



**RECOMMENDATION FOR CONSIDERATION**

Executive Committee Meeting Date: April 17, 2017

Subject: Additional PHRN Education Requirements for Critical Care Transport

VTR#: 0417-01

Committee/Task Force: Statewide Critical Care Task Force

Recommended Goal

Recommended Policy Change

Other:

**Recommendation:**

The Department of Health should adopt the PEHSC recommended educational objectives and equivalencies for PHRNs working on ground critical care transport and/or air ambulances.

**Rationale [Background]:**

Pennsylvania EMS regulations, 28 Pa.C. § 1027.39 (b) and § 1027.40 (b), require at least one of the two ALS-level practitioners providing care to the patient to have “successfully completed a critical care [air ambulance] transport educational program approved by the Department.”

In a previously accepted recommendation by the Department, PEHSC proposed critical care and air ambulance educational objectives for paramedics transitioning to expanded scope of practice, which also satisfies the above referenced regulatory requirement.

During the development process, PEHSC recognized creating CCT educational objectives and equivalencies for PHRNs requires recognition of their basic nursing education as well as nationally recognized certifications a PHRN may hold in critical care transport, emergency, and/or critical care nursing. The recommended educational objectives and equivalencies are a modified version of those previously accepted by the Department for paramedics.

The following matrix outlines the recommended pathways for the PHRN to comply with current EMS regulations:

<b>When PA certified Prehospital Registered Nurse (PHRN) possesses</b>	<b>The PHRN is required to</b>	<b>Notes</b>
No current specialty nursing certification in air or ground critical care transport nursing (CFRN/CTRN); emergency nursing (CEN); or critical care nursing (CCRN)	<ol style="list-style-type: none"> <li>1. Complete a Department approved education course in air medical or ground critical care transport.</li> <li>2. Submit documentation of successful course completion to the agency medical director.</li> </ol>	A list of Department approved courses can be found on the Bureau of EMS website under EMS in PA > EMS Education Information
Current specialty nursing certification as a Certified Flight Registered Nurse (CFRN) or Certified Transport Registered Nurse (CTRN)	Submit documentation of current CFRN or CTRN certification to the agency medical director.	<ol style="list-style-type: none"> <li>1. A PHRN with CTRN certification who intends to practice as a flight nurse is required to complete a Department approved <u>bridge course</u> in topics specific to the air medical transport environment, e.g. aircraft characteristics, flight physiology, etc.</li> <li>2. The <u>bridge</u> can be a stand-alone course or one that is part of the EMS agency’s orientation program for new PHRN’s.</li> </ol>

Current specialty nursing certification as a Certified Emergency Nurse (CEN) or Certified Critical Care Registered Nurse (CCRN)	<ol style="list-style-type: none"> <li>1. Complete a Department approved <u>bridge course</u> in topics related to air or ground critical care transport.</li> <li>2. Submit documentation of successful course completion to the agency medical director.</li> </ol>	<ol style="list-style-type: none"> <li>1. The <u>bridge</u> can be a stand-alone course or one that is part of the EMS agency's orientation program for new PHRN's.</li> <li>2. A list of Department approved courses can be found on the Bureau of EMS website under EMS in PA &gt; EMS Education Information</li> </ol>
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A list of the proposed CCT PHRN educational objectives are attached to this recommendation. Because PHRNs come to critical care/air transport service with varying levels of experience, we recommend the course medical director be given the latitude to determine the depth and breadth of instruction within a given objective based on the target audience.

**Medical Review [Concerns]:**

Physician members for the critical care task force were an integral part of the development process and support proposed educational objectives and equivalencies.

**Fiscal Concerns:**

The fiscal impact of this recommendation on the EMS agency will vary according to the number of employed PHRNs and how many will require additional education versus having an acceptable equivalent national nursing certification.

**Educational Concerns:**

None; this program is an adaptation of the previously accepted CCT education program for the expanded scope paramedic.

**Plan of Implementation:**

A course sponsor will submit to the Department an outline of the proposed PHRN course. The Department, in consultation with PEHSC, will determine if the proposed program meets the established educational objectives. The Department will update the list of approved CCT programs it maintains on its website.

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: \_\_\_\_\_ Date \_\_\_\_\_  
 President

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For PEHSC Use Only – PA Department of Health Response

Accept: \_\_\_\_\_ Table: \_\_\_\_\_ Modify: \_\_\_\_\_ Reject: \_\_\_\_\_

Comments:

Date of Department Response: \_\_\_\_\_

## Pennsylvania Critical Care and Air Transport Educational Program: PHRN Bridge Course

Note: For the purposes of this outline ☆ denotes topics specific to air ambulance transport. A course sponsor checklist has been developed based on these objectives for both the ground CCT and air ambulance transport PHRN bridge course. These checklists were previously submitted to the BEMS for review.

### I. PREPARATORY

#### EMS Systems:

- a. History of critical care transport
- b. Modes of critical care transport
- c. Crew configurations
- d. Prehospital v. Interfacility transports
- e. Ethical considerations

#### Patient Safety:

- a. Provider knowledge/experience
- b. Available resources

#### Medical Director Support:

- a. Declination of transport for safety reasons
- b. Education of facilities and physicians on safe transport practices

#### Flight Operations and Physiology:

- a. Rotary-wing and fixed-wing aircraft ☆
- b. Crash and mishap avoidance ☆
- c. Safety considerations in air-medical operations ☆

#### Atmosphere and Gas Laws:

- a. Temperature ☆
- b. Pressure ☆
- c. Volume ☆
- d. Relative Mass ☆
- e. Boyle's Law ☆
- f. Dalton's Law ☆
- g. Charles' Law ☆
- h. Gay-Lussac's Law ☆
- i. Henry's Law ☆
- j. Graham's Law of Gaseous Diffusion ☆

#### Stresses of Transport:

- a. Hypoxia (review all types) ☆
- b. Barometric Pressure Changes ☆
- c. Thermal Changes ☆
- d. Decreased Humidity ☆
- e. Noise ☆
- f. Vibration ☆
- g. Fatigue ☆
- h. Gravitational Force ☆
- i. Spatial disorientation ☆
- j. Flicker vertigo ☆
- k. Fuel vapors ☆

Pressurized vs. Non-Pressurized Aircraft:

- a. Altitude related disorders ☆
- b. Flight tolerance of the ill and injured ☆

Documentation:

- a. Documenting the critical care assessment
- b. Supplemental documentation for reimbursement and operations

EMS System Communications:

- a. Online Medical Direction
- b. Flight Following ☆
- c. Communicating with ground providers ☆

Medical-Legal Issues and Ethics:

- a. End of life issues during interfacility transport

II. PHARMACOLOGY

Review of medications commonly used encountered during a critical care transport, including, but not limited to; indications, contraindications, dosage and route of administration. Depth and breadth of this review may vary based on the experience level of the PHRNs attending the course.

III. AIRWAY MANAGEMENT, RESPIRATION AND ARTIFICIAL VENTILATION

Review and expand upon the comprehensive knowledge of airway management, respiration and artificial ventilation to include advanced airway management and ventilation modalities that are associated with the critical care patient management.

- a. Drug facilitated airway control (RSI)

Airway Control in Special Patient Populations:

- a. Neonates/infants
- b. Pediatrics
- c. Bariatric patients

Assessment and Management of the Difficult Airway:

- a. Angioedema
- b. Epiglottitis
- c. Trauma related

Mechanical Ventilation:

- a. Principles of ventilation
- b. Patient assessment for mechanical ventilation
- c. Ventilator modes and parameters
- d. Troubleshooting

IV. ASSESSMENT

Expands upon the traditional nursing assessment to include those techniques and parameters associated with a critical care setting, including, an expanded physical assessment, use of diagnostic instruments and interpretation of laboratory values and medical imaging.

Landing Zone Safety Assessment: ☆

- a. Location
- b. Size
- c. Elevated obstructions
- d. Ground-level hazards

History:

- a. Differentiate between essential information in the prehospital and interfacility transport setting

Laboratory Data:

- a. Review of critical laboratory values
- b. Using portable blood analysis devices

Medical Imaging:

- a. Radiographs
- b. CT scans
- c. MRI
- d. Ultrasound

Invasive Pressure Monitoring:

- a. Invasive vs. non-invasive pressure monitoring in prehospital environment
- b. Arterial pressure monitoring
- c. Venous pressure monitoring
  - 1. Triple lumen catheters
  - 2. SCVO2 catheters
  - 3. Pulmonary artery catheters
- d. Invasive monitoring catheter/line management
- e. Calibration and use of pressure transducers
- f. Interpreting pressure measurements

V. MEDICAL

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.

Neurology:

- a. Review of focused assessment and management
- b. Use of NIH stroke assessment tool
- c. Therapeutic hypothermia
- d. Intra-cranial pressure monitoring

Abdominal/GI Disorders:

- a. Review of assessment and management
- b. Altitude considerations ☆

Infectious Diseases:

- a. Review assessment, PPE/universal precautions and management
- b. Review of infection control procedures in the transport environment

Endocrinology:

- a. Review of focused assessment and management
- b. Adrenal insufficiency

Psychiatric:

- a. Ground and air transport safety considerations ☆
- b. Use of physical and/or pharmacological restraint

Cardiology:

- a. Review of focused assessment and management. Reinforce the importance of prehospital STEMI recognition and the use of therapeutic hypothermia in post-resuscitation management.
- b. Electrophysiology devices
  - 1. Pacemakers, including epicardial and transvenous
- c. Cardiac assist devices
  - 1. LVAD and BiVAD
  - 2. Intra-aortic balloon pump (IABP)
  - 3. Extracorporeal membrane oxygenation (ECMO)
- d. Management of mediastinal chest tubes

Toxicology:

- a. Review of focused assessment and management. Reinforce the importance of safety assessment, PPE and decontamination procedures prior to transport
- b. Intentional vs. unintentional poisoning
- c. General management principles
  - 1. Initial management
  - 2. History taking and assessment
  - 3. Symptoms of poisoning or toxic exposure (Toxidromes)
  - 4. Physical exam
  - 5. Laboratory studies
- d. Removal, elimination or disruption of toxins
- e. Supportive and emotional care
- f. Safety issues during transport
- g. Pharmacologic properties of drugs
- h. Toxicity and treatment of poisoning by specific drugs:
  - 1. Acetylsalicylic Acid
  - 2. Acetaminophen
  - 3. Antidepressants, e.g. Tricyclics
  - 4. Benzodiazepines
  - 5. Cardiac drugs, i.e. beta-blockers, calcium channel blockers, digitalis, etc.
  - 6. Cocaine and other illicit drugs
  - 7. Cyanide
  - 8. Hallucinogens
  - 9. Alcohol
- i. Ethylene Glycol
- j. Carbon Monoxide
- k. Snakebite:
  - 1. Recognition of venomous snakes
  - 2. Initial management
  - 3. Advanced treatment during transport, including anti-venom

Respiratory:

- a. Review of focused assessment and management
- b. Management of nitric oxide therapy in pulmonary hypertension
- c. CPAP and BiPAP

Genitourinary/Renal:

- a. Review focused assessment, and management

Gynecology:

- a. Review focused assessment, and management

Non-Traumatic Musculoskeletal Pain:

- a. Review focused assessment, and management

Eyes, Ears, Nose and Throat:

- a. Review focused assessment, and management
- b. Epistaxis management

Shock and Resuscitation:

- a. Review types of shock, assessment parameters and management principles

## VI. TRAUMA

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

Bleeding:

- a. Review management of bleeding, including hemostatic agents and commercial tourniquets

Chest Trauma:

- a. Review focused assessment and management
- b. Needle Thorocostomy

Abdominal and Genitourinary Trauma:

- a. Review focused assessment and management
- b. Understanding ultrasound images as part of the F.A.S.T exam

Orthopedic Trauma:

- a. Review focused assessment and management Use of commercial pelvic stabilization devices
- b. Manual reduction of extremity fracture or dislocation with vascular compromise
- c. Administration of antimicrobials in open fractures

Soft Tissue Trauma:

- a. Review focused assessment and management
- b. Recognition and management of crush syndrome
- c. Recognition and management of compartment syndrome
- d. Burn management review
  - 1. Thermal
  - 2. Chemical
  - 3. Electrical

Head, Facial, Neck and Spine Trauma:

- a. Review focused assessment and management
- b. Advanced management of spinal cord injuries

Nervous System Trauma:

- a. Review focused assessment and management

Special Considerations in Trauma:

- a. Review focused assessment and management of
  - 1. Pregnant patient
  - 2. Pediatric patient
  - 3. Geriatric patient
  - 4. Cognitively impaired patient

Environmental Emergencies:

- a. Review focused assessment and management
- b. Management of suspension trauma

Multi-System Trauma:

- a. Review focused assessment and management
- b. Management of blast injuries

## VII. SPECIAL PATIENT POPULATIONS

Builds on PHRN assessment findings, pathophysiology, and psychosocial needs in order to effectively manage special patient populations in the prehospital setting.

Note: The depth and breadth of this section may be modified by the course sponsor as needed based on the level of experience and/or specialty certification held by the PHRN in this area, e.g. RNs with practice experience in OB, neonatal, etc.

Obstetrics:

- a. Fetal assessment
- b. Fetal monitoring data
- c. Ultrasound images related to ectopic pregnancy
- d. Fetal heart rate abnormalities:
  - 1. Variability
  - 2. Periodic Changes
  - 3. Acceleration (Variable, Early, Late, Sinusoidal)
  - 4. Bradycardia/Tachycardia
- e. Contributing factors to fetal distress
  - 1. Pre-eclampsia/eclampsia
  - 2. Administration of tocolytics
  - 3. Transport considerations with respect to patients in active labor (safety and EMTALA)
  - 4. Complications of pregnancy:
  - 5. Amniotic fluid embolism
  - 6. Breech presentation
  - 7. Post-partum hemorrhage
  - 8. Uterine inversion
  - 9. Precipitous delivery

- 10. Retained placenta
- 11. Shoulder dystocia
- 12. Umbilical prolapse
- f. Nuchal cord
- g. Gestational diabetes
- h. Placenta abruption
- i. Placenta previa
- j. Disseminated intravascular coagulation (DIC)
- k. Multiple gestation
- l. HELLP syndrome
- m. Pre-term labor

Neonatal Care:

- a. Respiratory disorders, e.g. surfactant deficiency
- b. Cardiac structural and flow abnormalities
  - 1. Patent ductus arteriosm (PDA)
  - 2. Patent foramen ovale (PFO)
  - 3. Ventricular septal defect (VSD)
  - 4. Tetralogy of Fallots
  - 5. Transposition of the great vessels
- c. Sepsis
- d. Thermoregulation using an isolette
- e. Critical neonate laboratory values

Pediatrics:

- a. 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:

- a. 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:

- a. Air medical transport of the bariatric patient ☆
  - 1. Aircraft weight and balance issues ☆
- b. Patients requiring specialty equipment and staffing support during interfacility transport
- c. Pre-transport briefing of non-EMS caregivers

## VIII. PSYCHOMOTOR SKILLS REVIEW

Airway and Breathing:

- a. Drug facilitated airway control, i.e. RSI
- b. Operation of mechanical transport ventilators
- c. Needle thorocostomy

Assessment and Monitoring:

- a. Maintenance and access to invasive pressure monitoring devices and interpretation of monitoring parameter information

- b. Interpretation of medical imaging information
- c. Fetal assessment and interpretation of monitoring data
- d. Operation of portable blood analysis equipment

Medical and Cardiac Care:

- a. IABP monitoring
- b. ECMO monitoring
- c. VAD monitoring
- d. Pacemakers

Trauma Care:

- a. ICP monitoring

Special Patient Populations:

- a. Isolette operations