope of practice *[28 Pa. Code §§1027.39(d) and 1027.40(f)]*.
3. Proceed to review and approval, in consultation with PEHSC, critical care transport educational programs.

The PEHSC Committee/Task Force offers consultation to the Department in regard to the content of this Vote to Recommend (VTR) and its attached documents. The PEHSC Committee/Task Force specifically offers staff or member support to participate in Department deliberations regarding this recommendation in an effort to convey committee/task force discussions.

Executive Committee Comments/Concerns:

Signed: DAVID Jones

President

Date 5-6-15

For PEHSC Use Only – PA Department of Health Response

Accept:____ Table:____ Modify:____ Reject:____

Comments:

Date of Department Response:______________

Establishing the Critical Care Paramedic In Pennsylvania

- Educational Standards
- Competency Verification
- Continuing Education
- Resource Typing
- Scope of Practice
- Drug List
- Medical Director Requirements

Developed by
Pennsylvania Emergency Health Services Council:
Statewide Air Medical Task Force

Final Approved Recommendations: May 6, 2015

Content

Executive Summary

This document describes standards recommended by the Pennsylvania Emergency Health Services Council to the Pennsylvania Department of Health to establish the Critical Care Paramedic in the Commonwealth. Given the scope of this project, recommendations were submitted in phases to the Department of Health for its consideration. Establishing the critical care paramedic represents the first significant scope of practice expansion for paramedic-level providers since the inception of advanced life support in Pennsylvania.

In Phase I of the project, we established educational standards, competency verification and continuing education standards for those paramedics who desire to practice at a critical care level.

In Phase II, we focused on those areas which make the critical care paramedic operational by defining a proposed scope of practice and statewide drug list for the critical care paramedic. We have also made recommendations related to best practices for physicians assuming the role of a critical care agency medical director. The role of the physician, while always a key component in EMS, takes on special significance in critical care due to complexity of the care provided to higher acuity patients. Critical care providers, whether nurses, paramedics or other healthcare professionals represent the best of their respective professions, but they can only provide optimal care when the agency medical director is prepared to guide and support their practice.

Early in the project the workgroup identified that critical care transport is not a one-size-fits-all proposition and has worked to define crew configurations and their associated capabilities through the use of "resource typing." This type of resource definition is familiar to most emergency services providers because it is based on the principles of resource management developed by the Federal Emergency Management Agency (FEMA).

In Phase III, the workgroup developed, in consultation with the PEHSC Medical Advisory Committee, statewide critical care protocols that address common patient care situations associated with high acuity transports. These protocols are design to complement the current statewide basic and advanced life support protocols. Phase III also provided PEHSC with the opportunity to work with the PA Department of Health, Bureau of EMS, to transition the project from the development phase to operational readiness.

Sincerely,

PEHSC Statewide Air Medical Taskforce
PEHSC Critical Care Transport Workgroup

Introduction

Critical care transport is the delivery of complex health care to patients experiencing acute life threatening conditions. This care is delivered using both aircraft and ground vehicles to patients in the prehospital setting and those who require interfacility transport to a higher level of care. In Pennsylvania, critical care transport is typically provided by highly experienced prehospital registered nurses (PHRN) and paramedics.

Purpose

This project establishes educational standards and an expanded scope of practice that will take the paramedic to the next level to permit these allied health professionals to function more effectively as part of the critical care transport team by establishing the Critical Care Paramedic in Pennsylvania.

Scope

Pennsylvania Department of Health possesses the statutory authority to create the critical care paramedic and authorize their practice on a licensed air or critical care transport ambulance service, or in other patient care settings authorized by the Department.

National Education Standards

In August, 1996, the *EMS Agenda for the Future* was published. This consensus document was developed by the National Association of EMS Physicians and the National Association of State EMS Directors with funding provided by the National Highway Traffic Safety Administration (NHTSA) and the Health Resources and Services Administration (HRSA).

Following the Agenda's publication, a conference of national EMS education leaders was convened by NHSTA. The resultant work product from this conference was the *EMS Education Agenda for the Future: A Systems Approach.* Based on guidance from the EMS education agenda, the following companion documents were published:

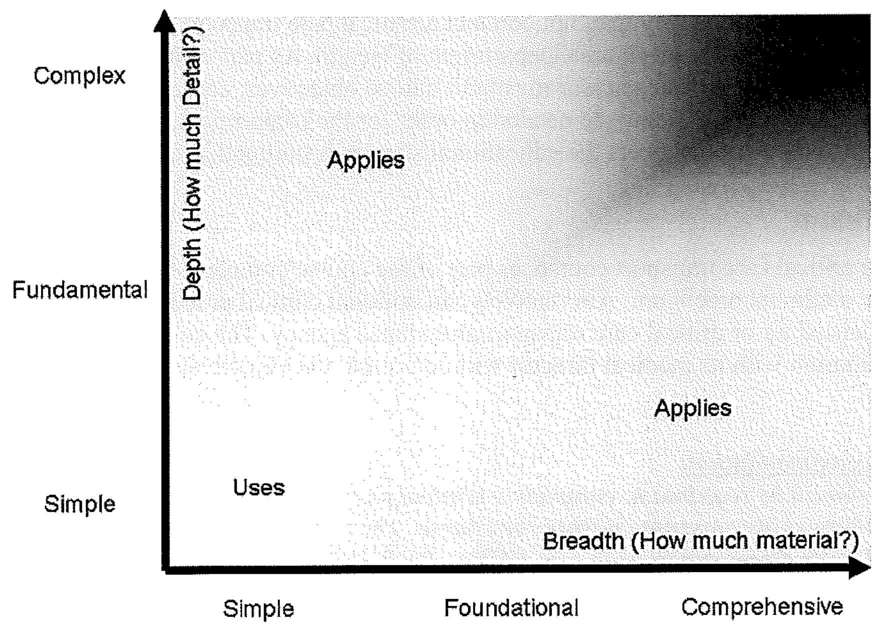
- *National EMS Core Content*
- *National EMS Scope of Practice*
- *National EMS Education Standards*

The *2009 National Education Standards* replaced the NHTSA National Standard Curricula at all levels. The standards define the competencies, clinical behaviors, and judgments that must be met by EMS personnel at all levels of practice. In developing standards for the critical care air/ground paramedic, the task force felt the integrity of the NHTSA document should be maintained, therefore the critical care paramedic standards are an extension of the federal document for Pennsylvania.

Education Standard Components

1. Competency (designated in yellow) – represents the minimum competency required for an entry-level provider at each level.
2. Knowledge Required to Achieve Competency (designated in blue) – represents an elaboration of the knowledge within each competency (when appropriate) that entry-level providers would need to master in order to achieve competency.
3. Clinical Behaviors/Judgments (designated in green) – describes the clinical behaviors and judgments essential for entry-level providers at each level.

The standards also assume there is a progression in practice from Emergency Medical Responder through Paramedic, and now the Critical Care Paramedic level. The descriptors used to illustrate the increasing complexity of knowledge and behaviors are expressed in terms of their "depth" and "breadth."



The *depth* of knowledge is the amount of detail a student needs to know about a particular topic. The *breadth* of knowledge refers to the number of topics or issues a student needs to learn in a particular competency. For example: the Emergency Medical Responder (EMR) needs to have a thorough understanding (depth) about how to safely and effectively use the bag-valve-mask device; however, the EMR is taught a limited number of concepts (breadth) surrounding airway management.[1]

To describe the intended depth of knowledge of a particular concept the terms *simple, fundamental, and complex* are used. This terminology better illustrates the progression of the depth of knowledge from one level to another. For example, the EMR's *depth* of knowledge for bleeding control is simple while the EMT's *depth* of knowledge for bleeding control is fundamental.

To describe the intended breadth of knowledge of a concept within a provider level, the terms *simple, foundational, and comprehensive* are used. This terminology also better illustrates the progression of the breadth of knowledge from one level to another. For example, the EMT's *breadth* of knowledge for cardiovascular disorders is foundational while the Paramedic's *breadth* of knowledge for cardiovascular disorders is comprehensive.

Course Design, Sponsorship and Approval Process

The design of the critical care transport course curriculum will be determined by the course sponsor and should be based on the student's intended practice environment, i.e. ground transport, air transport or both. If a paramedic takes a critical course designed for ground-based transport and later transitions to flight operations, they will be required to complete a bridge course for those flight specific topics. Within the educational standards section, topics required for the flight paramedic are identified with an (*).

Sponsors of a critical care transport course should be Department accredited advanced life support education institutions, licensed air or ground critical care transport agencies, hospitals or health systems

[1] 2009 NHTSA National EMS Education Standards

or institutions of higher learning. All course sponsors would be required to adhere to the same policies as DOH accredited EMS educational institutions with regard to course administration.

An educational institution or agency may not conduct a critical care transport course without first obtaining the approval of the Pennsylvania Department of Health. As part of its approval process the Department may require the course sponsor to submit course objectives, content outline, instructional guidelines or other information as may be needed in order for the Department, or its designee, to determine if the proposed course meets the educational standards outlined in this document.

Clinical Practicum

The sponsor of a critical care transport course, as part of the course completion requirements, has the option to include a clinical practicum. Alternatively, an optional clinical practicum may be conducted by a Department licensed air or critical care transport ambulance agency. The course sponsor or EMS agency, in consultation with its medical director will determine the objectives to be met during the practicum.

<u>Best Practice Recommendation:</u>
All paramedics should be required to complete a clinical practicum that is reflective of the psychomotor and critical thinking skills presented during the course. The paramedic should perform all expanded scope skills under the direct supervision of a PHRN, PHP, PHPE, FP-C, CCP-C or other appropriately licensed healthcare professional.

Competency Evaluation

The process to evaluate a student's entry-level mastery of the information presented in the critical care course will be the responsibility of the course sponsor. Each student should be required to successfully complete a cognitive exam and skills verification reflective of the material presented in the course

The EMS agency medical director is responsible to ensure the critical care paramedic demonstrates competency prior to authorizing an expanded scope of practice. This evaluation should be performed prior to granting practice privileges and then at least annually thereafter.

Expanded Practice Authority

The critical care paramedic is only permitted to utilize the approved expanded scope of practice when functioning on a licensed air or ground critical care transport ambulance. The EMS agency medical director has the authority to grant or restrict a paramedic's scope of practice while providing patient care on behalf of the EMS agency based on their review of the provider's knowledge and skills.

Continuing Education Requirements

The prescribed continuing education requirements for the critical care paramedic are EMS agency dependent; the EMS agency medical director is responsible to determine the required number of continuing education hours and/or core content.

The Department should accept, through an identified process, continuing education credits earned in critical care clinical topics towards the paramedic's Pennsylvania 27.0 hour bi-annual clinical/core con-ed requirement.

<u>Best Practice Recommendation:</u>
The critical care paramedic should obtain 50 hours of biannual continuing education in subjects related to critical care and/or critical care transport. Subject to Department approval, critical care continuing education hours may also be applied to the paramedic's biannual registration requirements.

Transition to Critical Care Paramedic

A paramedic who desires to obtain expanded scope of practice privileges to provide advanced care on behalf of a licensed air or ground critical care transport ambulance shall submit the following information to the EMS agency medical director for review:

OPTION 1: Documentation of successful completion of a Department approved course in critical care transport, or as an equivalent process;

OPTION 2: Evidence of current certification by the Board for Critical Care Transport Paramedic Certification (BCCTPC) as a Flight Paramedic (FP-C) or ground Critical Care Transport Paramedic (CCP-C).

Note: Any requirement for a paramedic to maintain BCCTPC certification as a FP-C or CCP-C is determined at the EMS agency level. See Appendix A for additional information about the BCCTPC and an exam content outline.

Reciprocity

A paramedic who seeks to practice in Pennsylvania as a critical care paramedic must complete the following process:

STEP 1: Complete the process established by the Department to obtain reciprocity as a Pennsylvania paramedic; and

STEP 2: Submit to the EMS agency medical director for review:

OPTION 1: Documentation of successful completion of a Department approved course in critical care transport; or

OPTION 2: Evidence of current certification by the Board for Critical Care Transport Certification as a Flight Paramedic (FP-C) or ground Critical Care Transport Paramedic (CCP-C).

Note: The Department may, at its discretion, require the applicant to submit additional documentation related to previous critical care transport education in order to determine if the course satisfies the educational objective describe in this document.

System Integration

An EMS Agency that operates a critical care transport ambulance service [or air ambulance service] employs one or more ALS [air]ambulances staffed by a crew capable of providing medical assessment, observation, triage, monitoring, treatment and transportation of patients who require EMS at the skill level needed to attend to and transport critically ill or injured patients between receiving facilities.

The minimum staffing for a critical care transport ambulance or air ambulance when responding to a call to provide critical care transport is an Emergency Medical Services Vehicle Operator (EMSVO) [Pilot] and two (2) EMS providers above the Advanced EMT (AEMT) level with at least one of the EMS providers being a Paramedic, Prehospital Registered Nurse (PHRN), Prehospital Physician Extender (PHPE) or Prehospital Physician (PHP) who has successfully completed a critical care transport educational program approved by the Department of Health.

When providing EMS through a critical care transport ambulance service or air ambulance service, the scope of practice for an EMS provider above the AEMT level will be expanded. This expansion will include EMS skills, the use of equipment in addition to those included in the EMS provider's general scope of practice if the EMS provider has received education to perform those skills and use that equipment by having successfully completed a critical care transport educational program approved by the Department of Health.

Source: Proposed Rulemaking 28 PA Code § 1027.36 - §1027.37

Based on their completion of a Department of Health approved critical care transport educational program and authorized expanded scope of practice, the Critical Care Paramedic meets the definition established by the Centers for Medicare and Medicaid Services (CMS) for SCT as it relates to a "paramedic with additional training."

CMS Definition: Specialty Care Transport (SCT)

> *"Specialty care transport (SCT) is the interfacility transportation of a critically injured or ill beneficiary by a ground ambulance vehicle, including the provision of medically necessary supplies and services, at a level of service beyond the scope of the EMT-Paramedic. SCT is necessary when a beneficiary's condition requires ongoing care that must be furnished by one or more health professionals in an appropriate specialty area, for example, emergency or critical care nursing, emergency medicine, respiratory care, cardiovascular care, or a paramedic with additional training."*
>
> *"The EMT-Paramedic level of care is set by each State. Care above that level that is medically necessary and that is furnished at a service level above the EMT-Paramedic level of care is considered SCT. That is to say, if EMT-Paramedics – without specialty care certification or qualification – are permitted to furnish a given service in a State, then that service does not qualify for SCT. The phrase "EMT-Paramedic with additional training" recognizes that a State may permit a person who is not only certified as an EMT-Paramedic, but who also has successfully completed additional education as determined by the State in furnishing higher level medical services required by critically ill or critically injured patients, to furnish a level of service that otherwise would require a health professional in an appropriate specialty area (for example a nurse) to provide. "Additional training" means the specific additional training that a State requires a paramedic to complete in order to qualify to furnish specialty care to a critically ill or injured patient during an SCT."*

Source: CMS Transmittal #68 – Effective January 1, 2007

Critical Care Transport Educational Standards

<table>
<tr><th></th><th>Paramedic</th><th>Critical Care Paramedic</th></tr>
<tr><td>Preparatory</td><td>Integrates comprehensive knowledge of EMS systems, the safety/well-being of the paramedic, and medical/legal and ethical issues which is intended to improve the health of EMS personnel, patients, and the community.</td><td>Expands previous upon knowledge of EMS systems by integrating a comprehensive understanding of critical care transportation, including those operations conducted by air or ground, and patient care environments that include both the prehospital and interfacility setting.</td></tr>
<tr><td>EMS Systems</td><td>AEMT Material PLUS:

Fundamental depth, foundational breadth:
History of EMS
Complex depth, comprehensive breadth:
EMS systems Roles/ responsibilities/professionalism of EMS personnel
Quality improvement
Patient safety</td><td>Paramedic Material PLUS:

Fundamental depth, foundational breadth:
History of critical care transport
Modes of critical care transport
Crew configurations
Prehospital v. Interfacility transports
Ethical considerations
Patient safety during transport
Provider knowledge/experience
Available resources
Medical Director support
Declination of transport for safety reasons
Education of facilities and physicians on safe transport practices</td></tr>
<tr><td>Research</td><td>AEMT Material PLUS:

Fundamental depth, foundational breadth:
Research principles to interpret literature and advocate evidence-based practice</td><td>Same As Previous Level</td></tr>
<tr><td>Workforce Wellness & Safety</td><td>AEMT Material PLUS:

Complex depth, comprehensive breadth:
Provider safety and wellbeing
Standard safety precautions
Personal protective equipment
Stress management
Dealing with death and dying
Prevention of work related injuries
Lifting and moving patients
Disease transmission
Wellness principles</td><td>Paramedic Material PLUS:

Fundamental depth, foundational breadth:
Rotary-wing and fixed-wing aircraft *
Crash and mishap avoidance *
Safety considerations in air-medical operations *
The atmosphere and gas laws *
Temperature
Pressure
Volume
Relative Mass
Boyle's Law
Dalton's Law
Charles' Law
Gay-Lussac's Law
Henry's Law
Graham's Law of Gaseous Diffusion
Stresses of Transport *
Hypoxia (review all types)
Barometric Pressure Changes
Thermal Changes
Decreased Humidity
Noise
Vibration
Fatigue
Gravitational Force
Spatial Disorientation
Flicker Vertigo
Fuel Vapors
Evolved gas disorders *</td></tr>
</table>

	Paramedic	Critical Care Paramedic
		• Pressurized and non-pressurized aircraft * • Altitude related disorders * • Flight tolerance of the ill and injured * * *Topics required for flight paramedic*
Documentation	**AEMT Material PLUS:** Complex depth, comprehensive breadth: • Principles of medical documentation and report writing	**Paramedic Material PLUS:** Fundamental depth, foundational breadth: • Documenting the critical care assessment • Supplemental documentation for reimbursement and operations
EMS System Communications	**AEMT Material PLUS:** Complex depth, comprehensive breadth: • EMS communication system and communication with other health care professionals • Team communication and dynamics	**Paramedic Material PLUS:** Fundamental depth, foundational breadth: • Flight following * • Communicating with ground providers * * *Topics required for flight paramedic*
Therapeutic Communications	**AEMT Material PLUS:** Complex depth, comprehensive breadth: Principles of communicating with patients in a manner that achieves a positive relationship: • Factors that affect communication • Interviewing techniques • Dealing with difficult patients • Adjusting communication strategies for age, stage of development, patients with special needs, and differing cultures	**Paramedic Material PLUS:** • Effective communications with family members
Medical-Legal Issues and Ethics	**AEMT Material PLUS:** Complex depth, comprehensive breadth: • Consent/refusal of care • Confidentiality • Advanced directives • Tort and criminal actions • Statutory responsibilities • Mandatory reporting • Health care regulation • Patient rights/advocacy • End-of-life issues • Ethical principles/moral obligations • Ethical tests and decision making	**Paramedic Material PLUS:** **Fundamental depth, foundational breadth** • End of life issues during interfacility transport
Anatomy and Physiology	**Integrates a complex depth and comprehensive breadth of knowledge of the anatomy and physiology of all human systems**	**Same as previous level w/ review and expansion on material relevant to critical care transport**
Medical Terminology	**Integrates comprehensive anatomical and medical terminology and abbreviations into the written and oral communication with colleagues and other healthcare professionals.**	**Same as previous level**
Pathophysiology	**Integrates comprehensive knowledge of pathophysiology of major human systems.**	**Same as previous level w/ review and expansion on material relevant to critical care transport**
Life Span Development	**Integrates comprehensive knowledge of life span development.**	**Same as previous level**
Public Health	**Applies fundamental knowledge of**	**Same as previous level**

	Paramedic	Critical Care Paramedic
	principles of public health and epidemiology including public health emergencies, health promotion, and illness and injury prevention.	
Pharmacology	**Integrates comprehensive knowledge of pharmacology to formulate a treatment plan intended to mitigate emergencies and improve overall health**	**Reviews and expands upon comprehensive knowledge of pharmacology at the paramedic level to include those medications commonly encountered during a critical care interfacility transport.**
Principles of Pharmacology	**AEMT Material PLUS:** Complex depth, comprehensive breadth: • Medication safety • Medication legislation • Naming • Classifications • Schedules • Pharmacokinetics • Storage and security • Autonomic pharmacology • Metabolism and excretion • Mechanism of action • Phases of medication activity • Medication response relationships • Medication interactions • Toxicity	**Paramedic Material PLUS:** Complex depth, comprehensive breadth: • Pharmacodynamics
Medication Administration	**AEMT Material PLUS:** Complex depth, comprehensive breadth: • Routes of administration • Within the scope of practice of the paramedic, administer medications to a patient	**Paramedic Material PLUS:** Complex depth and comprehensive breadth: • Use of intravenous infusion pumps
Emergency Medications	**AEMT Material PLUS:** Complex depth, comprehensive breadth: Within the scope of practice of the paramedic: • Names • Actions • Indications • Contraindications • Complications • Routes of administration • Side effects • Interactions • Dosages for the medications administered	**Paramedic Material PLUS:** Complex depth and comprehensive breadth: Medications commonly administered during a critical care transport, which may include, but not be limited to drugs in the following functional classifications: • Analgesics • Sedatives • Paralytics • Induction agents • Antiarrhythmics • Antianginals • Antihypertensives • Vasopressors • Thrombolytics • Bronchodilators • Antibiotics • Corticosteriods • Antiemetics • Diuretics • Insulin • Anticonvulsants • Anticoagulants • Anti-Platlet agents • Tocolytics • Prostaglandins • Parenteral nutrition

	Paramedic	**Critical Care Paramedic**
Airway Management, Respiration and Artificial Ventilation	**Integrates complex knowledge of anatomy, physiology, and pathophysiology into the assessment to develop and implement a treatment plan with the goal of assuring a patent airway, adequate mechanical ventilation, and respiration for patients of all ages.**	**Reviews and expands upon the comprehensive knowledge of airway management, respiration and artificial ventilation from the paramedic level to include advanced airway management and ventilation modalities that are associated with the critical care patient management.**
Airway Management	**AEMT Material PLUS:** Complex depth, comprehensive breadth: Within the scope of practice of the paramedic: • Airway anatomy • Airway assessment • Techniques of assuring a patent airway	**Paramedic Material PLUS:** Review of airway assessment and airway control techniques. Complex depth, comprehensive breadth: • Drug facilitated airway control (RSI) • Tracheostomy management • Airway control in special patient populations • Assessment and management of the difficult airway

Respiration	**AEMT Material PLUS:**
	
	Complex depth, comprehensive breadth:
	• Anatomy of the respiratory system
	• Physiology, and pathophysiology of respiration
	  ➢ Pulmonary ventilation
	  ➢ Oxygenation
	  ➢ Respiration
	    o External
	    o Internal
	    o Cellular
	• Assessment and management of adequate and inadequate respiration
	• Supplemental oxygen therapy
		Paramedic Material PLUS:
		
		Review anatomy, physiology, pathophysiology of respiratory system and focused assessment.
		
		Complex depth, comprehensive breadth:
		• Arterial blood gas interpretation and monitoring

Artificial Ventilation	**AEMT Material PLUS:**
	
	Complex depth, comprehensive breadth:
	Assessment and management of adequate and inadequate ventilation:
	• Artificial ventilation
	• Minute ventilation
	• Alveolar ventilation
	• Effect of artificial ventilation on cardiac output
		Paramedic Material PLUS:
		
		Complex depth, comprehensive breadth:
		• Mechanical ventilation
		  ➢ Principles of mechanical ventilation
		  ➢ Patient assessment for mechanical ventilation
		  ➢ Ventilator modes and parameters
		  ➢ Troubleshooting

Assessment	**Integrate scene and patient assessment findings with knowledge of epidemiology and pathophysiology to form a field impression. This includes developing a list of differential diagnoses through clinical reasoning to modify the assessment and formulate a treatment plan.**	**Expands upon the traditional paramedic-level assessment to include those techniques and parameters associated with a critical care setting. The critical care assessment includes an expanded physical assessment, use of diagnostic instruments and fundamental depth/foundational breadth interpretation of laboratory values and medical imaging.**

Scene Size-Up	**AEMT Material PLUS:**
	
	Complex depth, comprehensive breadth:
	• Scene management
	  ➢ Impact of the environment on patient care
	  ➢ Addressing hazards
	  ➢ Violence
	  ➢ Multiple patient situations
		Paramedic Material PLUS:
		
		Complex depth, comprehensive breadth:
		• Landing zone safety assessment *
		  ➢ Location
		  ➢ Size
		  ➢ Elevated obstructions
		  ➢ Ground level hazards
		* *Topics required for flight paramedic*

Primary Assessment	**AEMT Material PLUS:** Complex depth, comprehensive breadth:	**Same as previous level**

	Paramedic	Critical Care Paramedic
	• Primary assessment for all patient situations ➢ Initial general impression ➢ Level of consciousness ➢ ABCs ➢ Identifying life threats ➢ Assessment of vital functions • Integration of treatment/procedures needed to preserve life	
History Taking	**AEMT Material PLUS:** Complex depth, comprehensive breadth: • Components of the patient history • Interviewing techniques • How to integrate therapeutic communication techniques and adapt the line of inquiry based on findings and presentation	**Paramedic Material PLUS:** Fundamental depth, foundational breadth: • Differentiate between essential information in the prehospital and interfacility transport setting • Effectively communicating with other healthcare professionals involved in the transfer of care process
Secondary Assessment	**AEMT Material PLUS:** Complex depth, comprehensive breadth: Techniques of physical examination for all major • Body systems • Anatomical regions	**Same as previous level**
Monitoring Devices	**AEMT Material PLUS:** Fundamental depth, foundational breadth: Within the scope of practice of the paramedic: • Obtaining and using information from patient monitoring devices including (but not limited to): ➢ Continuous ECG monitoring ➢ 12 lead ECG interpretation ➢ Carbon dioxide monitoring ➢ Basic blood chemistry	**Paramedic Material PLUS:** Fundamental depth, foundational breadth: • Understanding of critical laboratory values • Using portable blood analysis devices • Understanding medical imaging ➢ Radiographs ➢ CT scans ➢ MRI ➢ Ultrasound Fundamental depth, foundational breadth: • Prehospital invasive vs. non-invasive pressure monitoring • Hemodynamic monitoring ➢ Arterial pressure monitoring ➢ Venous pressure monitoring o Triple lumen catheters o SCVO2 catheters o Pulmonary artery catheters • Invasive monitoring catheter/line management • Invasive pressure measurement ➢ Use of transducers ➢ Interpreting pressure measurements
Reassessment	**AEMT Material PLUS:** Complex depth, comprehensive breadth • How and when to perform a reassessment for all patient situations	**Same as previous level**
Medicine	**Integrates assessment findings with principles of epidemiology and pathophysiology to formulate a field impression and implement a comprehensive treatment/disposition**	**Builds upon the principles of pathophysiology and assessment findings used to formulate a field impression to understand the often complex medical problems encountered during the critical care interfacility transport.**

	Paramedic	Critical Care Paramedic
	plan for a patient with a medical complaint.	
Medical Overview	**AEMT Material PLUS:** Complex depth, comprehensive breadth: Pathophysiology, assessment, and management of medical complaints to include: • Transport & destination decisions	**Same as previous level**
Neurology	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of: Complex depth, comprehensive breadth • Stroke/intracranial • hemorrhage/transient ischemic attack • Seizure • Status epilepticus • Headache Fundamental depth, foundational breadth • Dementia • Neoplasms • Demyelinating disorders • Parkinson's disease • Cranial nerve disorders • Movement disorders • Neurologic inflammation/infection • Spinal cord compression • Hydrocephalus • Wernicke's encephalopathy	**Paramedic Material PLUS:** Review of anatomy, physiology, pathophysiology, neurological focused assessment and management. Fundamental depth, foundational breadth: • NIH stroke assessment tool • Use of thrombolytics Complex depth, comprehensive breadth: • Use of therapeutic hypothermia • Intracranial pressure monitoring
Abdominal and Gastrointestinal Disorders	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of: Complex depth, comprehensive breadth: • Acute and chronic gastrointestinal hemorrhage • Liver disorders • Peritonitis • Ulcerative diseases Fundamental depth, foundational breadth: • Irritable bowel syndrome • Inflammatory disorders • Pancreatitis • Bowel obstruction • Hernias • Infectious disorders • Gall bladder and biliary tract • disorders Simple depth, simple breadth: • Rectal abscess • Rectal foreign body obstruction • Mesenteric ischemia	**Paramedic Material PLUS:** Review of anatomy, physiology, pathophysiology, GI focused assessment and management. Fundamental depth, foundational breadth: • Management of enteral feeding devices • Management of drains • Management of vacuum closure devices • Altitude considerations * ** Topics required for flight paramedic*

	Paramedic	Critical Care Paramedic
Immunology	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of common or major immune system disorders and/or emergencies: Complex depth, comprehensive breadth: • Hypersensitivity • Anaphylactic reactions • Anaphylactoid reactions Fundamental depth, foundational breadth • Collagen vascular disease • Transplant related problems	**Same as previous level** Review of anatomy, physiology, pathophysiology, focused assessment and management.
Infectious Diseases	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, reporting requirements, prognosis, and management of: Complex depth, comprehensive breadth: • HIV-related disease • Hepatitis • Pneumonia • Meningococcal meningitis • Fundamental depth, • foundational breadth • Tuberculosis • Tetanus • Viral diseases • Sexually transmitted disease • Gastroenteritis • Fungal infections • Rabies • Scabies and lice • Lyme disease • Rocky Mountain Spotted Fever • Antibiotic resistant infections	**Paramedic Material PLUS:** Review of anatomy, physiology, pathophysiology, focused assessment, PPE/universal precautions and management. Complex depth, comprehensive breadth: • Use of antibiotics, antiviral and antifungal medications • Infections in special patient populations • The immuno-suppressed patient • Post exposure prophylaxis for the healthcare provider
Endocrine Disorders	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of: Complex depth, comprehensive breadth: • Acute diabetic emergencies • Diabetes Fundamental depth, foundational breadth: • Adrenal disease • Pituitary and thyroid disorders	**Same as previous level** Review of anatomy, physiology, pathophysiology, focused assessment and management. Complex depth, comprehensive breadth: • Types of insulin and administration technique • Correctable endocrine conditions , e.g. hypoglycemia, etc. • Adrenal insufficiency
Psychiatric	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of:	**Paramedic Material PLUS:** Review of anatomy, physiology, pathophysiology, psychiatric focused assessment and management. Complex depth, comprehensive depth:

	Paramedic	Critical Care Paramedic
	Complex depth, comprehensive breadth: • Acute psychosis • Agitated delirium Fundamental depth, foundational breadth: • Cognitive disorders • Thought disorders • Mood disorders • Neurotic disorders • Substance-related disorders /addictive behavior • Somatoform disorders • Factitious disorders • Personality disorders • Patterns of violence/abuse/neglect • Organic psychoses	• Air* and ground transport safety considerations • Use of physical and/or pharmacological restraint * *Topics required for flight paramedic*
Cardiovascular	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of: Complex depth, comprehensive breadth: • Acute coronary syndrome ➢ Angina pectoris ➢ Myocardial infarction • Heart failure • Non-traumatic cardiac tamponade • Hypertensive emergencies • Cardiogenic shock • Vascular disorders ➢ Abdominal aortic aneurysm ➢ Arterial occlusion ➢ Venous thrombosis • Aortic aneurysm/dissection, • Thromboembolism • Cardiac rhythm disturbances Fundamental depth, foundational breadth: • Infectious diseases of the heart ➢ Endocarditis ➢ Pericarditis • Congenital abnormalities	**Paramedic Material PLUS:** Review of anatomy, physiology, pathophysiology, cardiovascular focused assessment and management. Reinforce the importance of prehospital STEMI recognition through the use of 12-lead EKGs and the use of therapeutic hypothermia in post-resuscitation management. Complex depth, comprehensive breadth: • Electrophysiology Devices ➢ Pacemakers, including epicardial and transvenous • Cardiac Assist Devices ➢ LVAD and BiVAD ➢ Intra-Aortic balloon pump ➢ Extracorporeal membrane oxygenation • Management of mediastinal chest tubes
Toxicology	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of the following toxidromes and poisonings: Complex depth, comprehensive breadth: • Cholinergics • Anticholinergics • Sympathomimetics • Sedative/hypnotics • Opiates • Alcohol intoxication and withdrawal • Over-the-counter and prescription medications • Carbon monoxide	**Paramedic Material PLUS:** Review of anatomy, physiology, pathophysiology, toxicology assessment and management. Reinforce the importance of safety assessment, PPE and decontamination procedures prior to transport. Complex depth, comprehensive breadth • Intentional vs. unintentional poisoning • General management o Initial management o History taking and assessment o Symptoms of poisoning or toxic exposure o Physical exam o Laboratory studies • Removal, elimination or disruption of toxins • Supportive and emotional care • Safety issues during transport

	Paramedic	Critical Care Paramedic

	• Illegal drugs
	• Herbal preparations
		• Pharmacologic properties of drugs
		• Toxicity and treatment of poisoning by specific drugs
		  o Acetylsalicycic Acid
		  o Acetaminophen
		  o Antidepressents, i.e. Tricyclics
		  o Benzodiazepines
		  o Cardiac drugs, i.e. beta blockers, calcium channel blockers, digitalis, etc.
		  o Cocaine and other illicit drugs
		  o Hallucinogens
		  o Alcohol
		  o Ethylene Glycol
		  o Carbon Monoxide
		• Snakebites
		  o Recognition of venomous snakes
		  o Initial management
		  o Advanced treatment during transport

Respiratory	**AEMT Material PLUS:** Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, management of: Complex depth, comprehensive breadth: • Acute upper airway infections • Spontaneous pneumothorax • Obstructive/restrictive lung diseases • Pulmonary infections Fundamental depth, foundational breadth: • Neoplasm • Pertussis • Cystic fibrosis	**Same as previous level** Review of anatomy, physiology, pathophysiology, respiratory focused assessment and management, including use of CPAP and BiPAP devices.

Hematology	**AEMT Material PLUS:**
	
	Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of common or major hematological diseases and/or emergencies:
	
	Complex depth, foundational breadth:
	• Sickle cell disease
	Fundamental depth, foundational breadth:
	• Blood transfusion complications
	• Hemostatic disorders
	• Lymphomas
	• Red blood cell disorders
	• White blood cell disorders
	• Coagulopathies
		Paramedic Material PLUS:
		
		Review of anatomy, physiology, pathophysiology and focused assessment.
		
		Complex depth, comprehensive breadth:
		• Blood transfusions
		  ➢ Indications
		  ➢ Whole blood, blood components, and substitutes
		  ➢ Typing and compatibility
		  ➢ Pre-transfusion, concurrent, and post-transfusion assessment
		  ➢ Administration techniques
		  ➢ Management of transfusion complications
		  ➢ Documentation

Genitourinary/Renal	**AEMT Material Plus:**
	
	Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of:
	
	Complex depth, comprehensive breadth:
	• Complications of
	  ➢ Acute renal failure
	  ➢ Chronic renal failure
	  ➢ Dialysis
		Paramedic Material PLUS:
		
		Review anatomy, physiology, pathophysiology, focused assessment, and management
		
		Fundamental depth, foundational breadth
		• Insertion and management of a foley catheter
		• Management of:
		  o Renal replacement therapy
		  o Nephrostomy tubes
		  o Supra-pubic catheters

<table>
<tr><th></th><th>Paramedic</th><th>Critical Care Paramedic</th></tr>
<tr><td></td><td>➢ Renal calculi
Fundamental depth, foundational breadth:
• Acid base disturbances
• Fluid and electrolyte
• Infection
• Male genital tract conditions</td><td></td></tr>
<tr><td>Gynecology</td><td>AEMT Material Plus:

Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of common or major gynecological diseases and/or emergencies:

Complex depth, comprehensive breadth:
• Vaginal bleeding
• Sexual assault
Fundamental depth, foundational breadth:
• Infections
• Pelvic inflammatory disease
• Ovarian cysts
• Dysfunctional uterine bleeding
• Vaginal foreign body</td><td>Same as previous level

Review anatomy, physiology, pathophysiology, focused assessment, and management</td></tr>
<tr><td>Non-Traumatic Musculoskeletal</td><td>AEMT Material Plus:

Anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of common or major non-traumatic musculoskeletal disorders:

Fundamental depth, foundation breadth:
• Disorders of the spine
• Joint abnormalities
• Muscle abnormalities
• Overuse syndromes</td><td>Same as previous level

Review anatomy, physiology, pathophysiology, focused assessment, and management</td></tr>
<tr><td>Diseases of the Eyes, Ears, Nose and Throat</td><td>AEMT Material Plus:

Knowledge of anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis and management :

Fundamental depth, foundational breadth:
• Common or major diseases of the eyes, ears, nose, and throat, including nose bleed</td><td>Same as previous level

Review anatomy, physiology, pathophysiology, focused assessment, and management</td></tr>
<tr><td>Shock and Resuscitation</td><td>Integrates comprehensive knowledge of causes and pathophysiology into the management of cardiac arrest and peri-arrest states. Integrates a comprehensive knowledge of the causes and pathophysiology into the management of shock, respiratory failure or arrest with an emphasis on early intervention to prevent arrest.</td><td>Same as previous level</td></tr>
<tr><td>Trauma</td><td>Integrates assessment findings with principles of epidemiology and pathophysiology to formulate a field impression to implement a comprehensive treatment/disposition</td><td>Same as previous level</td></tr>
</table>

<table>
<tr><th></th><th>Paramedic</th><th>Critical Care Paramedic</th></tr>
<tr><td></td><td>plan for an acutely injured patient.</td><td></td></tr>
<tr><td>Trauma Overview</td><td>AEMT Material Plus:

Complex depth, comprehensive breadth:

Pathophysiology, assessment and management of the trauma patient:
• Trauma scoring
• Transport and destination issues</td><td>Same as previous level

Review pathophysiology, assessment and management of the trauma patient. Review and discuss trauma patient destination decisions relative to ground vs. air transport both in the prehospital and interfacility transport setting.</td></tr>
<tr><td>Bleeding</td><td>AEMT Material Plus:

Complex depth, comprehensive breadth:

Pathophysiology, assessment, and management of:
• Bleeding</td><td>Paramedic Material PLUS:
Review the pathophysiology and management of bleeding, including hemostatic agents and commercial tourniquets.

Complex depth, comprehensive breadth:
• DIC/coagulopathy
• Assessment and laboratory studies associated with the anti-coagulated patient
• Management of the anti-coagulated patient
  o Fresh frozen plasma
  o Vitamin K
  o Clotting factors</td></tr>
<tr><td>Chest Trauma</td><td>AEMT Material Plus:

Pathophysiology, assessment, and management of:

Complex depth, comprehensive breadth:
• Traumatic aortic disruption
• Pulmonary contusion
• Blunt cardiac injury
• Hemothorax
• Pneumothorax
➢ Open
➢ Simple
➢ Tension
• Cardiac tamponade
• Rib fractures
• Flail chest
• Commotio cordis
• Tracheobronchial disruption
• Diaphragmatic rupture
• Traumatic asphyxia</td><td>Paramedic Material PLUS:

Review pathophysiology, assessment and management of chest trauma.

Complex depth, comprehensive breadth:
• Management of chest tubes</td></tr>
<tr><td>Abdominal and Genitourinary Trauma</td><td>AEMT Material Plus:

Complex depth, comprehensive breadth:

Pathophysiology, assessment, and management of:
• Vascular injury
• Solid and hollow organ injuries
• Blunt versus penetrating mechanisms
• Evisceration
• Retroperitoneal injuries
• Injuries to the external genitalia</td><td>Paramedic Material PLUS:

Review pathophysiology, assessment and management of abdominal and genitourinary trauma.

Fundamental depth, foundational breadth:
• Understanding ultrasound images as part of the F.A.S.T exam</td></tr>
<tr><td>Orthopedic Trauma</td><td>AEMT Material Plus:

Pathophysiology, assessment, and management of :</td><td>Same as previous level

Review pathophysiology, assessment and management of orthopedic trauma, including use of commercial pelvic stabilization devices.</td></tr>
</table>

	Paramedic	Critical Care Paramedic
	Fundamental depth, foundational breadth: • Pediatric fractures • Tendon laceration/transection/ rupture (Achilles and patellar) • Compartment syndrome Complex depth, foundational breadth: • Upper and lower extremity orthopedic trauma • Open fractures • Closed fractures • Dislocations	
Soft Tissue Trauma	**AEMT Material Plus:** Complex depth, comprehensive breadth: Pathophysiology, assessment, and management of: • Wounds ➢ Avulsions ➢ Bite wounds ➢ Lacerations ➢ Puncture wounds • Burns ➢ Electrical ➢ Chemical ➢ Thermal • High-pressure injection • Crush syndrome	**Same as previous level** Review pathophysiology, assessment and management of soft tissue trauma. Complex depth, comprehensive breadth: • Management of crush syndrome Fundamental depth, foundational breadth: • Administration of tetanus immunization
Head, Facial, Neck and Spine Trauma	**AEMT Material Plus:** Pathophysiology, assessment, and management of : Fundamental depth, foundational breadth: • Unstable facial fractures • Orbital fractures • Perforated tympanic membrane Complex depth, comprehensive breadth: • Skull fractures • Penetrating neck trauma • Laryngeotracheal injuries • Spine trauma ➢ Dislocations/subluxations ➢ Fractures ➢ Sprains/strains	**Paramedic Material PLUS:** Review pathophysiology, assessment and management of head, facial, neck and spine trauma. Complex depth, comprehensive breadth: • Advanced management of spinal cord injuries
Nervous System Trauma	**AEMT Material Plus:** Pathophysiology, assessment, and management of: Fundamental depth, foundational breadth: • Cauda equina syndrome • Nerve root injury • Peripheral nerve injury Complex depth, comprehensive breadth • Traumatic brain injury • Spinal cord injury • Spinal shock	**Same as previous level** Review pathophysiology, assessment and management of nervous system trauma.
Special Considerations In	**AEMT Material Plus:**	**Same as previous level**

	Paramedic	Critical Care Paramedic
Trauma	Pathophysiology, assessment, and management of trauma in the: Complex depth, comprehensive breadth: • Pregnant patient • Pediatric patient • Geriatric patient • Cognitively impaired patient	Review pathophysiology, assessment and management of special patient population trauma.
Environmental Emergencies	**AEMT Material Plus:** Pathophysiology, assessment, and management of: Complex depth, comprehensive breadth: • Near-drowning • Temperature-related illness • Bites and envenomations • Dysbarism ➢ High-altitude ➢ Diving injuries • Electrical injury • High altitude illness	**Same as previous level** Review pathophysiology, assessment and management of environmental emergencies. Fundamental depth, foundational breath: • Suspension trauma
Multi-System Trauma	**AEMT Material Plus:** Pathophysiology, assessment, and management of: Complex depth, comprehensive breadth: • Multi-system trauma • Blast injuries	**Same as previous level** Review pathophysiology, assessment and management of multi-system trauma.
Special Patient Populations	**Integrates assessment findings with principles of pathophysiology and knowledge of psychosocial needs to formulate a field impression and implement a comprehensive treatment/disposition plan for patients with special needs**	**Builds on paramedic level assessment findings, pathophysiology, and psychosocial needs to effectively manage special patient populations in the prehospital setting and during interfacility transport.**
Obstetrics	**AEMT Material Plus:** Complex depth, comprehensive breadth: • Anatomy and physiology of pregnancy • Pathophysiology of complications of pregnancy • Assessment of the pregnant patient Psychosocial impact, presentations, prognosis, and management of: • Normal delivery • Abnormal delivery ➢ Nuchal cord ➢ Prolapsed cord ➢ Breech • Spontaneous abortion/miscarriage • Ectopic pregnancy • Eclampsia • Antepartum hemorrhage • Pregnancy induced hypertension • Third trimester bleeding ➢ Placenta previa	**Paramedic Material PLUS:** Review pathophysiology, assessment and management of obstetrical patients. Fundamental depth, foundational breadth • Fetal assessment • Fetal monitoring data • Ultrasound images related to ectopic pregnancy • Fetal heart rate abnormalities: o Variability o Periodic Changes o Acceleration (Variable, Early, Late, Sinusodal) o Bradycardia/Tachycardia • Contributing factors to fetal distress Complex depth, comprehensive breadth • Pre-eclampsia/eclampsia • Administration of tocolytics • Complications of pregnancy o Amniotic fluid embolism o Breech presentation o Post-partum hemorrhage o Uterine inversion

	Paramedic	Critical Care Paramedic
	➢ Abruptio placenta • High risk pregnancy • Complications of labor ➢ Fetal distress ➢ Pre-term ➢ Premature ruptured membranes ➢ Rupture of uterus • Complication of delivery • Post partum complications Foundational depth, foundational breadth: • Hyperemesis gravidarum • Post partum depression	○ Precipitous delivery ○ Retained placenta ○ Shoulder dystocia ○ Umbilical prolapse ○ Gestational diabetes ○ Placenta abruption ○ Placenta privia ○ Disseminated intravascular coagulation (DIC) ○ Multiple gestation ○ HELLP syndrome ○ Pre-term labor
Neonatal Care	**AEMT Material Plus:** Complex depth, comprehensive breadth: • Anatomy and physiology of neonatal circulation • Assessment of the newborn Presentation and management: • Newborn • Neonatal resuscitation	**Paramedic Material PLUS:** Review of anatomy, physiology, fetal circulation, assessment and resuscitation of the neonate. Complex depth, comprehensive breadth • Respiratory disorders, e.g. surfactant deficiency • Cardiac structural and flow abnormalities ○ Patent ductus arteriosm (PDA) ○ Patent foramen ovale (PFO) ○ Ventricular septal defect (VSD) ○ Tetrology of fallots ○ Transposition of the great vessels • Sepsis • Thermoregulation using an isolette • Critical neonate laboratory values
Pediatrics	**AEMT Material Plus:** Age-related assessment findings, age-related anatomic and physiologic variations, age related and developmental stage related assessment and treatment modifications of the pediatric-specific major or common diseases and/or emergencies: Complex depth, comprehensive breadth: • Foreign body (upper and lower) airway obstruction • Bacterial tracheitis • Asthma • Bronchiolitis ➢ Respiratory Syncytial Virus (RSV) • Pneumonia • Croup • Epiglottitis • Respiratory distress/failure/arrest • Shock • Seizures • Sudden Infant Death Syndrome (SIDS) • Hyperglycemia • Hypoglycemia Fundamental depth, foundational breadth: • Pertussis • Cystic fibrosis • Bronchopulmonary dysplasia • Congenital heart diseases • Hydrocephalus and ventricular shunts	**Same as previous level** Review age-related assessment findings, anatomic and physiologic variations, developmental stage related assessment and treatment modifications of the pediatric-specific major or common diseases and/or emergencies.
Geriatrics	**AEMT Material Plus:**	**Same as previous level**

	Paramedic	Critical Care Paramedic
	Normal and abnormal changes associated with aging, pharmacokinetic changes, psychosocial and economic aspects of aging, polypharmacy, and age-related assessment and treatment modifications for the major or common geriatric diseases and/or emergencies: Complex depth, comprehensive breadth: • Cardiovascular diseases • Respiratory diseases • Neurological diseases • Endocrine diseases • Alzheimer's • Dementia • Delirium ➢ Acute confusional state Fundamental depth, foundational breadth • Herpes zoster • Inflammatory arthritis	Review normal and abnormal changes associated with aging, pharmacokinetic changes, psychosocial and economic aspects of aging, polypharmacy, and age-related assessment and treatment modifications for the major or common geriatric diseases and/or emergencies.
Patients with Special Challenges	**AEMT Material Plus:** Complex depth, comprehensive breadth: Healthcare implications of: • Abuse • Neglect • Poverty • Bariatric • Technology dependent • Hospice/ terminally ill • Tracheostomy care/dysfunction	**Paramedic Material PLUS:** Complex depth, comprehensive breadth: • Air or ground medical transport of the bariatric patient * • Patients requiring specialty equipment and staffing support during interfacility transport. Fundamental depth, foundational breadth: • Pre-transport briefing of non-EMS caregivers • Weight and balance issues related to bariatric patients * * *Topics required for flight paramedic*
EMS Operations	**Same as Previous Level (EMR)** **Knowledge of operational roles and responsibilities to ensure safe patient, public, and personnel safety**	**Paramedic Material PLUS:** **Expands knowledge of EMS operations gained at previous levels by integrating the roles and responsibilities necessary to ensure the safe transport of critically ill or injured patients to specialty care receiving facilities. Includes the logistics involved in extended air or ground interfacility transports.**
Principles of Safely Operating a Ground Ambulance	**Same as Previous Level (EMR/EMT)** Simple depth, simple breadth • Risks and responsibilities of emergency response Simple depth, foundational breadth • Risks and responsibilities of transport	**Same as previous level**
Incident Management	**AEMT Material Plus:** Complex depth, comprehensive breadth • Establish and work within the incident management system	**Same as previous level**
Multiple Casualty Incidents	**Same as Previous Level (EMR/EMT)** Simple depth, simple breadth: • Triage principles • Resource management • Triage • Performing • Re-Triage	**Same as previous level**

	Paramedic	Critical Care Paramedic
	• Destination decisions • Post traumatic and cumulative stress	
Air Medical	**AEMT Material Plus:** Complex depth, comprehensive breadth: • Medical risks/needs/advantages	**Scope of this section is covered in other sections of the educational standards for the flight/ground critical care paramedic.**
Vehicle Extrication	**Same as Previous Level (EMR/EMT)** Simple depth, simple breadth: • Safe vehicle extrication • Use of simple hand tools	**Same as previous level**
Hazardous Materials Awareness	**Same as Previous Level (EMR/EMT)** Simple depth, simple breadth: • Risks and responsibilities of operating in a cold zone at a hazardous material or other special incident	**Same as previous level** Review risks and responsibilities of operating in a cold zone at a hazardous material or other special incident.
Mass Casualty Incident Due To Terrorism and Disaster	**Same as Previous Level (EMR/EMT)** Simple depth, simple breadth: • Risks and responsibilities of operating on the scene of a natural or man-made disaster	**Same as previous level** Review risks and responsibilities of operating on the scene of a natural or man-made disaster.

CLINICAL BEHAVIOR/ JUDGMENT	PARAMEDIC	Critical Care Paramedic
Assessment	Perform a comprehensive history and physical examination to identify factors affecting the health and health needs of a patient.	Gathers complex healthcare information from other healthcare providers to identify factors that may affect the patient's stability during transport.
	Formulate a field impression based on an analysis of comprehensive assessment findings, anatomy, physiology, pathophysiology, and epidemiology.	Performs an advanced level critical care assessment through a comprehensive patient assessment and interpretation of monitoring parameters, laboratory values and medical imaging.
	Relate assessment findings to underlying pathological and physiological changes in the patient's condition.	**Same as previous level**
	Integrate and synthesize the multiple determinants of health and clinical care.	**Same as previous level**
	Perform health screening and referrals.	**Same as previous level**
Therapeutic Communication and Cultural Competency	Effectively communicate in a manner that is culturally sensitive and intended to improve the patient outcome.	**Same as previous level**
Psychomotor Skills	Safely and effectively perform all psychomotor skills within the National EMS Scope of Practice Model AND state Scope of Practice at this level. Airway and Breathing: • Oral and nasal endotracheal intubation • FBAO – direct laryngoscopy • Percutaneous cricothyrotomy • Pleural decompression • BiPAP, CPAP, PEEP • Chest tube monitoring • ETCO2 monitoring • NG/OG tube Assessment: ECG interpretation: • 12-lead interpretation • Blood chemistry analysis Pharmacologic interventions: • Intraosseous insertion • Enteral and parenteral administration of approved prescription medications • Access indwelling catheters • and implanted central IV • ports • Medications by IV infusion • Maintain infusion of blood or blood products • Blood sampling • Thrombolytic initiation • Administer physician approved medications Medical/Cardiac Care: • Cardioversion • Manual defibrillation • Transcutaneous pacing • Carotid massage	In addition to those skills outlined in the National Scope of Practice Model and authorized by the Pennsylvania Department of Health for the paramedic, the flight or ground critical care paramedic can safely and effectively perform the following psychomotor skills: Airway and Breathing: • Drug facilitated airway control, i.e. RSI • Operation of mechanical transport ventilators • Use of all supra-glottic/alternative airways • Tracheostomy management Assessment & Monitoring: • Maintenance and access to invasive pressure monitoring devices and interpretation of monitoring parameter information • Interpretation of critical laboratory values • Arterial blood gas interpretation • Interpretation of medical imaging information • Interpretation of fetal monitoring data • Operation of portable blood analysis equipment Pharmacology: • Expanded administration of enteral and parenteral prescription medications as ordered by a physician or through an approved protocol • Infusion of blood, blood products or blood substitutes • Initiation and/or maintenance of thrombolytics Medical & Cardiac Care: • IABP monitoring • ECMO monitoring • VAD monitoring • Pacemakers • Feeding tube management • Foley catheter insertion/management

	Trauma care: • Morgan lens Anticipate and prospectively intervene to improve patient outcome.	Trauma Care: • Chest tube management • Drain management • ICP monitoring
Professionalism	Is a role model of exemplary professional behavior including: but not limited to, integrity, empathy, self-motivation, appearance/personal hygiene, self-confidence, communications, time management, teamwork/ diplomacy, respect, patient advocacy, and careful delivery of service.	**Same as previous level**
Decision Making	Performs basic and advanced interventions as part of a treatment plan intended to mitigate the emergency, provide symptom relief, and improve the overall health of the patient. Evaluates the effectiveness of interventions and modifies treatment plan accordingly.	**Same as previous level**
Record Keeping	Report and document assessment findings and interventions. Collect and report data to be used for epidemiological and research purposes.	**Same as previous level**
Patient Complaints	Perform a patient assessment, develop a treatment and disposition plan for patients with the following complains: abdominal pain, abuse/neglect, altered mental status/decreased level of consciousness, anxiety, apnea, ascites, ataxia, back pain, behavioral emergency, bleeding, blood and body fluid exposure, cardiac arrest, cardiac rhythm disturbances, chest pain, congestion, constipation, cough/hiccough, cyanosis, dehydration, dental pain, diarrhea, dizziness/vertigo, dysmenorrhea, dysphasia, dyspnea, dysuria, ear pain, edema, eye pain, fatigue, feeding problems, fever, GI bleeding, headache, hearing disturbance, hematuria, hemoptysis, hypertension, hypotension, incontinence, jaundice, joint pain/swelling, malaise, multiple trauma, nausea/vomiting, pain, paralysis, pediatric crying/fussiness, poisoning, pruritus, rash, rectal pain, red/pink eye, shock, sore throat, stridor/drooling, syncope, tinnitus, tremor, urinary retention, visual disturbances, weakness, and wheezing.	**Paramedic Material PLUS** Understands complex/multiple patient diagnosis's and is able to continue the patient's previously established plan of care during interfacility transport. Is able to assess new patient complaints during transport and formulate an appropriate treatment plan to abate life threats or significant pain and discomfort.
Scene Leadership	Function as the team leader of a routine, single patient advanced life support emergency call.	**Paramedic Material PLUS** Functions as a team member/leader of an interfacility critical care transport.
Scene Safety	Ensure the safety of the rescuer and others during an emergency.	**Paramedic Material PLUS** Ensures safety of ground providers, specialty team members and others involved with or exposed to aircraft operations.

Resource Typing

Resource typing is defined by the Federal Emergency Management Agency in FEMA 508-3, March 2009, as *"the categorization and description of resources that are commonly exchanged in disasters via mutual aid, by capacity and/or capability."* Within the FEMA standard, EMS resources are "typed" using metrics that describe a particular resource's overall function, personnel, capability and equipment and supplies.

Although FEMA does not have a specific typing definition for critical care transport, this concept was applied, in part, to differentiate the levels of critical care transport resources that may be tasked to perform an interfacility transport. Currently, a critical care transport crew is commonly thought of as a multidisciplinary team comprised of nurses, paramedics and healthcare professionals in an air or ground ambulance. In the future, crew configuration will be based on the patient's acuity and anticipated need for care during the transport. This is consistent with Pennsylvania's initiative to create a culture of EMS safety and is a positive step to ensure appropriate resource utilization.

The metrics used for resource typing in this project are:

1. Patient Acuity
2. Crew Configuration
3. Authorized Protocols and Formularies
4. DOH Licensing Requirements
5. Vehicle Type(s)

Based on these metrics, three (3) levels of critical care transport have been established ranging from the high-level multidisciplinary team to the traditional ALS ambulance crew who transport the low acuity patient that requires monitoring or care beyond the capability of a BLS ambulance.

Type I Team

- **Consists of (1) CCT-P and (1 or more) PHRN, PHP or PHPE or (2) PHRN, PHP or PHPE**
- **Includes patients who are unstable or are likely to become unstable during transport and/or requires care from a specialty team**
- **Uses DOH approved statewide ALS/BLS and critical care transport protocols and;**
- **Uses agency defined, DOH approved, critical care transport protocols**
- **Utilizes either an air or ground-based ambulance vehicle**
- **Requires licensing as air ambulance or critical care transport ambulance**

Type II Team

- **Consists of (2) CCT-Ps or (1) critical care paramedic and (1) ALS paramedic**
- **Includes transport of stable patients that require monitoring/interventions beyond the scope of the ALS paramedic**
- **Uses DOH approved statewide ALS/BLS protocols and;**
- **Uses DOH approved statewide critical care transport protocols (CCT-P only)**
- **Utilizes a ground-based ambulance**
- **Requires licensing as critical care transport ambulance**

Type III Team

- **Consists of at least (1) ALS paramedic**
- **Includes stable patients requiring monitoring/interventtions that are beyond the scope of a BLS provider, a.k.a typical "ALS Interfacility Transport"**
- **Uses DOH approved statewide ALS/BLS protocols**
- **Utilizes a ground based ambulance**
- **Requires licensing as ALS ambulance**

Scope of Practice

Area	Skill	CCT-P
Airway/ Ventilation	BiPAP acute or titrated	Yes
	Intubation – Initiation of Sedation/Neuromuscular Blockage (RSI)	Yes[1,2]
	Intubation – Maintenance of Previously Initiated Sedation/Neuromuscular Blockage	Yes[1]
	Intubation – Laryngeal Mask Airway	Yes
	Transport Ventilator, Multi-modal/Gas Blended - Acute	Yes
	Transport Ventilator, Multi-modal/Gas Blended - Titrated	Yes[2]
	Tracheostomy, Management of	Yes
Assessment	Blood Pressure, Invasive	Yes
	PA Catheter Monitoring	Yes[2]
	Intra-Aortic Balloon Pump, Monitoring/Assist	Yes[2]
	Thrombolytic Therapy, Initiation of	Yes[2]
	Thrombolytic Therapy, Monitoring of	Yes[2]
	Transvenous or Epicardial Pacing, Management of	Yes[2]
	Extracorporeal Membrane Oxygenation (ECMO), Management of	Yes[2]
	Invasive cardiac assist device, Management of	Yes[2]
	Ventricular Assist Device, Management of (Acute or VAD related complication)	Yes[2]
	Portable Blood Analysis Devices, Use of	Yes
	Blood Sampling from Central Venous Line	Yes
Management	Blood and Blood Products - Initiated	Yes[2]
	Blood and Blood Products - Continued	Yes[2]
	Dislocations, Reduction of	Yes[2]
	Intracranial Pressure Monitoring	Yes[2]
	Pulmonary Artery Catheter Monitoring	Yes[2]
	Per Approved Critical Care Agency Protocols	Yes[3,4]
	Tube Thoracotomy, Management of Existing	Yes
	Tube Thoracotomy, Placement or Management of recently placed	Yes[2]
	Wound Drainage Devices, Management of	Yes
	Enteral Feeding Devices, Management of	Yes
	Urinary Catheters, Insertion and Management of	Yes
	Indwelling Sub-cutaneous Catheter, Access Existing	Yes

Notes

1. Procedure that requires 100% QA review by agency medical director.
2. Restricted to CCT-P functioning with a PHRN, PHPE or PHP on higher level transport team.
3. Subject to DOH approval.
4. Only applies to licensed air ambulance agency.

Definitions

Acute:	Initiated or requiring significant change within 48 hours of transport.
Chronic:	Ongoing for greater than 48 hours of transport without anticipated need for titration.
Continued:	Established by the sending facility and continued by the CCT provider during transport.
Initiated:	Established by CCT provider under protocol or direct medical command.
Titrated:	Requiring adjustment within 30 minutes prior to transport to maintain patient stability.

Statewide CCT Drug List

In addition to the existing approved statewide ALS ambulance drug list, authority to administer additional medications is necessary for the critical care paramedic to provide higher level care.

Drug Class	Name	CCT-P
Analgesics:	1. Dilaudid	Yes[3]
	2. Ketorolac	Yes[1,2]
Sedatives:	1. Propofol	Yes[1,2]
	2. Ketamine	Yes[1,2]
Paralytics:	1. Non-Depolarizing Agents	Yes[1,2]
	2. Succinylcholine	Yes[2]
Anti-Hypertensives:	1. All Types (Not otherwise specified)	Yes[2]
	2. Hydralazine	Yes[1,2]
Volume Expanders:	1. Albumin	Yes[1,2]
	2. Blood Products	Yes[2]
	3. Dextran	Yes[1,2]
	4. Hespan	Yes[1,2]
	5. Plasmanate	Yes[1,2]
Vasopressors:	1. Milrinone	Yes[1,2]
	2. Norepinephrine	Yes[2]
	3. Phenylephrine	Yes[2]
Bronchodilators:	1. Metaproterenol	Yes[1,2]
	2. Theophylline	Yes[1,2]
Anti-Hypertensives:	1. Atenolol	Yes[1,2]
	2. Labetolol	Yes[1,2]
	3. Metoprolol	Yes[1,2]
	4. Propranolol	Yes[1,2]
Fibrinolytics/ Thrombolytics:	All Types	Yes[2]
Anti-Coagulants/ Anti-Platelets:	1. All Types (Not otherwise specified)	Yes[1,2]
	2. Bivalirudin	Yes[2,3]
	3. Clopidogrel	Yes[2]
	4. Heparin	Yes[2,3]
	5. Abciximab	Yes[2,3]
	6. Eptifibatide	Yes[2,3]
	7. Tirofiban	Yes[2,3]
Anti-Arrhythmics:	1. Digoxin	Yes[2,3]
	2. Esmolol	Yes[2]
	3. Quinidine Sulfate/Gluconate	Yes[2]
Anti-Convulsants:	1. Barbiturates	Yes[2]
	2. Other Non-Benzodiazepine Anti-Convulsants	Yes[2]
	3. Phenytoin/Phosphenytoin	Yes[1,2]
Electrolytes/ Electrolyte Solutions:	Potassium Chloride	Yes[2,3]
Diuretics:	Mannitol	Yes[2]
Steroids:	Glucocorticiods/Mineralcorticoids	Yes[1,2]
Anti-Emetics:	All Types (Not otherwise specified)	Yes[1,2]
Antidotes & Reversal	1. Antivenom	Yes[1,2]

Agents:	2. Hydroxocobalamin	Yes[1,2]
	3. Romazicon	Yes[2]
Prostaglandins:	All Types	Yes[2]
Tocolytics:	All Types (Not otherwise specified)	Yes[2]
Miscellaneous:	1. Insulin	Yes[2]
	2. Total Parenteral Nutrition	Yes[2,3]
	3. Medications not listed above but authorized by critical care agency medical director through agency-level protocol	Yes[4]

Notes:

1. CCT-P restricted to maintenance of medications initiated at sending facility.
2. CCT-P may initiate medication when functioning with PHRN, PHPE or PHP on higher level transport team.
3. Approved on current PA ALS drug list for maintenance during interfacility transport.
4. Air Ambulance only.

Medical Director Requirements

The medical director serves as the chief medical officer for an EMS Agency. In this role the physician performs a variety of tasks to ensure patient care is delivered in a timely, safe and competent manner. Although a medical director may delegate some of the more routine tasks to physician or non-physician subordinates, it is essential the physician be engaged as an integral part of the prehospital healthcare delivery system.

In critical care transport, the physician medical director's role takes on added significance due to patient acuity and the complex treatment modalities that must be undertaken in order to maintain the standard of care established by the sending facility. Critical care providers, whether nurses, paramedics or other healthcare professionals, represent the best of their profession, but can only provide optimal care when the agency medical director is prepared to guide and support their practice.

In Pennsylvania, the EMS Act (Act 37 of 2009) requires all licensed EMS agencies to have a medical director. The statute further provides requirements for physician qualifications and outlines their roles and responsibilities. This development document provides references to Section 8125 of Act 37 (related to EMS agency medical directors), and outlines additional requirements and best practices for a physician serving as critical care transport agency medical director.

PA Title 35, Chapter 81 § 8125: EMS Agency Medical Directors

(a) Qualifications

To qualify and continue to function as an EMS agency medical director, an individual shall:

(1) Be a physician.

(2) Satisfy one of the following:

(i) Have successfully completed an emergency medicine residency program accredited by a residency program accrediting body recognized by the State Board of Medicine or the State Board of Osteopathic Medicine.

(ii) Have successfully completed a residency program in surgery, internal medicine, family medicine, pediatrics or anesthesiology, accredited by a residency program accrediting body recognized by the State Board of Medicine or the State Board of Osteopathic Medicine. The physician shall also have

successfully completed or taught an advanced cardiac life support course acceptable to the department within the preceding two years and have completed, at least once, an advanced trauma life support course acceptable to the department and an advanced pediatric life support course acceptable to the department, or other programs determined by the department to meet or exceed the standards of these programs.

Best Practice Recommendation:
Medical Directors should possess the following additional qualifications:

- ***Be board certified [eligible] in emergency medical services or;***
- ***Be board certified in emergency medicine, internal medicine, anesthesiology, critical care, family practice or trauma surgery.***

(iii) Have served as an advanced life support service medical director under the act of July 3, 1985 (P.L.164, No.45), known as the Emergency Medical Services Act, prior to the effective date of this chapter.

(3) Have a valid Drug Enforcement Agency number.

(4) Have completed the EMS agency medical director's course, an EMS fellowship or other EMS training program that is determined by the department to be equivalent.

This training shall assure that the EMS agency medical director has knowledge of:

(i) The scope of practice of EMS providers.

(ii) The provision of EMS pursuant to department-approved protocols.

(iii) The interface between EMS providers and medical command physicians.

(iv) Quality improvement principles.

(v) Emergency medical dispatch principles and EMS agency communication capabilities.

(vi) EMS system design and operation.

(vii) Federal and State laws and regulations regarding EMS.

(viii) Regional and State mass casualty and disaster plans.

Best Practice Recommendation:

A medical director should have 2 years of experience in air and/or ground EMS and should complete additional Department approved education or be board eligible or certified in EMS. The content of educational program should include:

- ***Altitude physiology/stressors of flight (if involved in rotor or fixed wing operations)***
- ***Appropriate utilization of medical ground and air transport service.***
- ***Human factors – Crew Resource Management***
- ***Hazardous materials recognition and response***
- ***Infection control***
- ***"Just Culture" or equivalent education***
- ***Patient care capabilities and limitations***
- ***Stress recognition and management***
- ***Sleep deprivation, sleep inertia, circadian rhythms and recognizing signs of fatigue***

In addition, the medical director should be current and demonstrate competency or provide documentation of equivalent education experiences as directed by and appropriate to the agency's mission statement [scope of services].

(b) Roles and Responsibilities

An EMS agency medical director is responsible for the following:

(1) Reviewing department-approved EMS protocols that are applicable to the EMS agency and ensuring that its EMS providers and other relevant personnel are familiar with the protocols applicable to them.

Best Practice Recommendation:

Medical Directors who are board certified [eligible] in emergency medical services should be permitted to create agency specific, Department approved, ground critical care transport treatment protocols.

(2) Conducting for and reporting to the EMS agency the following:

(i) An initial assessment of an EMS provider at or above the advanced EMT level to determine whether the EMS provider has demonstrated competency in the knowledge and skills one must have to competently perform the skills within the scope of practice of the EMS provider at that level, and a commitment to adequately perform other functions relevant to the EMS provider providing EMS at that level. This subparagraph does not apply if the EMS provider was working for the EMS agency at the same level prior to the physician becoming the medical director for the EMS agency and the EMS provider was credentialed at that EMS agency within the last year as being able to perform at the EMS provider's certification level.

(ii) At least annually, an assessment of each EMS provider at or above the advanced EMT level as to whether the EMS provider has demonstrated competency in the knowledge and skills an EMS provider must have to competently perform the skills within the scope of practice of the EMS provider at that level, and a commitment to adequately perform other functions relevant to the EMS provider providing EMS at that level.

(3) Participating in and reviewing quality improvement reviews of patient care provided by the EMS agency and participating in the Statewide and regional quality improvement program.

Best Practice Recommendation:

The critical care agency medical director plays an integral role, through direct participation or delegated authority, in the following quality improvement activities:

Prospective Activities

- ***Participates in policy and procedure development and rollout***
- ***Participates in clinical equipment purchase decisions***
- ***Involved in design of orientation and/or mentoring programs***
- ***Develops agency specific, Department approved, protocols (Type I Team)***
- ***Participates in communicable disease prevention program development***
- ***Establishing clinical performance and benchmarking standards***
- ***Participates in policy and procedure compliance monitoring***
- ***Participates in clinical staff hiring***

Concurrent Activities

- ***Performs direct field observation of clinical operations through ride-a-longs or similar programs at least four times per year***
- ***Conducts grand rounds or other continuing education programs for clinical staff at least four times per year***

Retrospective Activities

- ***Leads clinical research studies and pilot programs***
- ***Participates in communicable disease prevention program monitoring***
- ***Conducts protocol compliance audits for:***
    - ***Patient refusal of care and/or transport***
    - ***Appropriate transport resource utilization***
    - ***Release of patient to lower level care***
    - ***Focused patient care topics selected by QI committee***
    - ***Randomly selected cases***
- ***Leads clinical care concern investigations***

(4) *Providing medical guidance and advice to the EMS agency.*

Best Practice Recommendation:

- ***Participates in agency strategic plan development***

(5) *Providing guidance with respect to the ordering, stocking and replacement of drugs, and compliance with laws and regulations impacting upon the EMS agency's acquisition, storage and use of those drugs.*

(6) *Maintaining a liaison with the regional EMS medical director.*

Best Practice Recommendation:

- ***Attend regional and statewide critical care transport committees or task forces and;***
- ***Comply with established committee/task force attendance guidelines or;***
- ***Send physician designee if unable to attend***

(7) *Recommending to the department suspension, revocation or restriction of EMS provider's certifications.*

(8) *Reviewing regional mass casualty and disaster plans.*

(9) *Performing other functions as the department may impose by regulation.*

Best Practice Recommendation:

- ***The medical director, or other physician designee, should maintain open communications with referring and accepting physicians, to ensure the appropriate critical care transport resources have been requested to safeguard the patient and crew during transport.***
- ***To maintain this open communication, the medical director should:***
    - ***Participate in prospective educational activities on available transport resources available within both the agency and EMS system.***
    - ***Be available, or ensure physician coverage, to provide consultation to transport team in situations where patient care requirements are found to exceed team resource or for questions related to agency specific protocols.***
    - ***Investigate concerns expressed by a referring or accepting physician regarding controversial issues and patient management.***

Statewide Critical Care Transport Protocols

In Phase III, the workgroup developed, in consultation with the PEHSC Medical Advisory Committee, statewide critical care protocols that address common patient care situations associated with high acuity transports. These protocols are design to complement the current statewide basic and advanced life support protocols.

Statewide protocols are not intended to replace agency-level critical care protocols are already in use by air ambulances. When practicing on an air ambulance, the critical care paramedic is expected to follow these agency-level protocols if authorized to do so by the critical care agency medical director provided the care to be delivered is within the critical care paramedic scope of practice.

Acknowledgements

This project would not have been possible without the participation and dedication of the following individuals:

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Steve Bixby, EMT-P, Geisinger LifeFlight
Colen Booth, EMT-P, Crozer Health System
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Appendix A: Board for Critical Care Transport Paramedic Certification

BCCTPC
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Mission and Background:
The mission of the BCCTPC® is to improve the critical care transport community. This is accomplished by providing a certification exam that is an objective, fair, and honest validation of critical care paramedic knowledge. By offering the best certification process possible, we remain objective and responsive to the needs of the paramedic community.

The continued updating to our exam shows our commitment to a higher level of education. It is our goal to ensure the examination's content is representative of the industry, and improves critical care transport.

This certification process is focused on the knowledge level of accomplished, experienced paramedics currently associated with a Flight and/or Critical Care Transport Teams. The questions on the exam are based in sound paramedicine. The candidate is expected to maintain a significant knowledge of current ACLS, PALS, NALS, & ITLS/PHTLS standards. This exam is not meant to test entry-level knowledge, but rather to test the experienced paramedic's skills and knowledge of critical care transport. As you prepare for the exam, please consider there are a variety of mission profiles throughout the spectrum of transport medicine. Please remember this exam tests the candidates overall knowledge of the transport environment, not the specifics of one individual program. Your program may not for example complete IABP transports, but there may be questions related to these types of transports on the exam. A full listing of the exam content is available on the BCCTPC website.

The BCCTPC® contracted with Applied Measurement Professionals (AMP), a leader in the industry in test validation and psychometric analysis. The methods used by AMP are consistent with professional and technical guidelines such as those detailed in the Standards for Educational and Psychological testing (1999) by the American Educational Research Association, the American Psychological Association, the National Council on Measurements in Education, which provide the research framework that is used as a basis for validity of certification.

The methodology used met the current professional and government standards to assure the defensibility of the exam, as well as meet or exceed the standards of the National Commission for Certifying Agencies (NCCA) and the National Organization for Competency Assurance (NOCA).

Test Question Categories (# of questions):

FP-C Exam	CCP-C Exam
Trauma Management (9) Aircraft Fundamentals, Safety & Survival (12) Flight Physiology (10) Advanced Airway Management (5) Neurological Emergencies (10) Critical Care Patient (20) Respiratory Patient (10) Toxic Emergencies (6) Obstetrical Emergencies (4) Neonatal (4) Pediatric (10) Burns (5) General Medical Patient (16) Environmental (4)	Trauma Management (12) Transport Fundamentals, Safety & Survival (9) Advanced Airway Management (12) Neurological Emergencies (11) Cardiac Patient (12) Respiratory Patient (12) Toxic Exposures/Environmental (12) Obstetrical Emergencies (9) Neonatal/Pediatric Patient (15) Burns (9) General Medical Patient (12)

FP-C Exam Content Outline:

1. **Trauma Management (9)**
   - A. Perform patient triage
   - B. Differentiate injury patterns associated with specific mechanisms of injury
   - C. Identify patients who meet trauma center criteria
   - D. Perform a comprehensive assessment of the trauma patient
   - E. Initiate the critical interventions for the management of the trauma patient
   - F. Provide care for the patient with life-threatening thoracic injuries (e g, pneumothorax, flail chest, tamponade, myocardial rupture)
   - G. Provide care for the patient with abdominal injuries (e g, diaphragm, liver and spleen)
   - H. Provide care for the patient with orthopedic injuries (e g, pelvic, femur, spinal)
   - I. Administer appropriate pharmacology for trauma management

2. **Aircraft Fundamentals, Safety and Survival (12)**
   - A. Assess the safety of the scene
   - B. Conduct preflight checks to ensure aircraft integrity
   - C. Conduct preflight checks to ensure equipment is present, functional, and stowed
   - D. Observe for hazards during aircraft operation
   - E. Utilize proper safety equipment while in flight
   - F. Maintain a sterile cockpit during critical phases of flight
   - G. Approach and depart the aircraft in a safe manner
   - H. Ensure safety around the aircraft
   - I. Secure the patient for flight
   - J. Participate in crew resource management (CRM)
   - K. Participate in flight mission safety decisions (e g, Go-No Go, abort)
   - L. Respond to in-flight emergencies
     1. fire
     2. emergency egress
     3. emergent landing
     4. adverse weather conditions
   - M. Perform immediate post-accident duties at a crash site
   - N. Build survival shelters
   - O. Initiate emergency survival procedures
   - P. Ensure the safety of all passengers (e g, specialty teams, family, law enforcement, observer)

Q. Estimate weather conditions that are below weather minimums

3. Flight Physiology (10)

A. Identify causes of hypoxia
B. Take corrective measures to prevent altitude related hypoxia
C. Identify signs of barometric trauma
D. Identify stressors related to transport (e g, thermal, humidity, noise, vibration, or fatigue related conditions)
E. Take corrective action for patient stressors related to transport
F. Relate the relevant gas laws to patient condition and treatment
G. Relate the stages of hypoxia to patient condition and treatment
H. Identify immediate causes of altitude related conditions in patients
I. Identify immediate causes of altitude related conditions as they affect the air medical crew
J. Provide appropriate interventions to prevent the adverse effects of altitude changes during patient transport

4. Advanced Airway Management Techniques (5)

A. Identify the indications for basic and advanced airway management
B. Identify the indications and contraindications for specific airway interventions
C. Perform advanced airway management techniques
D. Administer appropriate pharmacology for airway management
E. Implement a failed airway algorithm
F. Identify esophageal intubation
G. React to intubation complications
H. Perform alternative airway management techniques (e g, needle cricothyrotomy, surgical cricothyotomy, Seldinger technique, retrograde intubation, LMA)
I. Monitor airway management and ventilation during transport
J. Use mechanical ventilation

5. Neurological Emergencies (10)

A. Conduct differential diagnosis of coma patients
B. Manage patients with seizures
C. Manage patients with cerebral ischemia
D. Initiate the critical interventions for the management of a patient with a neurologic emergency
E. Provide care for a patient with a specific neurologic emergency
F. Perform a baseline neurologic assessment of a trauma patient
G. Perform an ongoing serial evaluation of a neurologic patient
H. Assess changes in intracranial pressure using patient level of consciousness
I. Perform a focused neurological assessment
J. Assess a patient using the Glasgow coma scale
K. Manage patients with head injuries
L. Manage patients with spinal cord injuries
M. Evaluate muscle strength and motor function
N. Administer appropriate pharmacology for neurological management

6. Critical Cardiac Patient (20)

A. Perform a detailed cardiovascular assessment
B. Identify patients experiencing an acute cardiac event (e g, acute myocardial infarction, heart failure, cardiogenic shock, primary arrhythmias, hemodynamic instability)
C. Use invasive monitoring during transport, as indicated, for the purpose of clinical management
D. Provide treatment for patients with acute cardiac events and hemodynamic abnormalities

E. Control cardiopulmonary support devices to patient condition as part of patient management (e g, ventricular assist devices, transvenous pacer, intra-aortic balloon pump)
F. Assist in the control of cardiopulmonary support devices to patient condition as part of patient management (ventricular assist devices, transvenous pacer, intra-aortic balloon pump)
G. Conduct defibrillation during transport
H. Administer appropriate pharmacology for cardiac management

7. Respiratory Patient (10)
A. Perform a detailed respiratory assessment
B. Identify patients experiencing respiratory compromise (e g, acute respiratory distress syndrome, spontaneous pneumothorax, pneumonia)
C. Monitor patient's respiratory status using laboratory values and diagnostic equipment (e g, pulse oximetry, capnography, blood gas values, chest radiography)
D. Provide treatment for patients with acute respiratory events
E. Administer appropriate pharmacology for respiratory management

8. Toxic Exposures (6)
A. Conduct a physical examination of a toxicological patient
B. Decontaminate toxicological patients when indicated
C. Administer poison antidotes when indicated
D. Provide emergency care for victims of envenomation (e g , snake bite, scorpion sting, spider bite)
E. Administer appropriate pharmacology for toxic exposures
F. Provide treatment for toxicological patients (e g, medication overdose, chemical/biological/radiological exposure)

9. Obstetrical Emergencies (4)
A. Perform an assessment of the obstetrical patient
B. Perform fetal assessment
C. React to special transport considerations of the obstetrical patient
D. Provide treatment for high-risk obstetrical patients
E. Assess uterine contractions
F. Conduct interventions for obstetrical emergencies (e g, pregnancy induced hypertension, hypertonic or titanic contractions, cord prolapse, placental abruption)
G. Assess whether transport can safely be attempted or whether delivery should be accomplished at the referring facility
H. Administer appropriate pharmacology for obstetrical patients
I. Manage emergent delivery

10. Neonates (4)
A. Perform an assessment of the neonatal patient
B. Reevaluate the clinical assessment and management of the neonate when initial emergency measures fail
C. Administer appropriate pharmacology for neonatal patients
D. Implement neonatal resuscitation according to established practice
E. Manage the isolette transport
F. Provide treatment of neonatal emergencies

11. Pediatric (10)
A. Perform an assessment of the pediatric patient
B. Identify the pediatric patient experiencing an acute respiratory event (e g, epiglottitis, bronchiolitis, asthma)
C. Identify the pediatric patient experiencing an acute medical event (e g, menningitis, overdose, seizures)

D. Identify the pediatric patient experiencing an acute cardiovascular event (e g, shock, cardiac anomaly, dysrhythmias)
E. Identify the pediatric patient experiencing an acute traumatic event (e g, auto v. pedestrian, falls, child abuse)
F. Administer appropriate pharmacology for pediatric patients
G. Provide treatment of pediatric emergencies

12. Burn Patients (5)
A. Perform an assessment of the burn patient
B. Calculate the percentage of total body surface area burned
C. Calculate appropriate fluid replacement amounts based on the patient's burn injury and physiologic condition
D. Diagnose inhalation injuries in burn injury patients
E. Administer appropriate pharmacology for burn patients
F. Provide treatment of burn emergencies

13. General Medical Patient (16)
A. Perform a focused medical assessment
B. Identify patients experiencing a medical emergency (e g, AAA, Gl bleed, bowel obstruction, HHNC)
C. Use invasive monitoring during transport, as indicated, for the purpose of clinical management
D. Provide treatment for patients with medical emergencies
E. Manage patient condition utilizing available laboratory values (e g, blood glucose, CBC, H/H)
F. Administer appropriate pharmacology for the medical patient
G. Prevent transmissions of infectious disease
H. Provide appropriate pain management
I. Evaluate and record patient pain levels

14. Environmental (4)
A. Perform an assessment of the patient suffering from an environmental emergency
B. Identify the patient experiencing a cold related emergency (e g, frostbite, hypothermia, cold water submersion)
C. Identify the patient experiencing a heat related emergency (e g, heat stroke, heat exhaustion, heat cramps)
D. Identify the patient experiencing a diving related emergency (e g, decompression sickness, arterial gas
E. emboli, near drowning)
F. Identify the patient experiencing an altitude related emergency (e g, HAPE, cerebral edema)
G. Administer appropriate pharmacology for environmental emergency patients
H. Provide treatment of environmental emergencies

CCP-C Exam Content Outline:

1. Trauma Patient Management (12)
A. Differentiate injury patterns associated with specific mechanisms of injury
B. Rate a trauma victim using the Trauma Score
C. Identify patients who meet trauma center criteria
D. Perform a comprehensive assessment of the trauma patient
E. Initiate the critical interventions for the management of the trauma patient
   1. Manage the patient with life-threatening thoracic injuries (e g pneumothorax, flail chest, tamponade, myocardial rupture)

2. Manage the patient with abdominal injuries (e g diaphragm, liver and spleen)
3. Manage the patient with orthopedic injuries (e g pelvic, femur, spinal)
4. Manage the patient with neurologic injuries (e g subdural, epidural, increased ICP)

F. Manage patient's status using
1. laboratory values (e g, blood gas values, ISTAT)
2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)

G. Administer pharmacologic agents
H. Manage trauma patient complications
I. Administer blood products

2. Transport Fundamentals, Safety and Survival (9)

A. Manage the safety of the work environment
B. Conduct checks to ensure transport vehicle integrity
C. Conduct checks to ensure equipment is present, functional, and stowed
D. Observe for hazards during transport vehicle operation
E. Use safety equipment while in transport
F. Secure the patient for transport
G. Practice crew resource management H. Participate in mission safety decisions I. Evaluate transport mode
H. Perform immediate post-accident duties at a crash site
I. Ensure the safety of all passengers (e g, specialty teams, family, law enforcement, observer)
J. Identify stressors related to transport (e g, thermal, humidity, noise, vibration, or fatigue related conditions)
K. Take corrective action for patient stressors related to transport

3. Advanced Airway Management Techniques (12)

A. Identify the indications for basic and advanced airway management
B. Identify the indications and contraindications for specific airway interventions
C. Perform advanced airway management techniques D. Administer pharmacology for airway management
D. Implement a failed airway algorithm
E. React to intubation complications
F. Perform alternative airway management techniques (e g, needle cricothyrotomy, surgical cricothyotomy, retrograde intubation, LMA)
G. Monitor airway management and ventilation during transport
H. Manage mechanical ventilation

4. Neurologic Patient (11)

A. Perform an assessment of the patient
B. Conduct differential diagnosis of patients with coma
C. Manage patients with seizures
D. Manage patients with cerebral ischemia
E. Initiate the critical interventions for the management of a patient with a neurologic emergency
F. Provide care for a patient with a neurologic emergency
G. Assess a patient using the Glasgow coma scale
H. Manage patients with head injuries
I. Manage patients with spinal cord injuries
J. Manage patient's status using
1. laboratory values (e g, blood gas values, ISTAT)
2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)

K. Administer pharmacologic agents
L. Manage neurologic patient complications

5. **Cardiac Patient (12)**
   A. Manage patients experiencing a cardiac event (e g, acute coronary syndrome, heart failure, cardiogenic shock, primary arrhythmias, hemodynamic instability)
   B. Use invasive hemodynamic monitoring
   C. Assist in the use of cardiopulmonary support devices as part of patient management (e g, ventricular assist devices, transvenous pacer, intra-aortic balloon pump)
   D. Use cardiopulmonary support devices as part of patient management (e g, ventricular assist devices, transvenous pacer, intra-aortic balloon pump)
   E. Manage patient's status using
      1. laboratory values (e g, blood gas values, ISTAT)
      2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
   F. Administer pharmacologic agents
   G. Manage cardiac patients complications

6. **Respiratory Patient (12)**
   A. Perform an assessment of the patient
   B. Identify causes and stages of respiratory failure
   C. Manage patients with respiratory compromise (e g, acute respiratory distress syndrome, spontaneous pneumothorax, pneumonia)
   D. Manage patient's status using
      1. laboratory values (e g, blood gas values, ISTAT)
      2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
   E. Administer pharmacologic agents
   F. Manage respiratory patients complications

7. **Toxic Exposure and Environmental Patient (12)**
   A. Toxic Exposure Patient
      1. Perform an assessment of the patient
      2. Decontaminate toxicological patients (e g, chemical/biological/radiological exposure)
      3. Administer poison antidotes
      4. Provide care for victims of envenomation (e g snake bite, scorpion sting, spider bite)
      5. Manage patient's status using
         a. laboratory values (e g, blood gas values, ISTAT)
         b. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
      6. Administer pharmacologic agents
      7. Manage toxicological patients (e g, medication overdose, chemical/biological/radiological exposure)
      8. Manage toxicological patient complications
   B. Environmental Patient
      1. Per form an assessment of the patient
      2. Manage the patient experiencing a cold-related illness (e g, frostbite, hypothermia, cold water submersion)
      3. Manage the patient experiencing a heat-related illness (e g, heat stroke, heat exhaustion, heat cramps)
      4. Manage the patient experiencing a diving related illness (e g, decompression sickness, arterial gas emboli, near drowning)
      5. Manage the patient experiencing altitude-related illness
      6. Manage patient's status using
         a. laboratory values (e g, blood gas values, ISTAT)
         b. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
      7. Administer pharmacologic agents
      8. Treat patient with environmental complications

8. **Obstetrical Patients** (9)

A. Perform an assessment of the patient
B. Manage fetal distress
C. Manage obstetrical patients
D. Assess uterine contraction pattern
E. Conduct interventions for obstetrical complications (e g, pregnancy induced hypertension, hypertonic or titanic contractions, cord prolapse, placental abruption)
F. Determine if transport can safely be attempted or if delivery should be accomplished at the referring facility
G. Manage patient's status using
    1. laboratory values (e g, blood gas values, ISTAT)
    2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
H. Administer pharmacologic agents
I. Manage emergent delivery and post-partum complications

9. Neonatal and Pediatric Patient (15)

A. Neonatal Patient
    1. Perform an assessment of the patient
    2. Manage the resuscitation of the neonate
    3. Manage patient's status using
        a. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
    4. Administer pharmacologic agents
    5. Manage neonatal patient complications
B. Pediatric Patient
    1. Perform an assessment of the patient
    2. Manage the pediatric patient experiencing a medical event
        • Respiratory • Toxicity
        • Cardiac • Environmental
        • Gl • Endocrine
        • Neuro • Infectious processes
    3. Manage the pediatric patient experiencing a traumatic event
        • Single vs. multiple system
        • Burns
        • Non-accidental trauma
    4. Manage patient's status using
        a. laboratory values (e g, blood gas values, ISTAT)
        b. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
        c. Administer pharmacologic agents
        d. Treat patient with pediatric complications

10. Burn Patients (9)

A. Perform an assessment of the patient
B. Calculate the percentage of total body surface area burned
C. Manage fluid replacement therapy
D. Manage inhalation injuries in burn injury patients
E. Manage patient's status using
    1. laboratory values (e g, blood gas values, ISTAT)
    2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
F. Administer pharmacologic agents
G. Provide treatment of burn complications

11. General MedicalPatient (12)

A. Perform an assessment of the patient

B. Manage patients experiencing a medical condition (e g, AAA, Gl bleed, bowel obstruction, HHNC)
C. Use invasive monitoring for the purpose of clinical management
D. Manage patient's status using
   1. laboratory values (e g, blood gas values, ISTAT)
   2. diagnostic equipment (e g, pulse oximetry, chest radiography, capnography)
E. Administer pharmacologic agents
F. Treat patient with general medical complications

Recertification (Every 4 Years):

General Guidelines

- CE should have a clear and direct application to the practice of critical care medicine.
- A minimum of 100 contact hours must be submitted; 75 of the contact hours must be in the CLINICAL category, 16 CLINICAL hours must be from an approved prep class. 25 CE's may be in the OTHER category to complete the 100 hours. However, it is acceptable to have more than75 of the contact hours in the CLINICAL category.
- For continuing education to be eligible to use for renewal, it must have occurred during the four-year period of certification. For example, if the certification expires March 31, 2006, the four-year period of certification is from April 1, 2003 until March 31, 2006.
- It is recommended that CE logs and supporting documents be sent to the BCCTPC office at least three months and no more than six months prior to certification expiration.
- Renewal requests that are submitted to BCCTPC beyond the certification expiration date will not be accepted.
- Renewal requests are processed according to when they are received by the BCCTPC and the certification expiration date.
- Candidates who successfully meet all program requirements will have their credential renewed for the following four years. Candidates who do not meet the renewal program requirements must register and pass the exam to maintain their credential.
- It is the responsibility of the candidate to identify the number of CLINICAL and OTHER hours of CE activities using the following renewal guidelines. BCCTPC will make the final determination as to category and acceptability of submissions.
- The BCCTPC will perform 100% audit of CE's so each candidate must submit a copy of all CE with the Verification Log.
- All renewal fees are nonrefundable.