Critical Care Endorsement
Curriculum Objectives for the Paramedic Critical Care Endorsement

Montana Department of Labor and Industry Board of Medical Examiners

The purpose of the Critical Care Endorsement for Paramedic is to provide the Paramedic with the knowledge and skills to effectively and safely manage critically ill or injured patients during transfer between facilities under the oversight of a physician. The Critical Care endorsement is for those Paramedics who routinely perform inter-facility transports, the endorsement is not intended for every Paramedic. The skills identified in this endorsement and the approved Critical Care protocols are intended for inter-facility transfers, not 911 calls.

Patient care should always be based on patient presentation and the Montana Prehospital Treatment Protocols and or the Montana Inter-Facility Transport Protocols. Specific Board approved protocols exist for the Critical Care endorsed EMT-Paramedic and can be downloaded from the web site (www.emt.mt.gov)
FORWARD

The Montana Board of Medical Examiners (BOME) developed the ECP endorsement process to provide the local EMS medical director the ability to expand the individual ECP scope of practice. The BOME has defined the “maximum allowable” skills for each endorsement and established statewide protocols. The endorsement process consists of education and verification.

The local EMS medical director is responsible for verifying an EMT’s knowledge and skills for a particular endorsement. This can be accomplished via a training program; or the medical director may take into account an ECP’s previous education, skill ability or other personal knowledge to determine whether an ECP meets the endorsement knowledge and skill requirements. The local medical director is responsible for the quality of all endorsement training via direct participation and/or oversight.

The medical director cannot exceed the scope of the endorsement, but may set limits on the ambulance service or the individual ECP.

The endorsement material that follows provides the knowledge and psychomotor objectives at the specific endorsement level. Some endorsements may also include sample lesson plans for use in presenting the material. The endorsements (specifically at the AEMT and Paramedic levels) may be non-specific in certain areas (such as specific medications or routes of administration) as the Board does not intend to “practice medicine”. The medical director “practices medicine” and has the ability to determine the specific’s concerning the endorsement. The Board approved protocols define the extent of the local medical directors flexibility: “...The Board authorizes the service medical director to use the Board approved protocols in their entirety or may determine to limit individual EMT providers function / practice where appropriate and in accordance with provider’s abilities. However, the service medical director may not significantly alter (change the performance expectations of the ECP) or expand approved Board protocols without first seeking Board of Medical Examiners approval.” If the medical director wishes to request the Board to “significantly alter” the protocol there is a process identified in the rules for that to occur.

The endorsement process for the EMR level is slightly different. The local Lead Instructor is allowed to document the successful completion of the educational requirements for the EMR endorsement. The Lead Instructor may not take into consideration previous education or training as the local medical director is allowed when completing the individual’s verification form. The Lead Instructor can only verify the individual’s successful completion of the training/educational requirements. This is only allowed at the EMR endorsement levels of monitoring.
The Lead Instructor must remember the endorsement process is a privilege granted to a Montana licensed ECP. Endorsement education can only be offered to Montana ECP licensees; therefore, the Lead Instructor may not combine initial EMR education. The endorsement education must be done independently of the initial program.

The endorsement process requires that the medical director complete a standardized “verification form” (certificate of completion) documenting that an individual ECP has the knowledge and skills identified at the specific endorsement level. The individual ECP then submits an application to the Board to establish the endorsement on their license. The medical director then has the option of granting permission to the individual ECP to perform the endorsement to the extent defined by the medical director. All forms and endorsement materials can be obtained from the web site; www.emt.mt.gov. Any questions or concerns can be addressed to Ken Threet at (406) 841-2359 or kthreet@mt.gov.

Knowledge and Psychomotor Objectives

CONCEPTS AND COMPONENTS OF CRITICAL CARE TRANSPORT
Describe the history of ambulance transports.
Name three examples of Critical Care Transport Team composition configuration.
Identify and describe the preferred qualifications of a Critical Care Transport Paramedic.
Name six advanced procedures performed by a Critical Care Transport Team.
Differentiate between routine and specialty equipment found on a Critical Care Transport unit.
Discuss the three modes of transport for the critically ill or injured.
Identify indications for critical care transport.
Describe the interfacility transfer process.

MEDICOLEGAL ASPECTS OF CRITICAL CARE TRANSPORT
Apply the essential legal principles necessary to the practice of emergency medicine to the job of the critical care paramedic.
Recognize and discuss the legal risks and liabilities involved in critical care transportation.
Apply basic risk management principles to critical care transport.
Discuss the fundamental elements of litigation, hearings and peer-review proceedings.
Understand EMTALA and the implications for EMS
State the appropriate steps for accepting a patient transfer
State the appropriate steps in assessing and preparing for transfer
State CCEMT-P responsibilities during transfer
State the role of other health care providers who accompany the patient
State the appropriate steps to transfer care to the receiving facility
Appropriately document the transfer
Identify areas of potential liability
State methods to minimize risk
Be familiar with current case law regarding transport

LABORATORY DATA INTERPRETATION
Describe the relationship between laboratory medicine and the diagnosis and treatment of patients.
Describe the common problems associated with specimen collection and ways to avoid these problems.
Identify mean lab values and deviations for the complete blood count, the differential blood count, and platelet values.
Interpret arterial blood gas data.
Interpret chemistry studies.
Interpret urinalysis.
Describe the purpose of culture and sensitivity tests.
Interpret miscellaneous lab studies.

SHOCK
Define shock.
Discuss the major pathophysiologies of shock.
Describe how assessment techniques can help identify shock.
Describe the general management principles for the patient in shock.
Describe pharmacological intervention in different types of shock.

MULTI-SYSTEM ORGAN FAILURE
Define multisystem organ failure.
List the history, signs, and symptoms of the patient with sepsis.
Describe the management of the patient with sepsis.
List the history, signs, and symptoms of the patient with acute respiratory distress syndrome (ARDS).
Describe the management of the patient with ARDS.
List the history, signs, and symptoms of the patient with disseminated intravascular coagulation (DIC).
Describe the management of the patient with the management of the patient with DIC.

**INFECTION CONTROL & COMMUNICABLE DISEASES**
Describe proper infection control procedures that the Critical Care Transport Paramedic should take when treating patients.
Identify the mode of transmission and precautions to follow when treating a patient with the following infectious diseases:

- HIV
- Hepatitis
- Multiple-Antibiotic Resistant Bacteria
- Tuberculosis
- Meningitis

**BREATHING ASSESSMENT AND PULMONARY PHYSIOLOGY**
Assess oxygen saturation using a pulse oximeter.
Identify the categories of information obtained through an ABG analysis.
Describe the technique for drawing an ABG.
Describe important landmarks and anatomical structures of the chest wall and respiratory system.
Describe two factors important in the generation of breath sounds.
Describe how to assess breath sounds for duration, pitch, and intensity.
Identify auscultatory sites for breath sounds assessment.
Define normal and adventitious breath sounds.
Define consolidation.
Perform vocal and tactile fremitus assessments of lung fields.
Define and describe abnormal respiratory patterns.
Define and describe respiration and ventilation abnormalities.
Perform a complete respiratory assessment.

**PLEURAL DECOMPRESSION**
Identify indications for pleural decompression.
Discuss methods for pleural decompression assessment.
Describe the procedure for pleural decompression.
Differentiate between normal and abnormal assessment findings.
Identify transport complications associated with pleural decompression.

**PORTABLE VENTILATORS**
Identify indications and purpose for portable ventilators.
Discuss methods for ventilator assessment.
Differentiate between normal and abnormal assessment findings. Describe the procedure for placing a patient on a portable ventilator. Identify transport complications of portable ventilators.

**ET TUBE AND TRACHEAL SUCTIONING**
Identify indications for ET tube and tracheal suctioning. Describe the procedure for ET tube and tracheal suctioning. Identify complications of ET tube and tracheal suctioning.

**MAINTENANCE OF PARALYSIS AND SEDATION DURING VENTILATOR TRANSPORT**
Provide Overview of RSI Identify pharmacologic agents utilized during ventilator transports. Describe why sedative medications should usually accompany the use of paralytic agents. Identify transport considerations for patients intubated with the RSI technique.

**TRACHEOSTOMIES**
Identify indications and purposes for a tracheostomy. Identify criteria for tracheostomy assessment. Differentiate between normal and abnormal assessment findings. Describe the procedure for tracheostomy placement. Identify transport complications of tracheostomies.

**NEEDLE CRICOTHYROTOMY**
Identify indications and purpose for needle cricothyrotomy. Identify criteria for needle cricothyrotomy assessment. Describe the procedure for needle cricothyrotomy. Differentiate between normal and abnormal assessment findings. Identify transport complications for needle cricothyrotomy.

**SURGICAL CRICOTHYROTOMY**
**RETROGRADE INTUBATION**
Discuss the indications and purpose for retrograde intubation.
Identify criteria for retrograde incubation.
Describe the procedure for retrograde intubation.
Differentiate between normal and abnormal assessment findings.
Identify transport complications for retrograde intubation.

**BLOOD ADMINISTRATION**
Differentiate between antigens, natural antibodies and acquired antibodies
Identify antibodies and antigens associated with specific blood types
Define Rh factor
Identify seven types of blood component therapy
Identify indications for blood administration
Describe the procedure for blood administration
Identify the signs and symptoms of transfusion reactions
Describe the management procedures for transfusion reactions
Describe the indications for administration of whole blood and packed red blood cells
Describe the indications for typing, screening and cross matching blood
Describe the ABO system for matching blood
Describe the characteristics of blood products
Describe the procedure for administration of whole blood or packed red blood cells.

**IMPLANTABLE CARDIOVERTER DEFIBRILLATORS**
Discuss the incidence of sudden cardiac death and the population at risk
Describe how and Implantable Cardioverter Defibrillator (ICD) works, its components and its functions
Identify the potential complications associated with the ICD and location of placement in the chest wall
Describe the procedure for deactivating an ICD with a magnet

**CARDIAC PACEMAKERS**
Understand the basic concepts underlying cardiac pacemaker technology
Understand the current code system used for cardiac pacing
Understand and troubleshoot the potential rhythms that indicate forms of pacemaker malfunctions
SEDATIVES
Identify the indications, mechanism of action, pharmacokinetics, dosing and side effects of haloperidol
Identify the mechanism of action of benzodiazepine drugs
Compare the dosing and side effects of diazepam, lorazepam and midazolam
Identify the indications, mechanism of action, pharmacokinetics, dosing and side effects of flumazenil
Identify the indications, mechanism of action, pharmacokinetics, dosing, side effects, drug interactions and administration considerations of propofol

ANALGESICS
Identify the mechanism of action, pharmacokinetics, and side effects of morphine
Identify the mechanism of action, pharmacokinetics, and side effects of naloxone

PARALYTICS
Identify the mechanism of action, pharmacokinetics, and toxicity of succinylcholine
Identify the indications, mechanism of action, pharmacokinetics, side effects and drug interactions of pancuronium, vecuronium and atracurium
Identify the order of paralysis
Discuss the adverse effects of prolonged paralysis
Identify the role of “train of four” monitoring when using paralytics

ANTIHYPERTENSIVES
Compare the mechanism of action, dosing, pharmacokinetics, and adverse effects of captopril, nifedipine and clonidine
Identify the mechanism of action, pharmacokinetics, dosing, toxicity and administration considerations of nitroprusside
Identify the mechanism of action, pharmacokinetics, dosing and adverse effects of labetalol
Identify the pharmacology, pharmacokinetics, dosing and toxicity of diazoxide

VOLUME EXPANDERS
Compare the advantages and disadvantages of crystalloids and colloids
Compare the use, dose and adverse effects of albumin, plasma protein fraction, Hetastarch and Dextran

VASOPRESSORS
Identify the indications for vasopressors
Compare the effects, dosing and adverse effects of dopamine, epinephrine, norepinephrine (Levophed), phenylephrine and dobutamine
**BRONCHODILATORS**
Identify the pharmacology and effects of beta receptor stimulation for beta agonists
Compare the pharmacokinetics, dosing, delivery, and adverse effects of albuterol, epinephrine and terbutaline
Identify the pharmacology, metabolism, adverse effects, drug interaction and dosing of metaproterenol and theophylline
Identify the pharmacology and dosing of anticholinergics
Compare and contrast anticholinergics and beta agonists
Identify the pharmacology and uses of magnesium

**ANTIARRHYTHMICS**
Identify the mechanism of action, ECG effects, uses, pharmacokinetics, dosing and toxicity of Class IA antiarrhythmic drugs
Identify the mechanism of action, ECG effects, uses, pharmacokinetics, dosing and toxicity of Class IB antiarrhythmic drugs
Identify the mechanism of action, ECG effects, and uses of Class IC antiarrhythmic drugs
Identify the mechanism of action, ECG effects, and uses of Class II antiarrhythmic drugs
Identify the mechanism of action, ECG effects, uses, pharmacokinetics, adverse effects and drug interactions of Class III antiarrhythmic drugs
Identify the mechanism of action, ECG effects, and uses of Class IV antiarrhythmic drugs
Compare the pharmacokinetics, dosing and adverse effects of verapamil and diltiazem
Identify the mechanism of action, ECG effects, uses, pharmacokinetics, administration considerations, drug interactions and toxicity of adenosine

**ANTIANGINALS**
Identify the pharmacology, dosage forms, pharmacokinetics, administration considerations, adverse effects, and tolerance considerations of nitrates
Identify the uses, side effects and patient selection criteria for beta blockers
Identify the uses, contraindications, and side effects of calcium channel blockers

**ANTICOAGULANTS**
Identify the mechanism of action, dosing, and clinical trial findings of aspirin as an anticoagulant
Identify the mechanism of action, dosing, monitoring parameters, adverse effects and clinical trial results of heparin
Identify the pharmacology, indications, monitoring parameters, drug interactions and adverse effects of warfarin
**ANTIBIOTICS**
Identify the pharmacology and uses of antibiotics

**ETOMIDATE**
Identify the indications, mechanism of action, pharmacokinetics, and side effects of etomidate

**GI, GU and RENAL ASSESSMENT**
Identify GI/GU assessment criteria
Differentiate between normal and abnormal assessment findings

**NG and OG FEEDING TUBES**
Identify the indications for a nasogastric and orogastric tube
Discuss methods for nasogastric and orogastric assessment
Differentiate between normal and abnormal assessment findings
Describe procedure for placement of nasogastric and orogastric tubes
Identify transport complications associated with nasogastric and orogastric tubes.

**URINARY CATHETERS**
Identify indications and purpose for Foley catheters
Discuss assessment methods for Foley catheters
Differentiate between normal and abnormal assessment findings
Describe procedure for Foley catheter placement
Identify transport complications for Foley catheters

**OSTOMIES**
Identify indications for an ostomy
Discuss methods for ostomy assessment
Differentiate between normal and abnormal assessment findings
Discuss methods for ostomy placement
Identify transport complications for ostomies

**HEMODIALYSIS and PERITONEAL DIALYSIS**
Identify indications and purpose for dialysis
Differentiate between hemodialysis and peritoneal dialysis
Describe the procedure for accessing arteriovenous shunts
Identify transport complications of dialysis patients

**RECTAL CONSIDERATIONS**
Describe the rectal anatomy and structures
Classify rectal bleeding: red, bright red, melena
Discuss incontinence, diarrhea and constipation management techniques
Demonstrate rectal temperature assessment technique
Describe decubitus ulcers
NEUROLOGICAL ASSESSMENT
Describe the major components of a neurological examination
Describe the differences in the neurological assessment between a brain injured or spinal injured patient
Perform a neurological examination
Describe the findings of a normal and abnormal neurological examination
Describe vital signs changes noted with neurological injuries
Identify transportation considerations for patients with neurological injuries

NEUROLOGICAL ASSESSMENT LAB
Correctly perform a neurological assessment
Document the findings of a neurological examination

INTRACRANIAL PRESSURE
Describe intracranial pressure (ICP)
Describe the pathophysiology of ICP
Define compliance
Explain herniation of the brain
Describe how to calculate cerebral perfusion pressure (CPP)
Identify signs and symptoms of increasing ICP
Identify factors that will increase ICP
Identify consequences of increased ICP on patient outcome
Identify strategies and methods for decreasing ICP during critical care transport

TRANSPORTS: START TO FINISH
Differentiate operational aspects of critical care transport and conventional prehospital care
Identify four major opportunities for positive interaction that exist during a critical care transport
Incorporate prospective medical control into the care of critical patients
Identify critical decision points in a transport event
Develop an event flowsheet
Identify essential patient perceptions of quality service
Understand the role of family members in critical care transport
Recognize situations warranting diversion or interception
Incorporate unique management tactics with moribund patients and families

PEDIATRIC CONSIDERATIONS
Identify various histories and general principles for pediatric assessment
Define the primary cause of cardiac arrest and list several risk factors
Describe principles of general treatment before and during the transport of a pediatric patient

**OBSTETRICAL/GYNECOLOGICAL CONSIDERATIONS**
Identify various histories and general principles for OB/GYN assessment
Define the primary cause of cardiac arrest and list several risk factors
Describe principles of general treatment before and during the transport of an OB/GYN patient

**BURN CONSIDERATIONS**
Identify various histories and general principles for burn assessment
Define the primary cause of cardiac arrest and list several risk factors
Describe principles of general treatment before and during the transport of a burn patient

**X-RAY CONSIDERATIONS**
Understand the basic concepts underlying X-ray interpretation
Describe a systematic “assessment” of an X-ray

**CASE STUDIES**
Integrate topics learned with case scenarios