

McLean County Area EMS System



Critical Care Transport Program

**McLean County Area EMS System
Critical Care Transport Program**

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McLean County Area EMS System Critical Care Transport Program

Purpose:

The McLean County Area EMS System recognizes the need to transport critically ill and injured patients from outlying hospitals to larger tertiary care centers. Some patients will require additional skills and procedures that paramedics do not normally perform for stabilization during or prior to transport. Some patients will require administration or maintenance of medications not normally carried by Advanced Life Support vehicles. This will outline the requirements for initial training, continuing education, approved additional skills, procedures, medications, quality assurance and improvement.

McLean County Area EMS System Critical Care Transport Program

Definition

As defined by

The University of Maryland at Baltimore and Medicare

Patient transports within the McLean County Area EMS System will be considered “Critical Care Transports” when:

1. The patient requires a Registered Nurse or Respiratory Therapist for their care.
2. The patient’s vital signs or neurological signs are unstable and require monitoring more frequently than every 30 minutes.
3. The patient requires continuous cardiac monitoring or continuous monitoring of the oxygen saturation.
4. The patient has an endotracheal tube, esophageal obturator airway, Combi-Tube and/or requires mechanical ventilation.
5. The patient has an arterial line or PA catheter.
6. The patient has a chest tube or tracheostomy in place.
7. The patient is receiving IV medications which require the use of a pump to control the rate, including but not limited to the following:
 - a. Cardizem
 - b. Dopamine or Dobutamine
 - c. Regular Insulin IV drip
 - d. Lidocaine
 - e. Procainamide
 - f. TPN
 - g. Tridil
 - h. Heparin
 - i. Isuprel
 - j. Potassium
8. The patient requires the administration of IV sedation or analgesia enroute.
9. The patient has received any thrombolytic therapy within the last 12-24 hours.
10. The patient’s condition deteriorates enroute and requires contact with Medical Control for additional orders.
11. The patient has burns requiring transfer to a burn center.
12. The patient is a high risk OB patient (hypertension, pre-eclampsia, premature labor)
13. The patient has sustained multiple trauma and requires transfer for definitive care.
14. The patient requires administration of a Benzodiazepine reversal agent (Romazicon) enroute.
15. The patient requires the administration of blood or blood products.
16. The patient requires the administration of Compazine enroute.
17. The patient requires any treatment or medication that is not covered in the current System policy or protocol.

McLean County Area EMS System Critical Care Transport Program

Education

Prerequisites:

Paramedics interested in the Critical Care Program must:

1. Have a minimum of **4** years experience as a paramedic on an Advanced Life Support unit
2. Have current certifications in
 - a. CPR
 - b. ACLS
 - c. BTLS or PHTLS
 - d. PALS or PEPP
3. Be a member of, and recommended by an approved Critical Care Transport agency within the McLean County Area EMS System
4. Be approved by the EMS Medical Director

Initial Training:

Initial training will consist of:

1. an 80 hour (minimum) Critical Care Emergency Medical Transport Program as developed by the University of Maryland at Baltimore, or equivalent program
2. orientation to medication pumps
3. additional clinical experience as required by the EMS Medical Director

Continuing Education:

Required continuing education for System Critical Care personnel

1. Maintain relicensing requirements for active paramedics in the McLean County Area EMS System
2. At least 12 hours of ALS continuing education, of the required 48 hours per year, shall have an emphasis in critical care
3. Maintain competency in endotracheal intubation by performing at least, **8** successful intubations per year, in either the field or surgical setting.
4. Additional annual skill competencies as deemed necessary by the EMS Medical Director

Critical Care Transport Program

Outline & Objectives

Course Outline

I. Introduction

Concepts and Components of Critical Care Transport
Aeromedical Considerations
Flight Physiology
Medical Legal Aspects
Infection Control

II. Airway Management

Assessment
Nasal / Oral Airways
Endotracheal intubation
RSI
LMA
Tracheotomies
Cricothyrotomy

III. Breathing Management

Assessment
Oxygen therapy
BVM
Ventilators
End tidal CO₂
Chest tubes
Needle thoracotomy

IV. Circulation Management

Assessment
Shock
12-Lead EKG
Dysrhythmias
IV fluids
IV pumps
Pressure infusers
Hickman lines
Central lines
Swanz Ganz catheters
Blood administration
Arterial line management
Invasive hemodynamic monitoring
Cardiac arrest review
Electrical therapy
Intra-aortic balloon pump
Lab data interpretation

V. Pharmacological Management

Analgesics
Sedatives
Paralytics
Induction agents
Antiarrhythmics
Antihypertensives
Antianginals
Thrombolytics
Vasopressors
Bronchodilators
Pharmacological calculations

VI. G.I. – G. U. Management

Assessment
Naso/orogastric tubes
Foley catheters
Colostomies
Dialysis/AV shunts
GI drains/feeding tubes

VII. Neurologic Management

Assessment
Physical & chemical restraints
Spinal immobilization
Intracranial pressure monitoring

VIII. Complications of Transport & Specialty Patients

Burns
Pediatric Transport Considerations
Emergency Labor and Obstetric considerations
Special Needs Children

Course Learning Objectives

Module A- Introduction

CONCEPTS & 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 CCT Paramedic. Name six advanced procedures performed by a CCT team. Differentiate between routine and specialty equipment found on a CCT unit. Discuss the three modes of transport for the critically ill or injured. Identify indications for critical care transport. Describe the interfacility transfer process.

AEROMEDICAL PHYSIOLOGY

Define Boyle's Law. Name the eight stressors of flight. Name and describe three types of barotraumas. Explain how an unpressurized medical cabin can affect equipment. Explain "time of useful consciousness". List the objective signs and symptoms of hypoxia. List the subjective signs and symptoms of hypoxia. Name six special considerations that should be taken with patients being air transported. Explain how a negative G-force affects the body. Define Dalton's Law. Name three considerations in preventing hearing loss. List four contributing factors to crewmember fatigue.

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 CCT paramedic responsibilities during transfer. State the role of other healthcare 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.

INFECTION CONTROL & COMMUNICABLE DISEASES

Describe proper infection control procedures that the CCT 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.

MODULE B- Airway Management

BREATHING ASSESSMENT AND PULMONARY PHYSIOLOGY

Assess oxygen saturation using a pulse oximeter. Assess carbon dioxide levels using an end tidal CO₂ detector. 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. Describe the procedure for chest tube placement. Identify transport complications for chest tubes.

CHEST TUBE MANAGEMENT

Identify indications and purpose for chest tubes. Discuss methods for chest tube assessment. Differentiate between normal and abnormal assessment findings. Describe the procedure for chest tube placement. Identify transport complications for chest tubes.

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.

RAPID SEQUENCE INDUCTION/INTUBATION

Identify indications and purpose for rapid sequence induction (RSI). Identify pharmacologic agents utilized in RSI. Describe why sedative medications should usually accompany the use of paralytic agents. Outline the technique for RSI. Identify transport considerations for patients intubated with the RSI technique.

MODULE C- Breathing Management

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 for 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

Identify indications and purpose for surgical cricothyrotomy. Identify criteria for surgical cricothyrotomy assessment. Describe the procedure for surgical cricothyrotomy. Differentiate between normal and abnormal assessment findings. Identify transport complications for surgical cricothyrotomy.

RETROGRADE INTUBATION

Discuss the indications and purpose for retrograde intubation. Identify criteria for retrograde intubation. Describe the procedure for retrograde intubation. Differentiate between normal and abnormal assessment findings. Identify transport complications for retrograde intubation.

MODULE D- Circulation Management

INVASIVE LINES

Differentiate between types of invasive lines. Identify indications for invasive lines. Discuss methods for assessing invasive lines. Differentiate between normal and abnormal assessment findings. Identify transport complications of invasive lines.

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 multi-system 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 DIC.

12-LEAD ELECTROCARDIOLOGY

Describe the difference between monitoring and assessing a patient using an ECG machine. Demonstrate proper lead placement for a 12-Lead ECG. Using a simple chart and leads I, II, and III, determine the electrical axis and the presence of fascicular blocks (hemiblocks). Using lead V1 (MCL1), determine bundle branch blocks. Describe the clinical significance of hemiblocks and bundle branch blocks in the cardiac patient. Describe the strategy for identifying V-Tach in wide complex tachycardia. On a 12-Lead or Multi-Lead ECG, identify ST and T-wave changes relative to myocardial ischemia, injury, and infarction. Describe a systematic “assessment” of a 12-Lead ECG. Describe possible complications of various infarct locations.

HEMODYNAMIC MONITORING

Identify hemodynamic monitor controls. Interpret hemodynamic readings. Identify alarm indications. Discuss alarm-troubleshooting procedures. Identify transport complications of hemodynamic monitors. Define: preload, afterload, contractility, systemic vascular resistance, cardiac output, cardiac index. List two purposes for invasive hemodynamic monitoring. Identify the function of each component of a PA catheter including: length markings, balloon inflation port, thermistor port, PA distal port, RA proximal port, auxiliary RA port. List normal hemodynamic pressures and identify normal pressure waveforms for the RA, RV, PA, PCWP, LA, and peripheral arterial sites. Interpret SVO2 monitoring data and discuss appropriate therapeutic modalities to treat abnormal values. Discuss indications of measuring cardiac output and cardiac index. Describe problems commonly encountered in measuring PA pressures and state appropriate interventions. List at least 5 potential complications associated with PA insertion.

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.

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.

MODULE E- PHARMACOLOGICAL MANAGEMENT

IMPLANTABLE CARDIOVERTER DEFIBRILLATORS

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.

INTRA-AORTIC BALLOON PUMPS

Identify indications for IABP. Define the primary physiological effects achieved by the inflation and deflation of the IAB. Describe the set up and operation of an IABP. Discuss the hemodynamic effects of proper balloon inflation and deflation. Identify the factors that affect diastolic augmentation and appropriate troubleshooting considerations. Identify proper timing and appropriate corrective action. Identify transport complications of IABP.

MODULE E – PHARMACOLOGICAL MANAGEMENT

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 metoprolerenol 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, 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.

THROMBOLYTICS

Identify the absolute and relative contraindications to thrombolytic therapy. Compare the pharmacology, pharmacokinetics, dosing and adverse effects of TPA, streptokinase and APSAC. Discuss the benefits of thrombolytic therapy.

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.

MODULE F- G.I. / G.U. MANAGEMENT

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.

Module G- NEUROLOGIC MANAGEMENT

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 of decreasing ICP during critical care transport.

INTRACRANIAL PRESSURE MONITORING

Describe the reasons for ICP monitoring. Differentiate between normal and abnormal findings with ICP monitoring. Describe the advantages, disadvantages, and transport considerations for the following ICP monitoring devices: Intraventricular catheter, Epidural catheter, Subdural/subarachnoid monitoring devices, Fiber optic transducer-tipped probe. Describe ICP waveform. Explain therapies to manage ICP.

Module H- COMPLICATIONS OF TRANSPORT & SPECIALTY PATIENTS

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 care 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.

CASE STUDIES

Integrate topics learned with case scenarios.

BURN MANAGEMENT

Identify and describe burn types, depth and estimate Body Surface Area according to the Rule of Nines, “palm” scale and age appropriate guidelines. Identify principles and methods of burn treatment, analgesia, airway care and patient packaging for transport. Utilize American Burn Association categorizing for minor, moderate, and severe burns. Describe the importance of maintaining fluid volume and body temperature. Describe methods to assure adequate fluid volume, body temperature, describe theory and practice methods of pharmacologic therapy in burns.

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 of 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 a OB/GYN patient.

McLean County Area EMS System Critical Care Transport Program

Right to Deny Transport

A System approved Critical Care Transport Agency has the right to deny transport under the following conditions:

1. If providing the Critical Care transport will impede the ability for the Agency to provide emergency ALS response within their response area due to staffing or equipment.
2. If it is deemed the patient is not stable enough for ground transport after consultation with Medical Control.
3. If the safety of the patient and crew is at significant risk, i.e. weather, road conditions, violent patients.

Rapid Sequence Intubation (RSI)

Only for System approved Critical Care Agencies

Indications:

1. Trauma patients with a Glasgow Coma Scale (GCS) of 9 or less with a gag reflex.
2. Trauma patients with significant facial trauma and poor airway control.
3. Closed head injury or major stroke with unconsciousness.
4. Burn patients with airway involvement and inevitable airway loss.
5. Respiratory exhaustion such as severe asthma, CHF, or COPD with hypoxia.
6. Overdose with altered mental status where loss of airway is inevitable.
7. Patients with an altered level of consciousness and the potential for airway compromise that cannot be controlled by any other means.

Preparation:

1. Assess and treat patient per appropriate protocol.
2. Apply oxygen. Have BVM, Combi-tube, transtracheal jet equipment, and suction ready.
3. If not performed prior, establish IV access, apply cardiac monitor, and pulse oximeter.
4. Prepare and check all ET equipment for endotracheal intubation.
5. Estimate patient's weight, calculate drug doses and draw up into syringes.

Procedure:

1. Preoxygenate with 100% oxygen by non-rebreather mask for 3-5 minutes. If ventilation is required, bag gently with cricoid pressure applied for 3-5 minutes if situation allows.
2. Administer Atropine to patients 8 years old and under.
 - a. Pediatric dose – 0.02 mg/kg, minimum dose 0.1 mg, maximum single dose 1 mg
3. Consider administration of Atropine for adult patients with bradycardia.
 - b. Adult dose – 1 mg
4. Administer Lidocaine 1-1.5 mg/kg IV push two minutes prior to paralysis for patients with head trauma or stroke.

Caution: Do not administer Lidocaine to patients with bradycardia, high degree heart blocks, or ventricular escape rhythms.
5. Administer Amideate (Etomidate) 0.3 mg/kg IV push two minutes prior to paralysis.
6. Administer Succinylcholine 1.5 mg/kg up to 150 mg IV push and wait for paralysis.

Caution: Use extreme caution and/or contact Medical Control for patients with hyperkalemia, (i.e. renal failure), increased intracranial pressure, and eye injury with increased intraocular pressure.

7. Perform endotracheal intubation using Selick's maneuver. Discontinue attempt and ventilate with 100% O₂ if;
 - c. Thirty seconds has elapsed and SaO₂ falls below 91%, or
 - d. Heart rate falls below 60 BPM
8. When successfully intubated, confirm placement by
 - e. Bilateral breath sounds
 - f. Silent epigastrium
 - g. Chest rise and fall
 - h. Esophageal detection device (EDD) or end tidal CO₂ monitoring
9. Secure the ETT using a commercial tube holder
10. Administer Vecuronium (Norcuron) 0.1 mg/kg IV push.
11. If the intubation is unsuccessful, maintain cricoid pressure and provide ventilations by BVM. Consider the use of a Combi-tube or TTJ.
12. If the intubated patient becomes agitated, administer Midazolam(Versed) 1 mg IV push every 1-2 minutes until the patient is calm or a total of 10 mg has been administered. Further medication orders may be given by Medical Control.

McLean County Area EMS System Critical Care Transport Program

Pain Control

Attempts to control the patient's pain will be made whenever possible as long as the patient's condition is stable enough for the pain medication administration and there are no known allergies to the medications.

An assessment will be performed on all patients and treatment started per appropriate System protocol, if appropriate. Pain assessment scales, as shown below, will be used to evaluate the severity of pain. The appropriate pain control medication will be administered either by current System protocol or by Medical Control direction based on the origin of the pain.

Pain Scales

English

Please point to the number that best describes your pain.



No pain

Terrible pain



0
NO
HURT



1
HURTS
LITTLE
BIT



2
HURTS
LITTLE
MORE



3
HURTS
EVEN
MORE



4
HURTS
WHOLE
LOT



5
HURTS
WORST

McLean County Area EMS System Critical Care Transport Program

Pain Control

Isolated traumatic injuries:

1. Treat patient per “Routine Trauma Care- Stable Patient” or “Extremity Trauma” protocol.
2. Consider Toradol (Ketorolac) 30 mg IVP or 60 mg IM for patients less than 65 years of age.
- * Consider Toradol (Ketorolac) 15 mg IVP or 30 mg IM for patients 65 years of age or older.
Caution: Toradol is contraindicated in patients with active peptic ulcer disease and/or recent GI bleeding, advanced renal failure, patients taking ASA or NSAIDS, or any patients at risk for bleeding.

Non-traumatic Pain

1. Treat patient per appropriate System protocol.
2. Patients with ALOC or unstable vital signs should not receive pain medications.
3. * Consider Morphine Sulfate 2-4 mg IVP
 - a. Repeat Morphine Sulfate in 2 mg increments to maximum 10 mg until patient indicates relief or tolerance of pain.
4. * Consider Toradol (Ketorolac) 15-30 mg IVP or 30-60 mg IM
Caution: Toradol is contraindicated in patients with active peptic ulcer disease and/or recent GI bleeding, advanced renal failure, patients taking ASA or NSAIDS, or any patients at risk for bleeding.
5. * Consider Hydromorphone (Dilaudid) 0.5 mg IVP
 - a. Repeat Hydromorphone (Dilaudid) 0.5 mg IVP every 5 minutes to maximum 2 mg until patient indicates relief or tolerance of pain.
 - b. Patients 65 years and older Hydromorphone (Dilaudid) 0.2 mg IVP every 5 minutes to maximum 2 mg until patient indicates relief or tolerance of pain.
6. * Consider Fentanyl 50 mcg IVP over 2 minutes
 - a. Repeat Fentanyl 50 mcg IVP over 2 minutes to maximum 100 mcg

Watch for ALOC and respiratory depression when administering narcotics. If ALOC and respirator depression occurs, administer Naloxone (Narcan) IVP.

McLean County Area EMS System

Critical Care Emergency Medical Transport Program

Approved Medication/Infusion List for Transfers		Required Medications for Critical Care Vehicle	
		Medication	Minimum Quantity
Amiodarone	Magnesium Sulfate		
Ativan	Mannitol	Dilaudid	4 mg
Blood Products	Morphine Sulfate	Etomidate	80 mg
Cardizem	Multivitamin IV	Fentanyl	1 mg
Cinetodine	Natrecor	Norcuron	40 mg
Demerol	Nitroglycerin	Succinylcholine	400 mg
Dilaudid	Norcuron	Toradol	120 mg
Dobutamine	Norepinephrine	Propofol	2 Bottles
Etomidate	PCA Pumps		
Fanotidine	Phenobarbital		
Fentanyl	Primacor		
Heparin	Ranitidine		
Hyperalimentation	Reopro		
Insulin	Rocuronium		
Integrilin	Succinylcholine		
IV antibiotics	Thrombolytics		
IV KCl	Toradol		
Lasix	Valium		
Lidocaine			

Amiodarone
For Critical Care Agency Use Only

Usage:

Class III antiarrhythmic drug. Indicated for treatment and prophylaxis of frequently recurring ventricular fibrillation and hemodynamically unstable ventricular tachycardia. It prolongs the duration of action potential and effective refractory period. Noncompetitive alpha and Beta adrenergic inhibition. It increases PR and QT intervals and decreases sinus rate.

Adverse Reactions:

CV: Hypotension most common, torsades de pointes, sinus arrest, bradycardia, CHF
Pulmonary: Pulmonary toxicity, progressive dyspnea, fatigue, cough, pleuritic pain, fever.

Contraindications:

Known hypersensitivity. cardiogenic shock, marked sinus bradycardia and 2nd or 3rd degree heart block, severe liver disease.

Equipment Use:

Amiodarone must be infused via MIP pump.

Standing Orders:

1. Amiodarone infusion must be initiated at the transferring hospital..
2. Verify concentration and infusion rate prior to leaving transferring hospital.
3. Assess K+, Mg, liver function, if available.
- 4.. Review medication administration record. If taking a beta blocker or calcium channel blocker, notify Medical Control at Resource Hospital. (Amiodarone may be used with caution with these medications.)
5. Assess input and output.
6. Monitor blood pressure, heart rate. Notify Medical Control at Resource Hospital if heart rate less than 60 or B/P less than 90.
7. Rate of infusion should not be changed unless ordered..
8. Amiodarone is incompatible with other drugs. Infuse through a central line if available.

Dosages:

1. Loading dose (to be given at the transferring hospital)
2. After loading dose 360 mg over the next 6 hours, 1 mg per minute.
3. Maintenance infusion: 540 mg over 18 hours (.05 mg/mm..)

EMT-P, who has successfully completed critical care training and critical time, will be monitoring the medication administration.

Ativan (Lorazepam)
For Critical Care Agency Use Only Usage:

Sedative, control of seizures, relief of anxiety

Complications/Adverse Reactions:

Irritation at injection site, hypersensitivity, CNS depression; drowsiness

Equipment:

May be given IV push per protocol.

Standing Orders:

- 1 Routine medical cardiac care
2. Verify orders from transferring hospital
3. Ativan 1-2mg IV push over 2 minutes or as prescribed
- 4 Watch for respiratory depression. If present, notify, Medical Control at Resource Hospital.

EMT-P, who has successfully completed critical care training and critical time, will be monitoring the medication administration.

Blood Administration
For Critical Care Agency Use Only

Usage:

To replace blood loss while maintaining adequate circulating volume and oxygen during transport.

Complications:

Transfusion reactions. Severe reactions are usually manifested during the initial 50cc or less of infusion.

Adverse Reactions:

Too rapid an infusion producing a volume overloaded state.

Incompatible ABO blood administration.

Equipment Use:

Infusion pumps may be helpful but not required unless delivery is through a central venous catheter or pediatrics.

Standing Orders:

- 1 Initial blood administrations will be instituted at the transferring hospital.
2. Verify the physician order for blood product, blood type, rate of infusion and use of microaggregate or leukocyte removal filter.
3. Assess patient for religious or cultural objections to transfusion, history of previous reaction to a blood product and for pre-transfusion symptoms that could be mistaken for a transfusion reaction.
4. Assess baseline TPR and BP prior to starting transfusion and at least every 15 minutes x 2 after the transfusion is initiated; then hourly while blood is infusing and again when transfusion is completed (except albumin and plasma protein fraction). Vital signs must be documented.
5. Assess TPR and BP every 15 minutes x 4 during intravenous gamma globulin administration.
6. Replace blood tubing after every 2 units or after 4 hours of use. Discard tubings immediately following completion of transfusion.

Monitor peripheral site and infusion system at least every hour during blood product administration.

For any suspected reaction:

- Stop transfusion, do not clear tubing
- Recheck labels
- Notify base station physician
- Remove bag and tubings; start isotonic saline
- Monitor and treat symptoms
- Collect a urine specimen for receiving hospital
- Save blood bag - deliver to receiving hospital along with urine specimen for further testing

EMI-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Cardizem (diltiazem)
For Critical Care Agency Use Only

Usage:

Atrial fibrillation with rapid ventricular response, atrial flutter; Paroxysmal Supraventricular Tachycardia (PSVT)

Complications\Adverse Reactions:

CNS dizziness, parasthesias, headache, weakness, visual disturbance.
CV: hypotension, facial flushing, junctional or AV dissociation, chest pain, congestive heart failure, ventricular or atrial arrhythmias, edema
Demertologic: injection site reaction (itching, burning), sweating
GI: constipation, nausea, vomiting, dry mouth

Equipment Maintenance:

All Cardizem drips must be administered via an infusion pump and will be initiated at transferring hospital.

Standing Orders for Administration by Transferring Facility:

Verify concentration, dosage and VS parameters on physician's order sheet from transferring hospital. (Usual dose is 125 mg/ 100 cc NS or D5W or D5 45 NS; this yields 1 mg/min delivered dose)

Monitor vital signs: B/P, heart rate every 15 minutes continuous EKG monitoring.

Notify Medical Control of the vital signs (heart rate < 110 / > 150, or Systolic BP <90) deviate from the predetermined parameters set forth by the transferring hospital.

Notify Medical Control of any AV block.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Demerol
For Critical Care Agency Use

Only Usage:

Analgesia and sedation may be given as a bolus or via PCA pump.

Complications/Adverse Reactions:

Respiratory depression, cardiac arrest, most frequently light headedness, dizziness, sedation, nausea, sweating, tachycardia, hypotension..

Equipment Use:

May be given IV push per protocol

Standing Orders:

1. Verify the dose and route of administration.
2. Demerol PCA must be run through a PCA pump.. Refer to compatibility chart before pushing Demerol through an infusing IV_ If no IV infusing begin D5W or LR KVO..
- 3.. Push IV dose over 1-2 minutes..
- 4.. Monitor VS; if respiratory depression or hypotension occur contact base station physician to administer Narcan
- 5 Monitor pain scale before and after treatment.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration..

Dilaudid (Hydromorphone
hydrochloride) For Critical Care
Agency Use Only

Usage:

Narcotic analgesic. Indicated for the relief of moderate to severe pain.

Adverse Reactions:

More common side effects may include anxiety, constipation, dizziness, drowsiness, fear, impairment of mental and physical performance, inability to urinate, mental clouding, mood changes, nausea, vomiting, restlessness, sedation, troubled and slowed breathing.

Less common side effects may include agitation, blurred vision, chills, cramps, diarrhea, and weakness.

Contraindications:

Known hypersensitivity to drug or narcotic painkillers, pregnant or nursing mothers. Caution should be used in patients who have taken other central nervous depressants, narcotic analgesics, sedative/hypnotics, or tricyclic antidepressants.

Equipment Use:

May be given IV push per protocol.

Standing Orders:

1. Verify drug, dose, and route of administration.
2. Dilaudid PCA must be run through a PCA pump. Refer to compatibility chart before pushing Dilaudid through an infusing IV. If no IV is established, begin NS at TKO rate.
3. Push IV dose over 1-2 minutes.
4. Monitor vital signs; if respiratory depression or hypotension occur, contact Medical Control physician and administer Narcan per protocol.
5. Monitor pain scale before and after treatment.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Dobutamine
For Critical Care Agency Use

Only Usage:

When parenteral therapy is necessary for inotropic support in the short-term treatment of adults with cardiac decompensation due to depressed contractility In patients with atrial fib and rapid ventricular response, a digitalis preparation should be used prior to Dobutamine.

Complications:

Increase HR, BP, may develop rapid ventricular response in atrial fib

Ectopics - may precipitate or exacerbate. Rarely causes VT

Hypersensitivity - rash, fever , eosinophilia, bronchospasm.
Sodium bisulfite may cause allergic reaction, anaphylaxis, asthmatic

Adverse Reactions:

In patients who have shown previous manifestations of hypersensitivity to Dobutamine May be ineffective if received beta blockers; may have increased peripheral vascular resistance

Equipment Use:

IV should be infused via infusion pump.

Standing Orders:

1. IV Dobutamine must be initiated at the transferring hospital..
2. Verify infusion rate, infusion dosage, patients weight prior to transfer
3. Monitor BP and heart rate continuously. If heart rate increases more than 15% of baseline or hypotension occurs, notify base station physician.
- 4 Refer to compatibility chart before infusing any medication through the Dobutamine line No IV push drugs can be given through a Dobutamine infusion.
5. If any redness, swelling, tenderness, warmth appears at IV site, discontinue IV after reestablishing a new IV site.

EMT -P, who have successfully completed critical case training and critical time, will be monitoring the medication administration..

Amidate
(etomidate)
For Critical Care Agency Use Only

Usage:

A hypnotic agent with no analgesic effect used for the induction of general anesthesia. Commonly used in the emergency setting as part of a rapid sequence induction to induce anesthesia.

Adverse Reactions:

Skeletal muscle: Myoclonic skeletal muscle movements, tonic movements.

Respiratory: Apnea of short duration, hyperventilation or hypoventilation, laryngospasm.

CV: Hypertension or hypotension, tachycardia or bradycardia, arrhythmias.

GI: Nausea, vomiting.

Miscellaneous: Eye movements, hiccoughs, snoring.

Contraindications:

Patients with a known hypersensitivity to the drug.

Equipment Use:

Administer via patent intravenous line.

Standing Orders:

1. Use as indicated in the Rapid Sequence Intubation protocol.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Fentanyl
For Critical Care Agency Use Only

Usage:

Acts at specific opioid receptors causing analgesic action of short duration during anesthesia, immediate postoperative periods, and as a general anesthesia agent.

Adverse Reactions:

CNS: Sedation, clamminess, sweating, headache, vertigo, floating feeling, dizziness, lethargy, confusion, dreams, euphoria, seizures.

CV: Palpitations, increased or decreased B/P, cardiac arrest, shock, arrhythmias.

Dermatologic: Rash, hives, flushing, warmth, sensitivity to cold.

GI: Nausea, vomiting.

Respiratory: Slow, shallow respirations, apnea, laryngospasm, bronchospasm, suppression of cough reflex.

Other: Physical tolerance and dependence, psychological dependence.

Contraindications:

Contraindicated with hypersensitivity to opioids, diarrhea caused by poisonings, acute bronchial asthma, upper airway obstruction, pregnancy.

Use cautiously with bradycardia, history of seizures, lactation, renal dysfunction, history of drug addiction.

Equipment Use:

May be administered via infusion pump.

Standing Orders:

1. Verify drug, dose, and route of administration.
2. Fentanyl PCA must be run through a PCA pump. Refer to compatibility chart before pushing Fentanyl through an infusing IV. If no IV is established, begin NS at TKO rate.
3. Push IV dose at rate of 1 minute per cc.
4. Monitor vital signs; if respiratory depression or hypotension occur, contact Medical Control physician and administer Narcan per protocol.
5. Monitor pain scale before and after treatment.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

H2 Blockers
Zantac, (ranitidine), Pepcid, (famotidine), Tagamet (cimetidine)
For Critical Care Agency Use Only

Usage:

Intractable duodenal ulcers, GI bleeding, prevention of ulcers in patients in a high stress state such as a critical illness, gastric ulcers, Zollinger-Ellison..

Complications:

Bradycardia with rapid administration

Adverse Reactions:

Malaise, vertigo, reversible confusion, tachycardia, bradycardia, constipation, nausea, vomiting, rash, muscle cramping.

Equipment Maintenance:

H2 Blockers need to be run through an infusion pump

Standing Orders for Administration by Transferring Facility:

1. Bolus infusions: initial dose must have been administered at transferring hospital
2. Continuous infusions will be started at the transferring hospital.
3. Verify dosage, concentration prior to leaving transferring hospital,
4. Usual dosages:

Zantac bolus: 50 mg to be run over 30 minutes every 6-8 hours.

Zantac Continual Infusion: 150 mg Zantac in 250 cc NS usual rate, 10 cc/hr

Pepcid bolus: 20 mg every 12 bouts

Tagamet: 300 mg bolus every 6 - 8 hours..

EMI-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Heparin Sodium

For Critical Care Agency Use Only

Action:

Inhibit reaction that lead to the clotting of blood and the formation of fibrin clots It acts at multiple sites in the normal coagulation system.

Usage:

Concurrent usage with administration of TPA in the acute MI patient.
Treatment of pulmonary embolism, atrial fibrillation with embolization..
Treatment of peripheral arterial embolism
Treatment of venous thrombi and its extension.

Contraindications:

Severe thrombocytopenia Uncontrolled active bleeding (except when known to be from disseminated intravascular coagulation).

Complications/Adverse Reactions:

Hemorrhage, local site irritation, hypersensitivity, anaphylactic like reaction, adrenal hemorrhage

Equipment:

IV solution must be infused via an infusion pump

Standing Orders:

1. Routine cardiac care
2. Verify initial dose concentration, and infusing rate as well as total time at transferring facility prior to departure.
3. Assess labs prior to transfer if available: H&H, platelets, PTI,.
4. Heparin infusion must be initiated at the transferring hospital.
5. Rates of in fusion should not be changed unless ordered..
6. Usual concentrations of heparin:
25,000 units/500cc yields 50 units/cc
25,000 units/250cc yields 100 units/cc

Note: Any change in rate or dosage of anticoagulant during interfacility transfer can be done only with Medical Control physician orders..

EMI -P, who have successfully completed critical care training and critical time, will be monitoring the medication administration..

Hyperalimentation (TPN, PPN) For Critical Care Agency Use Only

Usage:

Hyperalimentation provides nutrition for patients unable to ingest or tolerate oral or enteral feedings..

Complications:

Infection

Adverse Reactions:

Hyperglycemia, hyperosmolar syndrome, electrolyte disturbance and post infusion syndrome.

Equipment Maintenance and Use:

Hyperalimentation must be administered via an infusion pump.

Standing Orders:

1. Verify solution formula and rate with physician's orders prior to transport,
2. Hyperalimentation is to be considered incompatible with all other medications and IV solutions., Nothing is to be added to the hyperalimentation bag or IV tubing
3. Monitor for signs and symptoms of hyper/hypoglycemia. Obtain blood sugar as needed..
4. **Assess for signs and symptoms of hyper/hypoglycemia.** Contact Medical Control physician if symptoms appear..
5. If a port of a central line is leaking or cracked, clamp off port, start peripheral IV and contact Medical Control for IV fluid orders

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Insulin
For Critical Care Agency Use Only

Usage:

Insulin is a naturally-occurring hormone in the body that causes the uptake of glucose by the cells, decreases blood glucose, and promotes glucose storage. Used in the treatment of Type 1 diabetes, Type 2 diabetes that cannot be controlled by diet or oral agents, and several diabetic ketoacidosis.

Adverse Reactions:

Metabolic: Hypoglycemia.

Contraindications:

Avoid overcompensation of blood glucose level.

Equipment Use:

Insulin must be infused via an infusion pump.

Standing Orders:

1. Insulin infusion must be initiated at the transferring hospital.
2. Verify concentration and infusion rate prior to leaving transferring hospital.
3. Assess level of consciousness, vitals signs, and blood glucose level.
4. If level of consciousness decreases or blood glucose levels drops below 70 mg/dl, contact Medical Control.
5. Rate of infusion should not be changed unless ordered.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Integrilin
For Critical Care Agency Use Only

Usage:

Antiplatelet Agent.. Used with acute coronary syndrome including percutaneous coronary intervention. Prevents fibrinogen., von Willebrand's factor from binding to the glycoprotein Iib/IIIa receptor, fighting platelet aggregation.

Adverse Reactions:

CV stroke, hypotension, systemic bleeding

Equipment Maintenance:

Integrilin must be infused via MTP pump..

Standing Orders for: Administration by Transferring Facility:

- 1.. Integrilin Infusion must be initiated at the transferring hospital.
2. Verify concentration and infusion rate prior to leaving transferring hospital..
3. Assess Hb, HCT, Platelets, PTT, serum creatinine, if available..
4. Monitor for signs and symptoms of bleeding.
5. Rates of infusion should not be changed unless ordered
6. Usual dosages:

Usual Dosage for Serum Creatinine ~2		Renal Impairment Dosage Serum Creatinine 2.- 4	
<i>Patient kg</i>	<i>Infusion ml/hr</i>	<i>Patient kg</i>	<i>Infusion ml/hr</i>
37-41	6	40-55	2
42-46	7	56-68	2.5
47-53	8	59-80	3
54-59	9	81-93	3.5
60-65	10	94-105	4
66-71	11	106-118	4.5
72-78	12	119-131	5
79-84	13	132-143	5.5
85-90	14		
91-96	15		
97-103	16		
104-109	17		
110-115	18		
116-121	19		
> 121	20		

EMI-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

IV Antibiotics
For Critical Care Agency Use Only

Usage:

To treat pre-existing infections or as a prophylactic measure in patients that are at high risk of developing an infection.

Complications:

Allergic reactions: rash, swelling, nausea, vomiting, diarrhea, chills, fever, laryngeal edema, anaphylaxis..
Leukopenia. Ototoxicity, nephrotoxicity (aminoglycosides)..

Adverse Reactions:

Too rapid administration?

Equipment Maintenance:

IV antibiotics should be run through an infusion pump whenever possible. Antibiotics must be infused through a pump if run through a central venous catheter

Standing Orders:

- 1 Initial doses of the IV antibiotics must be administered at the transferring hospital prior to transfer.
2. 2. Known allergies must be assess prior to administering the antibiotics
3. Verify drug, dose, route and time of the administration from the transfer order sheet.
4. Infuse IV antibiotics over 30-60 minutes.. Aminoglyeocides over 60 minutes unless otherwise specified on the physician's order or hospital pharmacy directions.
- 5.. Monitor for signs and symptoms of an allergic response. If any symptoms are noted, stop infusion and contact base station physician..
- 6.. If IV antibiotics have finished infusing enroute, keep line open with NS KVO or LR KVO..
- 7.. Review drug compatibility chart.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

IV KCL

For Critical Care Agency Use Only

Usage:

To replace serum potassium that may be depleted from a disease state or from fluid resuscitation
Maintains neuromuscular excitability of cardiac, smooth and skeletal muscles..

Complications:

Local irritation, burning along the vein of infusion, Nausea, vomiting, abdominal pain. Weakness in legs

In high concentrations: flushing, agitation, hypotension and diaphoresis Peripheral vascular collapse
EKG changes associated with potassium intoxication:

1. Tall tented I waves
2. Depressed S-I segments
3. Prolonged P-R interval, loss of P-wave
4. Heart block, v-fib, cardiac arrest

Adverse Reactions:

Too rapid of IV infusion of an IV solution containing potassium

Equipment Use:

IV solutions should be infused via an MIP infusion pump,.

Standing Orders:

1. IV potassium infusion must be initiated at the transferring hospital and may be run through either central or peripheral line.
2. KCL concentrations may not exceed 44meq KCL in 1 liter of IV solution.. No KCL will be initiated in the field
3. Refer to compatibility chart before administering any IV medications through an IV containing potassium.
4. Monitor for any signs and symptoms of potassium intoxication Stop infusion and notify base station physician of symptoms
5. Monitor urinary output Notify base station physician if urinary output is less than 30cc/hour for 2 consecutive hours
6. Assess IV insertion site for any redness swelling or tenderness,. If above occurs; stop infusion, dc N. Restart infusion after a new IV site has been established,, Notify receiving hospital of the area of the previous IV site. _____-

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Lasix(Furosemide) Infusions
For Critical Care Agency Use Only

Usage:

Congestive heart failure and Acute renal failure that is unresponsive to bolus treatments.

Complications:

Digitalis toxicity, hypokalemia, ventricular ectopy, ototoxicity, electrolyte imbalance, esp potassium and magnesium

Adverse Reactions:

Hypotension, vertigo, tinnitus, hearing loss, rash, weakness, muscle spasm, photosensitivity, ventricular ectopy.

Equipment Maintenance:

Lasix infusions must be run through an infusion pump.

Standing orders:

1. Infusion must be started at the transferring hospital.
2. Verify concentration, infusion rate and VS parameters prior to leaving transferring hospital.
3. Assess serum potassium levels prior to transfer if available
4. Monitor and document VS at least every 15 minutes while in transit.
5. Notify Base Command if B/P drops below 15% of initial baseline.
6. Monitor EKG.. Notify Base Station of any new onset or increase of ventricular ectopy or tachycardia or signs and symptoms of adverse reaction (see above)..
7. Common dosage: 250 mg of Lasix in 250 cc of NS yielding 1 mg/cc, Maintenance dose: 1-.4 mg/kg/hr not to exceed 4 mg/min.
8. Do not give IV bolus medications through the Lasix infusion.

Normal value: Serum K⁺ = 3.5 – 5.0

EMT-P, who have successfully completed critical care training and clinical time, will be monitoring the medication administration.

Levophed
(norepinephrine bitartrate)
For Critical Care Agency Use Only

Usage:

For blood pressure control in acute hypotensive states and as an adjunct in the treatment of cardiac arrest.

Adverse Reactions:

Dizziness, weakness, headache, mood changes, bradycardia, tachycardia, chest pain, shortness of breath, diaphoresis

Contraindications:

Hypotensive states due to hypovolemia.

Equipment Use:

Levophed must be infused via an infusion pump.

Standing Orders:

3. Levophed must be initiated at the transferring hospital.
4. Verify infusion rate, infusion dosage, patients weight prior to transfer
5. Monitor for tachycardia and hypotension.
- 6 Refer to compatibility chart before infusing any medication through the Levophed line. No IV push drugs can be given through a Levophed infusion.
5. If any redness, swelling, tenderness, warmth appears at IV site, discontinue IV after re-establishing a new IV site.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Lidocaine
For Critical Care Agency Use Only

Usage:

Possible MI with ventricular ectopy

Complications/Adverse Reactions:

Confusion or agitation, tinnitus, dizziness, tremors, or seizures

Equipment Use:

W infusion should be infused via an infusion pump .

Standing Orders:

1. Routine cardiac care
2. Suppress ectopy 1) frequent multifocal PVC's, 2) PVC's > 6/minute, 3) PVC's new I-wave.
Lidocaine 1 mg/kg. IV push over 2 minutes., Repeat 0.5 mg/kg dose in 8 minutes (if successful)..
3. If successful with 1 mg/kg bolus, initiate Lidocaine drip at 2 mg/min. If successful with 2 mg/kg bolus, Lidocaine drip at 3 mg/min. If successful with 3 mg/kg bolus, Lidocaine drip at 4 mg/min. Follow all IV bolus medication with 20-30 cc NS flush.
4. If poor response in 2-5 minutes:
 - a.. Lidocaine 0.5 mg/kg until suppressed.
 - b.. Total Lidocaine dose not to exceed 225 mg (3 mg/kg)..

NOTE: Discontinue Lidocaine if,

- 1 Confusion or agitation
- 2.Tinnitus
3. Dizziness
4. Tremors
5. Seizures

5. If unsuccessful with Lidocaine, initiate Procainamide 100 mg IV push over 5 minutes

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Magnesium Sulfate
For Critical Care Agency Use Only

Usage:

Control seizures in toxemia of pregnancy, epilepsy, acute nephritis, hypomagnesemia and hypothyroidism

Acute magnesium deficiency

Cardiac dysrhythmias

Complications/Adverse Reactions:

CNS: Sweating, weak or absent reflexes, drowsiness muscle weakness

CV: Hypotension, flushing, circulatory collapse, heart block, depressed cardiac

function Other:: Respiratory paralysis, hypocalcemia

Equipment:

Magnesium Sulfate must be infused via an infusion pump.

Standing Orders:

1. For monitoring of second and third degree heart block patients receiving MgSO₄ during interfacility transfer. Not to be initiated in the field.

Monitor vital signs every 15 minutes while drug is infusing. Monitor for weakness in extremities (by movement) Watch for signs of respiratory depression and second and third degree heart block Monitor I & O.. Urinary output should be 100ml or more in 4 hour period before each dose given or during W infusion.. This will be measured every 4 hours and documented on flow sheet. Report any changes to base station physician and document. Paramedics will monitor urinary output during interfacility transfer.

3. Early indicators of toxicity include: profound thirst, feeling of warmth, sedation, confusion, muscle weakness..
4. Maximum infusion rate is 150mg/minute. Dose/concentration will be determined by transferring hospital. Recommended 2 grams in 100 cc on MTP pump. The drip will infuse over at least 90 minutes. Rapid drip will induce uncomfortable feeling of heat Constant infusion (MT1~) pump.. Note: Hypomagnesemia is usually accompanied by other electrolyte deficiencies, especially calcium and potassium..
5. IV Bolus cannot be given in field unless direct order given by base station physician in life threatening situation. IV bolus in seizing pregnant patient, 1 -• 2 grams over 2 minutes may be given on direct order from base station physician Action is immediate following injection; duration approximately 30 minutes

Magnesium
Sulfate

EMI-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Mannitol
For Critical Care Agency Use Only

Usage:

Treatment of oligmia, edema, increased intracranial pressure and intraocular pressure.

Complications\Adverse Reactions:

Tachycardia, blurred vision, fluid and electrolyte imbalance hypotension.

Equipment Maintenance:

IV push per protocol, not TV drip.

Standing Orders for Administration by Transferring Facility:

- 1.. Routine medical care.
- 2.. Verify orders for administration of Mannitol. It will be administered on a scheduled dose time as begun at referring hospital..
3. Push 50ml 25% Mannitol slow over 5 minutes..
4. Document vitals every 5 minutes.
5. Flush with sterile water before and after administration.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Morphine Sulfate
For Critical Care Agency Use Only

Usage:

Relief of severe pain..

Complications\Adverse Reactions:

Sedation, somnolence, euphoria, hypotension, bradycardia, respiratory depression

Equipment Maintenance:

May be given IV push per protocol. Morphine Sulfate drips must be administered through an infusion pump. MS PCA through a PCA pump.

Standing Orders:

1. Morphine Sulfate drip will be initiated at transferring hospital.
2. Monitor vital signs every 5 minutes: if respiratory depression, somnolence or hypotension occur; contact base station physician
3. Refer to compatibility chart before infusing any drug through the morphine drip..
4. Consult with base station physician for dose adjustment if morphine drip is not effective in managing pain.
5. Monitor pain scale before and after treatment.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Multi-Vitamin IV Additive (MVI)
For Critical Care Agency Use Only

Usage:

To replace vitamin deficiency in those patients suffering from a chronic disease state. This route is utilized when oral administration is not possible.

Complications:

Allergic Reactions: (thiamine and folic acid) irritation at IV site.

Adverse Reactions: Fainting and dizziness with undiluted drug administration. Hepatotoxicity (Vit A toxicity) Tissue calcification (Vit D toxicity)

Standing Orders:

1. Infusion containing multi-vitamin is to be initiated at the transferring hospital. Rate of infusion will be documented before transfer
2. Refer to compatibility chart before administering any IV medication through the IV infusion containing the multi-vitamin additive
3. The multi-vitamin dose must be diluted in a solution of 500-1000cc of either LR, NS or D5'/2.
4. May be administered in same IV as KCL.
5. Assess IV insertion site for any redness, swelling or tenderness.

If above occurs; STOP infusion and discontinue W. Restart infusion a new IV site has been established. Notify receiving hospital of the area of the previous IV site.

Personnel Administering Drug - EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Natrecor
For Critical Care Agency Use Only

Usage:

Natrecor is indicated for the intravenous treatment of patients with acutely decompensated congestive heart failure who have dyspnea at rest or with minimal activity. Reduces pulmonary capillary wedge pressure and improving dyspnea.

Adverse Reactions:

CV: Hypotension, ventricular tachycardia, bradycardia, angina

GI: Nausea, vomiting

CNS: Insomnia, dizziness, anxiety

Other: Headache, abdominal pain, back pain

Contraindications:

Administration is contraindicated in patients who are hypersensitive to any of the drug components. Should not be used as primary therapy for patients with cardiogenic shock or in patients with a systolic blood pressure less than 90 mmHg. Use should be avoided in patients suspected or having, or known to have, low cardiac filling pressures.

Equipment Use:

Natrecor must be infused via infusion pump.

Standing Orders:

1. Natrecor infusion must be initiated at the transferring hospital.
2. Verify concentration and infusion rate prior to leaving transferring hospital.
3. Monitor vital signs. Notify Medical Control if blood pressure is less than 90 mm/Hg or heart rate is less than 60 beats per minute.
4. Rate of infusion should not be changed unless ordered.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Nitroglycerin Infusion

For Critical Care Agency Use Only

Usage:

1. The principal pharmacological action of nitroglycerin is relaxation of vascular smooth muscle and consequent dilatation of peripheral arteries and veins, (especially the latter). Dilatation of the veins promotes peripheral pooling of blood and increases venous return to the heart, thereby reducing left ventricular end-diastolic pressure and pulmonary capillary wedge pressure (preload). Arteriolar relaxation reduces systemic vascular resistance, systolic arterial pressure, and mean arterial pressure (afterload). Dilatation of the coronary arteries also occurs.
2. Unstable angina, hemodynamically stable
3. Congested heart failure in settings of acute myocardial infarction that are hemodynamically stable
4. Systemic hypertension

Adverse Reactions:

Headaches, dizziness, weakness, nausea, vomiting, hypotension, tachycardia and palpitations.

Equipment Use:

All nitroglycerin infusion must be administered via an MTP infusion pump

Standing Orders:

1. Verify concentration and dosage and VS parameters on physicians order sheet from the transferring hospital
- 2 Nitroglycerin infusions must be in a glass bottle and polyethylene tubing.
- 3 Monitor vital signs: B/P, heart rate at least every 15 minutes when transporting a patient with a nitro drip.
4. Notify Medical Control if the vital signs deviate from the predetermined parameters set forth by transferring MD.
5. Notify Medical Control if chest pain reoccurs while transporting to facility (usually if' systolic <90).
6. Titrate Nitro drip by 10mcg (3cc) if concentration is 50mg/250cc every 3-5 minutes to achieve relief of chest discomfort or until blood pressure systolic > or = 90.
7. Monitor B/P, heart rate pain control 3-5 minutes after an increase in dose.
8. Infusion rates should not be greater than 100mcgs/minute unless ordered by Medical Control.
9. Nitroglycerin infusion must have its separate IV site. No IV push drugs can be administered through this line.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration

Norcuron
(Vecuronium)
For Critical Care Agency Use Only

Usage:

Neuromuscular blocking agent (non-depolarizing) that paralyzes skeletal muscles, including respiratory muscles, used to achieve paralysis to facilitate endotracheal intubations.

Adverse Reactions:

Prolonged paralysis, hypotension, and bradycardia.

Contraindications:

Patients with a known hypersensitivity to the drug.

Equipment Use:

Administered IV push via patent intravenous line.

Standing Orders:

1. Use as indicated in the Rapid Sequence Intubation protocol.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Patient Controlled Analgesia (PCA) Pumps

For Critical Care Agency Use Only

Usage:

Patient Control Analgesia (PCA) has been shown to provide highly effective pain management by allowing patients to titrate analgesia within pre established parameters..

Complications:

Sedation, somnolence, clouded sensorium, euphoria convulsions with large doses, hypotension, bradycardia, respiratory depression, nausea, vomiting, diarrhea, constipation, urinary retention..

Adverse Reactions:

Drugs may interfere with the evaluation of CNS by masking symptoms. May decrease the effects of diuretics in CHF. MS may worsen gallbladder pain. Physical and psychological dependence
Respiratory depression.

Equipment Maintenance and Use:

PCA pumps must be kept plugged in at all times during transport.

Standing Orders:

1. PCA pump will be initiated at transporting hospital..
2. Verify medication and PCA pump settings prior to transporting and initiation should the pump become unplugged.

Medication	Infusion rate (continuous)
Lockout period	Loading dose
- Interval dose	
- Maximum dose	Dose booster
3. There will be no purging of system during interfacility transport..
4. Monitor BP, HR and respiratory rate continuously. Notify Medical Control physician of hypotension, respiratory rate <10 for Narcan order,,
5. Assess total amount of PCA medication administered; doses may be changed (decreased/increased) according to PCA standings order sheet..
6. Discontinue orders for all other narcotics unless approved for use with PCA and documented by transferring institution
7. Lock pump security door with key after cartridge insertion or following changes in pump settings..
8. Close slide clamp on tubing prior to opening door or changing cartridge to prevent accidental bolus

9. Maintain PCA tubing as the primary line, connecting fluid or medication infusion into PCA tubing
10. Validate compatibility of medications additives with PCA narcotic prior to connecting into PCA tubing.
11. Flush the PCA narcotic line with normal saline before and after administration of known incompatible or questionable medications
12. Consult with Medical Control physician for dose adjustment if PCA is not effective in managing pain.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Phenobarbital
For Critical Care Agency Use Only

Usage:

For the treatment of generalized tonic-clonic, cortical focal seizures, and the emergency control of acute seizures (tetanus, eclampsia, epilepticus). Also used as a sedative to relieve anxiety.

Adverse Reactions:

Agitation, confusion, ataxia, vertigo, respiratory depression, bradycardia, hypotension, syncope, nausea, vomiting, and constipation.

Contraindications:

Patients with a known hypersensitivity to barbiturates.

Equipment Use:

Administer slowly via patent IV line.

Standing Orders:

1. Verify orders, dose, and route of administration.
2. For IV administration: do not give more than 60 mg/minute.
3. Monitor for respiratory depression.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Primacor (Milrinone)

For Critical Care Agency Use Only

Usage:

Short- term management of congestive heart failure in patients who have not responded adequately to digitalis, diuretics or vasodilators

Positive inotropic action with vasodilator activity. Reduces afterload and preload by direct relaxant effect on vascular smooth muscle. Produces slight enhancement of AV conduction.

Increases myocardial contractility, improves diastolic function.

Effects are dose-related and plasma drug concentration related.

In presence of depressed myocardial function, produces increase CO, decreased PCWP, and decrease vascular resistance without significant increase in heart rate and myocardial oxygen demand..

Complications\Adverse Reactions:

Headache, tremor, hypokalemia, increased ectopic activity, PVCs, Supraventricular arrhythmias, ventricular tachycardia, ventricular fibrillation.. Hypotension: possible increase in angina symptoms.

Equipment Maintenance:

All Primacor drips must be administered via an infusion pump.

Standing Orders for Administration by Transferring Facility:

Primacor drips will be initiated at the transferring hospital.

Verify concentration, dosage rate and VS parameter on physician's order sheet prior to transfer (usual maintenance dose is .375 to .75 mcg/kg/min).

Monitor vital signs: B/P, heart rate at least every 15 minutes.

Notify Medical Control if the vital signs deviate from the predetermined parameters set forth by the transferring hospital.

Measure PR every 30 minutes. Notify Medical Control if PR begins to shorten..

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Reopro
For Critical Care Agency Use Only

Usage:

Adjunct therapy to PTCA for significantly decrease ischemic complications for patients at high risk for closure of treated coronary vessel; used in conjunction with ASA and heparin. Inhibits platelet aggregation and platelet mediated thrombus by preventing the binding of fibrinogen to the glycoprotein II/III receptor; the final common pathway for platelet aggregation.

Adverse Reactions:

CV: hemorrhagic
stroke Systematic
bleeding

Equipment Use:

Reopro must be infused via MTP pump.

Standing Orders:

1. Reopro infusion must be started at the transferring hospital..
2. Assess H&H, HCB, platelet count, PTT, APTT and ACT if available.
3. Monitor for bleeding.
4. Administer other medications through a separate line.
5. Notify Medical Control if blood pressure is below 90.
6. Dosage should not be changed unless ordered.
7. Monitor B/P, EKG every 15 minutes.

Dosages:

Post PICA: A 12 hour infusion of 10 mcg/min post initial bolus.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration..

Succinylcholine
For Critical Care Agency Use Only

Usage:

For skeletal muscle relaxant, including respiratory muscles, to facilitate rapid sequence intubation.

Adverse Reactions:

Prolonged paralysis, hypotension, and bradycardia.

Contraindications:

Patients with a known hypersensitivity to the drug.

Equipment Use:

Administered via patent intravenous line.

Standing Orders:

1. Use as indicated in the Rapid Sequence Intubation protocol.

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Thrombolytics

For Critical Care Agency Use Only

Type Utilized:

TPA
TNK
Retavase

Usage:

Acute myocardial infarction. To dissolve the clot to reduce infarct size thus reducing myocardial muscle damage.

Complications:

Bleeding. Re-perfusion arrhythmias. Hypotension. Elevated temperature.

Adverse Reactions:

Anaphylactic reaction and hypotension.

Equipment Use:

Thrombolytics must be administered via MTP infusion pump.

Standing Orders:

1. Apply EKG monitor
2. Administer oxygen
 - a. 4L/min by cannula or
 - b. 10-12L/min by mask for marked dyspnea if patient tolerates mask
3. Thrombolytics must be initiated at the transferring hospital. Dosage regimen and times shall be clearly documented on all patients.. (See below)

TPA

4. Protocol for infusion (front loaded dosing/mix TPA according to recommendations (100 mg in 100 cc D5W or NS yields 1 mg/cc).
 - a. **Weight > 65 kg**
 1. Infuse **15 mg** over **1--2 minutes**
 2. Then **50 mg** over **30 minutes**
 3. Then **35 mg** over **60 minutes**
 - b. **Weight < 65 kg**
 1. Infuse **15 mg** over **1-2 minutes**

2. Then **.75mg/kg** over **30** minutes
 3. Then **.50 mg/kg** over **60** minutes
- c. At the end of the infusion, add 20cc saline chaser to the bag to flush tubing of TPA.

TNK

TNK is administered as a single dose at the transferring hospital but its terminal half-life is 41-132 minutes after the initial infusion.

Retavase

Retavase is administered by two intravenous injections 30-minutes apart. Each of the injections should be administered by the transferring hospital. The half life of this medication is 13 - 16 minutes with normal hepatic and renal clearance.

5. Monitor for any signs/symptoms of bleeding internally or externally. Notify Medical Control physician of any signs of bleeding. Note: A nasogastric tube is contraindicated in patients receiving TPA.
6. Monitor VS including B/P, heart rate, respiratory and neuro status, and document every 15 minutes.
7. Treat re-perfusion arrhythmias per protocols and notify Medical Control physician.
8. Notify Medical Control of any reoccurrence of chest pain.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

Toradol
For Critical Care Agency Use Only

Usage:

Indicated in the short-term management of moderately severe acute pain that requires analgesia.

Adverse Reactions:

Headache, drowsiness, dizziness, urticaria, hypertension, dyspnea, hypotension, flushing, nausea, vomiting.

Contraindications:

Patients:

with a known hypersensitivity to the drug
with significant renal impairment or failure
with active peptic ulcer disease, recent GI bleeding, suspected cerebrovascular bleeding, with or any risk for bleeding
with an Aspirin allergy
taking ASA or NSAIDS
in labor or nursing mothers

Equipment Use:

Administered via patent intravenous line or IM.

Standing Orders:

EMT-P, who has successfully completed critical care training and clinical time, will be monitoring the medication administration.

Valium (Diazepam)
For Critical Care Agency Use Only

Usage:

Control of seizures, status epilepticus

Complications/Adverse Reaction:

Drowsiness, confusion, respiratory depression, bradycardia, hypotension, skin irritation

Equipment:

Can be given IV push per protocol.

Note: Refer to compatibility chart before adding Valium to any solution.

Standing Orders:

1. Routine medical/cardiac care.
2. Secure and maintain airway: assist ventilations as necessary.
3. Administer Valium 2 - 4mg IV push if witnessed seizure activity lasting longer than 5 minutes
Notify Medical Control physician of action and for any additional orders.
4. Closely observe for respiratory depression.
5. Monitor vital signs and neuro status continually.

EMT-P, who have successfully completed critical care training and critical time, will be monitoring the medication administration.

McLean County Area EMS System Critical Care Transport Program

Quality Assurance and Improvement

To maintain adequate medical oversight and assure quality patient care, treatment provided by Critical Care personnel will be reviewed by the EMS Medical Director through the McLean County Area EMS System office. Critical Care calls will be reviewed for appropriateness of medical care provided, proper use of medications, and success rates for skills, i.e. ET, IV, etc. The calls will also be reviewed to assure the patients were transported by the most effective method.

Quality review plan

For new agencies, year 1 and 2 – review all calls and provide timely feedback when indicated. The EMS Office will provide the agency with an annual quality report.

For established agencies – review all calls with critical skills performed (i.e. RSI) and random audits as deemed necessary by the EMS Medical Director. Timely feedback will be provided as indicated and the EMS Office will provide the agency with an annual quality report.

RSI QA/QI – All calls in which patients receive rapid sequence induction for endotracheal intubation will be reviewed. The System QA/QI form will be completed by the Critical Care Paramedic after the call which will document an assessment before and after intubation, justification of the procedure, medication doses, and confirmation method of the ET. The form will be signed by the paramedic and the RN or MD receiving the patient and submitted with the run report to the EMS Office for review.

All incident reports will be reviewed by the EMS Office and appropriate actions taken as needed.

**McLean County Area EMS System
Critical Care Agency
Rapid Sequence Intubation**

Date: _____

EMS Run Number: _____

Agency _____

Unit _____

Crew _____

**Indications for RSI
(Before Intubation)**

GCS= _____

Pupil Status: _____

Respiratory Rate: _____

SaO2: _____

Heart Rate: _____

B/P: _____ / _____

Post Intubation

GCS= _____

Pupil Status: _____

Respiratory Rate: _____

SaO2: _____

Heart Rate: _____

B/P: _____ / _____

Number of Attempts: _____

Successful: Yes No

ETT Size: _____

ETT Depth: _____

Confirmation by: _____ Cord visualization
 _____ Silent epigastrum
 _____ EDD
 _____ Capnography

 _____ Chest expansion
 _____ Bilateral Breath Sounds
 _____ End tidal CO2

**To Be Filled Out by Paramedic Performing RSI:
Physical Findings or Justification for Need:**

Estimated Patient Weight _____ kg

Patient Transported to: _____

Receiving RN or MD Signature _____

Paramedic Signature _____

Drugs Used: Dosage and Time		
Drug	Dosage	Time
Atropine		
Lidocaine		
Etomidate		
Succinylcholine		
Vecuronium		
Versed		