Tier II Critical Care ALS Transport

1. **Tier II Critical Care ALS Transport Paramedic will confirm that patient meets criteria for transport according to the MWLCEMS System Critical Care Transport Plan for a Tier II patient and the transfer order is in place. A copy of the patient medical record and transfer forms will be obtained.**
2. Tier II Critical Care ALS Transport paramedic will perform a face to face bedside report and assessment with the transferring nurse. Review patient chart and test results.
3. A Critical Care Transport Report form will be used and include at minimum, but not limited to:
   a. Patient name
   b. Transferring physician and nurse
   c. Receiving facility and physician
   d. Diagnosis
   e. Allergies
   f. Advanced Directives
   g. Respiratory Assessment – including oxygen, oxygen saturation, capnography (when applicable), lung sounds, respiratory effort, any respiratory adjuncts in use and patients response
   h. Cardiac Assessment – including skin parameters, VS, urine output, cardiac rhythm
   i. Neuro assessment
   j. Skin – Documentation of any skin breakdown, assessment of all invasive lines and tubes for skin problems
   k. Labs – any pertinent abnormal labs
   l. Fluids and Medications – All IV sites, fluids and rates, medications and dose infusions
   m. Documentation of any invasive catheters
   n. Pain assessment
   o. Last vital signs
   p. Any other information the provider feels is relevant
   q. Time OLMC contacted with report
4. Transfer procedure will be explained to patient and family
5. Patient will be prepared for transport.
6. Tier II Critical Care ALS Transport paramedic will call report to the Medical Control Physician prior to leaving the transferring unit.
7. MWLCEMS System Standard Operating Procedures/Standing Medical Orders, Tier I and Tier II Critical Care Transport Standard Operating Procedures will be in effect during the transport. Any transfer orders that deviate from the MWLCEMS System Standard Operating Procedures must be discussed with and approved by the Medical Control Physician prior to transfer.
8. Vital signs and mental status will be assess and recorded every 5 minutes during transport.
9. Ongoing reassessment throughout transport
10. Any changes in the patient's condition during transport must be reported to Medical Control. This includes but is not limited to:
    A. Deviation from patients normal vital signs
    B. Signs of respiratory distress
    C. Mental status changes
    D. Cardiac dysrhythmias
11. All care will be documented in the patient care record.
12. Upon arrival at receiving facility; face to face bedside report with the receiving nurse will take place.

If at anytime during transport the patient becomes unstable the Tier II Critical Care ALS Transport paramedic will divert to the closest hospital and OLMC will be notified

Tier II Critical Care ALS Transport
Ventilator

1. **Perform thorough respiratory assessment with transferring nurse to establish baseline including confirmation of tube position and capnography**
2. Confirm ventilator settings as ordered
3. Continue patient's pre-transfer ventilator settings. Utilize respiratory therapist and nurse to adapt to your ventilator if you cannot exactly mimic the settings.
4. Head of the cot elevated 30 – 45 degrees unless contraindicated by the patient's condition.
5. Administer sedation and analgesia as ordered and approved by OLMC.
6. Continuous reassessment of patient, including airway and ventilatory status throughout transport. .

If acute respiratory deterioration occurs and an obvious cause is not immediately determined (i.e. tube disconnect, tube kinked, mucus plug) and corrected, disconnect the patient from the ventilator and initiate manual ventilation with a self-inflating resuscitation bag connected to 100% oxygen. Perform a physical assessment correcting any life threats. Divert to the closest acute care hospital and notify medical control.

High Pressure Alarm:

1. Alerts clinician that the ventilator is using high pressure to deliver the tidal volume
2. Activated when the pressure exceeds 10 to 20 cm/H2O over the patient's peak inspiratory pressure
3. Causes include: coughing, kinking of the tubing, displacement of the airway, bronchospasm, pneumothorax, atelectasis, pneumonia, acute pulmonary edema and ARDS

Low Pressure (Low Exhaled Volume) Alarm:

1. Activated when the tidal volume falls by 50 to 100 ml of the set tidal volume
2. Causes include a disconnect in the ventilator circuit, accidental extubation or a leak in the ET tube or trach cuff.

Apnea Alarm:

1. Activated when the patient has no spontaneous respirations
2. Causes are usually physiological and include decreased mental status, over medication and fatigue.

Low FiO2 Alarm:

1. Triggered when the oxygen source is disconnected or depleted. .

Tier II Critical Care ALS Transport
Arterial Lines

1. **Allows for hemodynamic monitoring**
2. Insertion site assessed with transferring nurse, non-invasive blood pressure taken and compared to the reading from the arterial line.
3. Neurovascular and peripheral vascular assessment of the extremity distal to the catheter is performed and documented.
4. Pressure sleeve is maintained at 300mm HG at all times.
5. The pressure tubing is observed for air bubbles. If present, they are flushed out the stopcock and never into the patient
6. Connections are checked for tightness.
7. Connect transducer to the transport monitor
8. Level and zero the transducer. Transducer should be leveled after patient is moved to your stretcher and with each head of bed position change.
9. The wave form is observed for dampening. If dampening occurs, flush the line, reposition, level and zero the transducer and perform dynamic response test to obtain a proper wave form.
10. A wave form tracing is obtained for the patient care record.

.

Level and Zero Transducer:

1. Level the air/fluid interface (stopcock at the top of the transducer) to the patient's phlebostatic axis
2. Turn the stopcock closest to the transducer off to the patient. Remove the cap, maintaining sterility.
3. Touch the Arterial label on the monitor screen and then touch Zero.
4. When the display reads 0/0, flush the port, recap and turn the stopcock open to the patient and flush the line.

Dynamic Response Test (square wave test)

1. Press the fast flush on the pressure tubing set up and quickly release. The waveform demonstrates a sharp upstroke that terminates in a flat line at the maximal indicator on the monitor and hard copy. This is then followed by an immediate rapid down stroke extending below the baseline with just 1 or 2 oscillations within 0.12 seconds and a quick return to baseline.

Accidental Dislodgement:

1. Apply direct pressure to the site for 5 – 10 minutes to achieve clotting.
2. Once clotting achieved apply a pressure dressing. The dressing should not encircle the extremity in order to prevent ischemia of the extremity.
3. Notify medical control and document in the patient record.
4. Observe site throughout transport for development of hematoma or bleeding. If either seen, apply immediate direct pressure.

Tier II Critical Care ALS Transport
Chest Tubes

A tube inserted into the pleural space/mediastinum or both, to evacuate air, fluid or both, or to help regain negative pressure.

1. Pneumothorax Catheter – Small bore drainage catheter placed in the pleural space to allow expansion of the affected lung and attached to either:
   a. A one-way valve to remove air and possibly very scant drainage
   b. A one-way valve and a drainage system
   c. A drainage system with or without suction to remove air and/or fluid.
2. Chest Tube – Large bore drainage tube placed in the pleural space and attached to a drainage system with or without suction to remove air and/or fluid and allow expansion of the affected lung.

General Care:

1. Clean hands prior to and after care of the chest tube. Appropriate BSI
2. Perform bedside assessment with the transferring nurse to establish patient's baseline, to include:
   a. Assessment of the chest tube insertion site and surrounding area for crepitus, air leaks and position of the tube.
   b. Auscultate breath sounds and observe patient's respiratory status
   c. Ensure chest tube is secured to the patient
   d. Check chest tube connections make sure all connections are taped.
   e. Tubing is free of kinks
   f. Note color, consistency and amount of fluid in the collection chamber.
3. Maintain collection chamber in an upright position
4. Collection chamber should be below level of insertion site at all times.
5. Assess water-seal chamber for bubbling or reduced fluid levels.
6. Note whether the unit is connected to suction. NOTE: When disconnecting suction for any reason, disconnect the suction tubing from the drainage unit connections.
7. Once patient is moved to transport cot. Secure drainage unit to cot.
8. Stabilize additional lengths of tubing by looping it gently and securing it to the cot.
9. Reestablish low continuous suction if ordered once in ambulance.
10. Monitor patient respiratory status and chest tube throughout transport.
11. Notify OLMC immediately for any sudden increase in the amount of drainage.
12. Documentation shall include:
    a. Amount, color and character of the drainage
    b. The amount of the negative pressure
    c. The insertion site and surrounding skin
    d. Respiratory assessment.

Tube Disconnected from Patient

1. Ask patient to maximally exhale or cough
2. Apply occlusive dressing, tape on three sides to create a flutter valve
3. Notify OLMC and divert to the closest hospital immediately
4. Monitor for signs and symptoms of tension pneumothorax; if develops lift side of dressing to allow air to release, recover wound.

Tube Disconnected from Drainage System:

1. Immediately reconnect
2. Assess patient for signs of respiratory distress

3. Notify medical control immediately with assessment and for further orders.

Tier II Critical Care ALS Transport
Central Lines

Perform bedside assessment with transferring nurse to include inspection of the site and patency.
Confirm any infusion fluids and/or medications per IV infusion SOP.

In an emergent situation (i.e. hemodynamic instability, respiratory failure, cardiac arrest) the Tier II Critical Care Transport paramedic may access a preexisting central line

1. Cleanse hands
2. Prepare equipment – IV fluids, tubing, alcohol wipes, sterile gloves, 10ml syringe of sterile normal saline.
3. Dons sterile gloves
4. Cleans connections
5. Attaches 10 ml sterile saline, aspirates to see if there is a return of blood to ensure patency.
6. If no return clamp ort and do not use
7. If return, flush with 10ml saline and connect IV tubing, run at desired rate

Tier II Critical Care ALS Transport
IV Medications and Infusions

1. All fluids and medications will be delivered via an infusion pump during transfer.
2. Bedside assessment with transferring nurse to include
   a. Assessment of IV site
   b. Patency of Line
   c. Confirmation of IV fluid rates
   d. Confirmation of correct medication, dose and infusion rate
3. Ensure all lines and ports are labeled with the names of the infusing fluids or medications
4. Confirms that the medication and dose falls within MWLCEMS System approved medication and dosage list
5. IV site will continue to be inspected during transfer for signs of infiltration
6. If the Tier I Critical Care Transfer Medic is presented with a pump he/she is not familiar with it is his/her responsibility to have the transferring facility in-service them on the pump.

IV medication infusion rates and doses will <u>NOT</u> be changed during transport unless ordered by OLMC.

Approved Tier II Medications
See individual SOPs for Indications, Contraindications, Side Effects, Approved Dosing and Management Guidelines
Abciximab
Amiodarone infusion
Antibiotics (IVPB)
Bumetanide
Calcium
Diltiazem
Dobutamine
Epinephrine infusion
Eptifibatide
Esmolol
Fentanyl infusion
Fospheytoin
Heparin
Hydromorphone
Labetalol
Lidocaine
Magnesium infusion
Mannitol
Metaprolol
Methylprednisolone
Morphine
Nicardipine
Nitorglycerin infusion
Nitroprusside
Norepinephrine
Oxytocin
Potassium infusion
Propofol
Sodium Polystrene Sulfonate
Tirofiban

Tier II Critical Care Transport
Abciximab (Reopro)

1. Class: Platelet aggregation inhibitor
2. Actions: Inhibits platelet aggregation by preventing the binding of fibrinogen, Von Willebreand factor to glycoprotein IIb/IIIa receptor sites of platelets
3. Indications: To prevent acute cardiac ischemia following percutaneous transluminal coronary angioplasty (PTCA) in patients at high risk for reocclusion of affected arteries.
4. Contraindications: Hypersensitivity to abciximab murine proteins; active internal hemorrhage or recent (within 6 weeks) clinically significant GI or GU bleeding; history of CVA within 2 years or with significant neurological deficit; clotting abnormalities or administration of oral anticoagulants within 7 days unless prothrombin time is less than or equal to 1.2 times control PT value; thrombocytopenia; recent (within 6 weeks) major surgery or trauma; intracranial tumor, AV malformation or aneurysm; severe uncontrolled hypertension, history of vasculitis
5. Side effects: Bleeding, including life-threatening hemorrhage; cardiac dysrhythmias, including bradycardia, AV blocks, and atrial fibrillation; also may precipitate hypotension and hematemesis
6. Pharmacokinetics: Bound to platelet receptor sites for up to 10 days; half-life ½ hr
7. Special Considerations:
   a. Monitor for bleeding
   b. Avoid automatic blood pressure cuffs
   c. Limit venipunctures
   d. Use cautiously in patients weighing less than 75kg, older adults, history of GI disease and PCTA lasting greater than 70 minutes
   e. Do not shake the vial
   f. Administered with aspirin and heparin
   g. Dose and infusion changes only with OLMC order

Dosage: Initial IV bolus of 0.25mg/kg administered 10 – 60 minutes prior to the start of the intervention, followed by continuous infusion of 10mg/min for 12 hours. Maximum infusion rate is 10mg/min

Compatibility:

1. Should be administered in a separate line
2. **Y-site administration: Compatible:** Adenosine, argatroban, atropine, bivalirudin, diphenhydramine, fentanyl, metoprolol, midazolam

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Amiodarone

1. Class: Antidysrhythmic Class III
2. Actions: Inhibits adrenergeic stimulation (alpha- and beta-blocking properties, affects sodium, potassium and calcium channels, prolongs the action potential and refractory period in myocardial tissue, decreases AV conduction and sinus node function.
3. Indications: Initial treatment of ventricular dysrhythmias, including ventricular tachycardia and ventricular fibrillation. It can also be used for atrial dysrhythmias such as atrial fibrillation, atrial flutter and PSVT refractory to other antidysrhythmics)..
4. Contraindications: Known hypersensitivity to the drug; certain cardiac dysrhythmias such as sinus bradycardia and second- or third-degree heart blocks. Also avoid used in cardiogenic shock and severe CHF
5. Side effects: Hypotension, bradycardia, AV blocks and ventricular dysrhythmias may occur. Pulmonary toxicity (including ARDS, alveolitis, pneumonitis and interstitial pulmonary fibrosis). Anorexia, nausea, vomiting and constipation have also been associated with the drug. as has photosensitivity to sunlight. Pharmacokinetics: Onset 1 – 30 min; Duration 1 – 3 hrs
6. Special Considerations:
   a. Check potassium and magnesium levels (should attempt to correct low levels if possible before treatment)
   b. Monitor HR, BP, ECG and neurologic status
   c. Monitor for heart failure and respiratory issues
   d. Protect from light unless otherwise directed
   e. Dose and infusion changes only with OLMC order

Dosage:

For perfusing ventricular dysrhythmias:
150mg mixed in 50 ml 0.9NS over 10 minutes, followed by 1mg/min infusion over 6 hours, which is then followed by 0.5mg/min over the next 18 hours. The maintenance infusion can continue for up to 2 – 3 weeks at 0.5mg/min

For non-perfusing v-tach or v-fib:
300mg IV bolus, may be repeated once at 150mg after 5 – 15 min.

Pediatrics:
Perfusing V-tach: 5mg/kg mixed in .9NS over 20 min. V-Fib or V-tach with no pulse 5mg/kg IVP (max single dose of 300mg)

Compatibility:
Compatible: Dobutamine, Lidocaine, Potassium Chloride, Verapamil

Y-Site Compatibility: Atropine, Calcium, Dobutamine, Dopamine, Epinephrine, Eptifibatide, Esmolol, Insulin, Labetalol, Lidocaine, Lorazempam, Methyprednisolone, Metoprolol, Morphine, Nesiritide, Nitroglycerin, Norepinephrine, Potassium Chloride, Tirofiban, Vasopressin.

Incompatible: Heparin, Sodium Bicarbonate, Potassium Phosphates, Sodium Phosphates

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Bumetanide (Bumex)

1. Class: Loop Diuretic
2. Actions: Blocks reabsorption of sodium and water in the renal tubules causing profound dieresis. The drug causes dieresis that is 40 times greater than furosemide, but with a shorter half-life.
3. Indications: Edema that is associated with acute CHF, hepatic or renal diseases; pulmonary edema; ascites; hypertension; anasarca
4. Contraindications: Allergy to bumetanide, anuria, hypotension, dehydration, hepatic coma, and patients with a high BUN. Monitor closely in patients with sulfa allergy.
5. Side effects: Cramping, diarrhea, nausea, vomiting, tinnitus, vertigo, headache, leucopenia, anemia, urticaria, rash, hypokalemia.
6. Pharmacokinetics: IV; Onset 2 – 3 minutes; Peak 15 – 30 minutes; Duration 4 – 6hr
7. Special Considerations:
   a. Monitor VS, cardiac rhythm and urine output closely
   b. Check most recent electrolyte levels prior to transfer.
   c. Dose and infusion changes only with OLMC order

Dosage: 0.5 – 2mg slow IVP over 1 -2 minutes. Repeat at 4 – 5 hour intervals to max allowance of 10mg/day. May be given as a continuous drip at a rate of 0.5 – 2mg/hr.

Compatibility:

Stable in D5W, NS, LR

Y-site administration: Compatible: diltiazem, lorazepam, morphine, propofol,. **Incompatible** nesiritide.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Calcium Chloride/Calcium Gluconate

1. Class: Electrolyte replacement
2. Actions: Cation needed for maintenance of nervous, muscular, skeletal, enzyme reactions, normal cardiac contractility, coagulation of blood; affects secretory activity of endocrine, exocrine glands.
3. Indications: Prevention and treatment of hypocalcemia, hypermagnesemia, hypoparathyroidism, neonatal tetany, cardiac toxicity caused by hyperkalemia, hyperphosphatemia, vit D deficiency.
4. Contraindications: Hypercalcemia, digitalis toxicity, ventricular fibrillation, renal claculi
5. Side effects: Shortened AT, heart block, hypotension, bradycardia, dysrthymias, cardiac arrest; Hypercalcemia (drowsiness, letherargy, muscle weakness, headache, constipation, coma, anorexia, nausea, vomiting, polyuria, thirst.
6. Special Considerations:
   A. Monitor VS, heart rate and rhythm
   B. Monitor ECG for decreased QT and T wave inversion
   C. Observe site for infiltration.

Dosage

In general, IV calcium gluconate is preferred over IV calcium chloride in nonemergency settings due to the potential for extravasation with calcium chloride.

Calcium chloride:

cardiotoxicity in the presence of hyperkalemia, hypocalcemia, or hypermagnesemia: IV: 500-1000 mg over 2-5 minutes; may repeat as necessary

Calcium glucontae:

Hypoglycemia IV: Mild 1000 to 2000mg over 2 hours; Moderate to severe (without seizure or tetany) 4000mg over 4 hours: Severe symptomatic (seizure or tetany) 1000 – 2000 mg over 10 minutes, repeat every 60 minutes until symptoms resolve. May consider continuous infusion of 5 to 20 mg/kg/hour is hypocalcemia is likely to recur due to ongoing losses.

cardiotoxicity in the presence of hyperkalemia, hypocalcemia, or hypermagnesemia: IV: 1500 to 3000 mg over 2 to 5 minutes

Compatibility:

Calcium Chloride:

Stable in D_5LR, $D_5{}^1/_4NS$, $D_5{}^1/_2NS$, D_5NS, D_5W, $D_{10}W$, LR, NS

Y-site administration: Compatible: Amiodarone, dobutamine, epinephrine, esmolol, morphine, nitroprusside,

Calcium gluconate:

Stable in D_5LR, $D_5{}^1/_4NS$, $D_5{}^1/_2NS$, D_5NS, D_5R, D_5W, $D_{10}W$, $D_{20}W$, LR, NS, R, SL; **incompatible** in fat emulsion 10%.

Y-site administration:

Compatible: amiodarone, aztreonam, dobutamine, epinephrine, fentanyl, heparin, labetalol, midazolam, nicardipine, nitroprusside, potassium chloride, propofol,

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Diltiazem (Cardizem)

1. Class: Calcium channel blocker, antihypertensive
2. Actions: Blocks the efflux calcium movement during phase II of the cardiac cycle, prolonging the action potential and refractory period. Depresses automaticity in the SA and AV nodes. Prolongs the conduction time in the AV junction and increases the refractory period at the AV junction. Decreases contractility and peripheral vascular resistance.
3. Indications: Atrial fibrillation/flutter with rapid ventricular response; supraventricular tachycardias refreactory to frontline agents such as adenosine; angina pectoris due to coronary insufficiency, hypertension and vasospasm.
4. Contraindications: Hypotension, bradycardia, second- or third-degree heart blocks without a functioning ventricular pacemaker, sick sinus syndrome, WPW syndrome and known hypersenistivity
5. Side effects: Hypotension, bradycardia, heart blocks, CHF, peripheral edema
6. Pharmacokinetics: IV onset 3 minutes; Duration 1 – 3 hours; continuous infusion after discontinuation 0.5 – 10 hours
7. Special Considerations:
   a. Use cautiously in HF, liver disease, renal disease and in older adults
   b. Monitor closely for hypotension and bradycardia
   c. Do not mix with IV beta blocker administration
   d. This drug is not recommended for administration over 24 hours.
   d. Dose and infusion changes only with OLMC order

Dosage:

0.25 mg/kg IVP over 2 minutes, after 15 minutes if no response may be increased to 0.35mg/kg IVP over 2 minutes. If maintenance infusion is needed 5 – 15 mg/hr for up to 24 hours.

Compatibility:

Stable in $D_5{}^1/_2NS$, D_5W, NS

Compatible: amiodarone, bumetanide, dobutamine, dopamine, epinephrine, esmolol, fentanyl, hydromorphone, labetalol, lidocaine, lorazepam, meperidine, midazolam, morphine, nicardipine, nitroglycerin, nitroprusside, norepinephrine, potassium chloride, potassium phosphates, vasopressin,

Incompatible: Diazepam, heparin, insulin (regular), methylprednisolone sodium succinate, metoprolol, sodium bicarbonate,

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Dobutamine

1. Class: Beta-adrenergic agonist; Catecholamine
2. Actions: Causes increased contractility, increased coronary blood flow and heart rate by acting on Beta 1 receptors in the heart; minor alpha and beta 2 effects
3. Indications: Short-term treatment of cardiac dysfunction secondary to poor cardiac contractility, such as decompensating cardiomyopathy and congestive heart failure
4. Contraindications: Hypertension, tachycardia, acute coronary syndrome with ventricular irritability, idiopathic hypertrophic subaoritc stenosis, known hypersensitivity to sympathomimetic amines.
5. Side effects: Tachycardia, hypertension, cardiac dysrhythmias, angina pain, anxiety, decreased peripheral perfusion, and tissue necrosis if infiltration occurs. The patient may also complain of nausea and vomiting.
6. Pharmacokinetics: IV Onset 1 – 10 minutes; Peak 10 – 20 minutes
7. Special Considerations:
   e. **Do not administer as an IV bolus**
   f. Administer through a central line if possible; if administered peripherally, use a large vein.
   g. Monitor IV patency, will cause tissue necrosis if infiltration occurs.
   h. Monitor VS and cardiac rhythm
   i. Medication is started at lowest dose and titrated to desired effect.
   j. Dose and infusion changes only with OLMC order

Dosage
2 – 20 mcg/kg/min titrated to desired hemodynamic response.

Compatibility:

Stable in D_5LR, $D_5{}^1/_2NS$, D_5NS, D_5W, $D_{10}W$, LR, $^1/_2NS$, NS, mannitol 20%

Per manufacturer, do not give through same IV line as heparin,
Incompatible with heparin and in alkaline solutions (sodium bicarbonate).

Y-site administration: Compatible: amiodarone, anidulafungin, calcium chloride, calcium gluconate, diazepam, Diltiazem, dopamine, dopamine with lidocaine, dopamine with nitroglycerin, dopamine with nitroprusside, epinephrine, eptifibatide, fentanyl, hydromorphone, insulin (regular), labetalol, lidocaine, lidocaine with nitroglycerin, lidocaine with nitroprusside, lorazepam, magnesium sulfate, meperidine, morphine, nicardipine, nitroglycerin, nitroglycerin with nitroprusside, norepinephrine, potassium chloride, propofol, tirofiban, vasopressin, verapamil
.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Epinephrine Infusion

1. Class: Catecholamine; Alpha and Beta Adrenergic agonist,
2. Actions: Marked alpha- and beta-adrenergic stimulation, resulting in cardiac stimulation, Bronchodilation and vascular bed constriction.
3. Indications: Hypotensive shock states not responsive to dopamine.
4. Contraindications: Preexisting hypertension, tachycardia, acute coronary syndrome, ischemic chest pain, narrow-angle glaucoma
5. Side effects: Tachycardia, hypertension, palpitations, cardiac dysrhythmias, tissue necrosis with infiltration and transient elevations in blood glucose levels.
6. Pharmacokinetics: Half-life elimination: IV: <5 minutes
7. Special Considerations:
   a. Monitor BP, HR and cardiac rhythm closely
   b. Monitor infusion site for signs of extravasation.
   c. Protect from light
   d. **Dose and infusion changes only with OLMC order**

Dosage

Begin infusion at 2 – 5 mcg/kg/min, titrate to desired effect. Maximum dose 20mcg/kg/min

- Dopaminergic (renal) dose: 2 – 5 mcg/kg/min
- Beta agonist (cardiac) dose: 5 – 15 mcg/kg/min
- Alpha agonist (vasopressor) dose: 10 – 20 mcg/kg/min

Compatibility:
Stable in dextran 6% in dextrose, dextran 6% in NS, D_5LR, $D_5{}^1/_4NS$, $D_5{}^1/_2NS$, D_5NS, D_5R, $D_{2.5}W$, D_5W, $D_{10}W$, $D_{10}NS$, LR, NS, Ringer's injection; **incompatible** with sodium bicarbonate.

Y-site administration:

Compatible: amiodarone, anidulafungin, calcium chloride, calcium gluconate, diltiazem, dobutamine, dopamine, fentanyl, heparin, hydromorphone, labetalol, lorazepam, midazolam, morphine, nicardipine, nitroglycerin, nitroprusside, norepinephrine, potassium chloride, propofol, tirofiban, vasopressin

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Eptifibatide (Integrilin)

1. Class: Platelet aggregation inhibitor
2. Actions: Reversibly prevents fibrinogen, Von Willebrand's factor from binding to the glycoprotein IIb/IIIa receptor, inhibiting platelet aggregation.
3. Indications: **Acute coronary syndrome:** Treatment of patients with acute coronary syndrome (unstable angina/non-ST-segment elevation myocardial infarction (UA/NSTEMI), including patients who are to be managed medically and those undergoing percutaneous coronary intervention (PCI). **Percutaneous coronary intervention:** Treatment of patients undergoing PCI, including those undergoing intracoronary stenting.
4. Contraindications: Hypersensitivity to eptifibatide or any component of the formulation; active abnormal bleeding within the previous 30 days or a history of bleeding diathesis; history of stroke within 30 days or a history of hemorrhagic stroke; severe hypertension (systolic blood pressure >200 mm Hg or diastolic blood pressure >110 mm Hg) not adequately controlled on antihypertensive therapy; major surgery within the preceding 6 weeks; current or planned administration of another parenteral GP IIb/IIIa inhibitor; dependency on hemodialysis
5. Side effects: Bleeding, including life-threatening hemorrhage, anemia and thrombocytopenia.
6. Pharmacokinetics: Onset of action: Immediate after initial bolus (>80% inhibition of ADP-induced aggregation achieved 5 minutes after bolus dose); maximal effect achieved within 1 hour. Duration: Platelet function restored ~4 to 8 hours following discontinuation
7. Special Considerations:
   a. Administered with aspirin and heparin
   b. Monitor oral secretions, sputum, vomitus, stool and urine for blood,
   c. Limit venipuncture, avoid noncompressable IV sites
   d. Avoid automatic BP cuffs.

Dosage

After initial bolus of 180mcg/kg a maintenance infusion is initiated at 2mcg/kg/min for 72 – 96 hours.

Compatibility:

Stable in NS (infusion may contain up to 60 mEq/L KCl), D_5NS (infusion may contain up to 60 mEq/L KCl).

Y-site administration: Compatible: amiodarone, atropinedobutamine, heparin, lidocaine, meperidine, metoprolol, midazolam, morphine, nitroglycerin, verapamil.

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Esmolol (Brevibloc)

1. Class: Beta-adrenergic blocker
2. Actions: Competitively blocks response to $beta_1$-adrenergic stimulation with little or no effect of $beta_2$-receptors except at high doses,resulting in decreases in chronotropic (heart rate), dromatropic (conduction rate), and inotropic (contractility) effects on myocardium.
3. Indications: Supraventricular tachycardia, noncompensatory tachycardia, hypertensive crisis, coronary artery disease (angina)
4. Contraindications: Hypersensitivity to esmolol or any component of the formulation; severe sinus bradycardia; heart block greater than first degree (except in patients with a functioning artificial ventricular pacemaker); sick sinus syndrome; cardiogenic shock; decompensated heart failure; IV administration of calcium channel blockers (eg, verapamil) in close proximity to esmolol (ie, while effects of other drug are still present); pulmonary hypertension
5. Side effects: Hypotension (usually dose related), bradycardia, development of an AV conduction defect, bronchospasm, headache, dizziness, confusion, and nausea and vomiting.
6. Pharmacokinetics: Onset of action: Beta-blockade: IV: 2-10 minutes (quickest when loading doses are administered); Duration of hemodynamic effects: 10-30 minutes; prolonged following higher cumulative doses, extended duration of use
7. Special Considerations:
   a. Use cautiously with patients with a history of asthma, emphysema, CHF or kidney dysfunction.
   b. Monitor vital signs and cardiac rhythm.
   c. **If heart block, bradycardia or hypotension develops, discontinue infusion immediately and notify OLMC.**
   d. Drug may potentiate the hypoglycemic effects of insulin and prevents sympathetic symptoms of hypoglycemia.
   e. It masks sympathetic clinical indications of shock because the receptors are blocked.

Dosage

Following a loading dose an maintenance infusion of 50mcg/kg/min, which can be increased every 5 – 10 minutes to a max of 300mcg/kg/min. The maintenance dose is usually 25mcg/kg/min infusion.

Compatibility:

Stable in D_5LR, $D_5{}^1/_2NS$, D_5NS, D_5W, D_5R, D_5W with KCl 40 mEq/L, LR, ${}^1/_2NS$, NS

Y-site administration: Compatible: amiodarone, calcium chloride, diltiazem, dopamine, Fentanyl, heparin, insulin (regular), labetalol, magnesium sulfate, midazolam, morphine, nicardipine, nitroglycerin, nitroprusside, norepinephrine, potassium chloride, potassium phosphates, propofol,
.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Fosphenytoin (Cerebryx)

1. Class: Anticonvulsant
2. Actions: After administration, plasma esterases convert fosphenytoin to phosphate, formaldehyde, and phenytoin as the active component; phenytoin works by stabilizing neuronal membranes and decreasing seizure activity by increasing efflux or decreasing influx of sodium ions across cell membranes in the motor cortex during generation of nerve impulses
3. Indications: Treatment of tonic-clonic or complex partial seizure activity, whether new onset or breakthrough in presentation. Also useful for seizure control that occurs during or after neurosurgery.
4. Contraindications: Hypersensitivity to phenytoin, other hydantoins, or any component of the formulation; patients with sinus bradycardia, sinoatrial block, second- and third-degree AV block, or Adams-Stokes syndrome; occurrence of rash during treatment (should not be resumed if rash is exfoliative, purpuric, or bullous); treatment of absence seizures
5. Side effects: Nystagmus,slurred speech, confusion, dizziness, pruritus, paresthesia, headache, somnolence, and ataxia. *Administering too fast can result in severe hypotension, cardiac arrhythmias including bradycardia, heart block, QT interval prolongation, V-tach, V-fib leading to asystole and death.*
6. Pharmacokinetics: Time to peak: Conversion to phenytoin: Following IV administration (maximum rate of administration): 15 minutes;
7. Special Considerations:
   a. Needs to be refrigerated prior to administration
   b. Do not five any faster than 100- - 150mg PE/min.
   c. Monitor BR, HR and rhythm closely.
   d. Monitor IV site closely for infiltration, will cause tissue necrosis
   e. **Dose and infusion changes only with OLMC order**

Dosage

Status epilepticus: IV: Loading dose: 15-20 mg PE/kg administered at 100-150 mg PE/minute
Nonemergent loading and maintenance dosing: IV *Loading dose:* 10-20 mg PE/kg (IV rate: Infuse more slowly [eg, over 30 minutes]; maximum rate: 150 mg PE/minute)

Maintenance dose: 4-6 mg PE/kg/day in divided doses or as continuous infusion

Compatibility:

Stable in D_5LR, $D_5{}^1/_2NS$, D_5W, $D_{10}W$, hetastarch 6% in NS, mannitol 20%, LR, NS.

Y-site administration: Compatible: Lorazepam, phenobarbital. **Incompatible:** Fenoldopam, midazolam.

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Labetalol (Normadyne, Trandate)

1. Class: Antihypertensive
2. Actions: Nonselective beta-blocking agent somewhat similar to Esmolol, it slows sinoatrial (SA) discharge, AV conduction and lessens ventricular inotropy, and also causes alpha blockade effects which result in vasodilation and a diminishment I peripheral resistance.
3. Indications: Hypertensive emergencies, especially in hypertension-induced neurologic emergencies with resultant increased intracranial pressure (intracranial hemorrhage, traumatic brain injury).
4. Contraindications: Hypersensitivity to labetalol or any component of the formulation; severe bradycardia; heart block greater than first degree (except in patients with a functioning artificial pacemaker); cardiogenic shock; bronchial asthma; uncompensated cardiac failure; conditions associated with severe and prolonged hypotension
5. Side effects: Bradycardia, hypotension, and cardiac dysrhythmias are often seen. The patient may also experience bronchospasm. Dizziness, fatigue , nausea, and vomiting are associated with this drug. Fiinally, this drug may precipitate CHF in the susceptible patient.
6. Pharmacokinetics: IV onset 2 – 5 minutes; Peak 5 – 10 min. Duration 2 to 18 hours (dose dependent)
7. Special Considerations:
   a. Monitor BP, HR and heart rhythm closely
   b. Use cautiously in diabetes mellitus, renal disease, hepatic disease, thyroid disease, COPD, bronchospasm
   c. Keep patient supine for 3 hours after IV administration.
   d. **Dose and infusion changes only with OLMC order**

Dosage

Infusion: 2 mg/minute; titrate to response up to 300 mg total cumulative dose (eg, discontinue after 2.5 hours of 2 mg/minute); usual total dose required: 50 to 200 mg;

Compatibility:

Stable in D_5LR, $D_{2.5}{}^1/_2NS$, $D_5{}^1/_4NS$, $D_5{}^1/_3NS$, D_5NS, D_5W, LR, NS, Ringer's; most stable at pH of 2-4. **Incompatible** with sodium bicarbonate 5% and alkaline solutions.

Y-site administration: Compatible: amiodarone, calcium gluconate, diltiazem, dobutamine, dopamine, epinephrine, esmolol, fentanyl, hydromorphone, lidocaine, lorazepam, magnesium sulfate, meperidine, midazolam, morphine, nicardipine, nitroglycerin, nitroprusside, norepinephrine, potassium chloride, potassium phosphates, propofol,

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Lidocaine

1. Class: Antidysrhythmic
2. Actions: Blocks sodium influx during phase 0 of the cardiac cycle, shortens repolarization and action potential duration, stabilizing the cardiac membrane and suppressing ventricular automaticity in ischemic tissue. In addition it is thought to raise the ventricular fibrillation threshold.
3. Indications: Management of acute ventricular dysrhythmias such as ventricular tachycardia, ventricular fibrillation, PVC's, and wide-complex tachycardia of unknown etiology. Also used as an induction agent for blunting intracranial pressure elevations with intubation for the patient with suspected head injury or stroke.
4. Contraindications: Hypersensitivity to lidocaine or any component of the formulation; hypersensitivity to another local anesthetic of the amide type; Adam-Stokes syndrome; Wolff-Parkinson-White syndrome; severe degrees of SA, AV, or intraventricular heart block (except in patients with a functioning artificial pacemaker); premixed injection may contain corn-derived dextrose and its use is contraindicated in patients with allergy to corn or corn-related products
5. Side effects: Anxiety, seizures with higher doses, hypotension, bradycardia, cardiac dysrhythmias, nausea/vomiting, drowsiness and mild paresthesias.
6. Pharmacokinetics: Onset of action: Single bolus dose: 45 to 90 seconds; Duration: 10 to 20 minutes
7. Special Considerations:
   a. Monitor BP HR and cardiac rhythm
   b. Use cautiously in liver disease, HF, respiratory depression and in older adults
   c. Incidence of toxicity is increased if patient has HF or liver disease, has low lean body mass or is elderly or is concurrently taking Tagamet or a beta-blocker

Dosage

Adult:
Ventricular fibrillation or pulseless ventricular tachycardia: If no IV/IO present 2mg/kg ET then 1 mg/kg every 3 – 5 minutes to 6mg/kg ET
Unstable ventricular tachycardia with a pulse: If no IV/IO present 1mg/kg every 3 – 5 min up to 3mg/kg ET
Maintenance Drip: 1 -4 mg/min (therapeutic blood level is 2 – 5 mcg/ml)

Compatibility:

Stable in D_5LR, $D_5{}^1/_2NS$, D_5NS, D_5W, LR, ${}^1/_4NS$, NS.

Y-site administration:Compatible: amiodaronediltiazem, dobutamine, dobutamine with dopamine, dobutamine with nitroglycerin, dobutamine with nitroprusside, dopamine, dopamine with nitroglycerin, dopamine with nitroprusside, eptifibatide, heparin, labetalol, meperidine, morphine, nicardipine, nitroglycerin, nitroglycerin with nitroprusside, nitroprusside, potassium chloride, tirofiban, vasopressin,

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Magnesium

1. Class: Anticonvulsant; Replacement therapy
2. Actions: Decreases acetylcholine in motor nerve terminals, which is responsible for anticonvulsant properties; Reduces SA node impulse formation, prolongs conduction time in the myocardium, aids in maintaining the active transport mechanism at the cellular level.
3. Indications: Replacement therapy for hypomagensium states; Ventricular tachydysrhythmias (Tordsade de Pointes); eclampsia as an anticonvulsant; as a tocolytic for preterm labor; bronchospasm refractory to frontline agents.
4. Contraindications: Heart block, renal disease, toxemia of pregnancy in patients when delivery is imminent (within 2 hours of delivery)
5. Side effects: Hypotension, tachycardia, respiratory depression (maternal and neonatal, flushing, CNS depression an diaphoresis.
6. Pharmacokinetics: IV onset: 1 – 5 minutes, duration 30 minutes
7. Special Considerations:
   a. Administer slowly and monitor vital signs and cardiac rhythm closely.
   b. Be alert for orthostatic blood pressure changes
   c. If long-term administration is warranted, also monitor deep tendon reflexes.

Dosage

Replacement therapy: 1 gram/hour

Adults: Severe asthma/Torsades: 2gm mixed with 16ml NS (total 20ml) slow IVP over 5 min (never more than 1GM/min)
Preeclampsia/eclampsia: 2 gm mixed with 16ml NS slow IVP over 5 min. May repeat X 1 up to 4gm

Peds: Severe asthma/Torsades: 25mg/kg (max 2 gm) mixed with NS to total volume of 20ml) slow IV over 10 – 20 minutes (asthma) faster for Torsades

Compatibility:

Stable in D_5W, $D_{10}W$, $D_5{}^1/_4NS$, D_5NS, LR, NS

Y-site administration: Compatible:, dobutamine, esmolol, heparin, hydromorphone, insulin (regular), labetalol, meperidine, morphine, nicardipine, nitroprusside, potassium chloride, propofol,

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Mannitol

1. Class: Diuretic
2. Actions: Hyperosmolar agent that draws interstitial fluid into the intravascular space. This then increases the amount of fluid passing through the kidneys (enhances glomerular filtration rate), which decreases the reabsorption of sodium and thus promotes water loss.
3. Indications: Acute traumatic or atraumatic brain injury with evidence of increased intracranial pressure or herniation syndrome (Cushing's reflex).
4. Contraindications: Hypotension in the trauma patient, severe dehydration, acute pulmonary edema, anuria, history of allergy
5. Side effects: Hypotension, dehydration, acidosis, edema, headache, nausea, vomiting and electrolyte imbalances,
6. Pharmacokinetics: Onset of action: Diuresis: Injection: 1-3 hours; Reduction in intracranial pressure: ~15-30 minutes. Duration: Reduction in intracranial pressure: 1.5-6 hours
7. Special Considerations
   a. Use cautiously with patients with actual or suspected blood loss, hypotension or dehydration.
   b. Monitor BP, HR and cardiac rhythm
   c. Monitor rate, depth and rhythm of respirations
   d. Monitor urinary output
   e. Be alert for transient hypertension
   f. Watch for sign of hypokalemia: postural hypotension, malaise, fatigue, tachycardia, leg cramps and weakness
   g. Inspect for crystals prior to administration.
   h. Use filter-type administration set for infusion solutions containing mannitol ≥20%

Dosage
Adult: For elevations in intracranial or intraocular pressure: 1.5 – 2 g/kg IVP over 30 – 60 minutes.

Compatibility:
Stable in D_5W, D_5NS, LR, NS, R.

Y-site administration: Compatible: Allopurinol, amifostine, amphotericin B cholesteryl sulfate complex, aztreonam, bivalirudin, cisatracurium, cladribine, docetaxel, doripenem, etoposide phosphate, fenoldopam, fludarabine, fluorouracil, gallium nitrate, gemcitabine, hetastarch in lactate electrolyte injection (Hextend®), idarubicin, linezolid, melphalan, ondansetron, oxaliplatin, paclitaxel, palonosetron, pemetrexed, piperacillin/tazobactam, propofol, remifentanil, sargramostim, telavancin, teniposide, thiotepa, vinorelbine. **Incompatible:** Cefepime, doxorubicin liposome, filgrastim, pantoprazole.

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Methylprednisolone

1. Class: Corticosteroid
2. Actions: Intermediate-acting synthetic glucocorticoid used for its anti-inflammatory and immunosuppressive properties. Also alters the body's immune response to a variety of stimuli. Once recommended as a treatment fo acute spinal cord injury. More recent evidence has shown it to be ineffective and associated with multiple complications. Now it is only a treatment *option* for acute spinal cord injuries.
3. Indications: Primarily as an anti-inflammatory or immunosuppressant agent in the treatment of a variety of diseases including those of dermatologic, endocrine, GI, hematologic, allergic, inflammatory, neoplastic, neurologic, ophthalmic, renal, respiratory, and autoimmune origin. Prevention and treatment of graft-versus-host disease following allogeneic bone marrow transplantation. Off-label use: Acute spinal core injury
4. Contraindications: Suspected fungal infections, known hypersensitivity.
5. Side effects: Edema, hypokalemia, hypotension, hypertension, elevated blood glucose, CHF, delayed wound healing.
6. Pharmacokinetics: Onset: IM: 4 to 8 days; Intra-articular: 1 week; methylprednisolone sodium succinate is highly soluble and has a rapid effect by IM and IV routes
7. Special Considerations:
   a. Moniotr VS closely,
   b. May cause a steroid like glucose release, resulting in hyperglycemia in the nondiabetic patient.

Dosage

Acute spinal cord injury (off-label use): IV (sodium succinate): 30 mg/kg over 15 minutes, followed in 45 minutes by a continuous infusion of 5.4 mg/kg/hour for 23 hours. **Note:** Due to insufficient evidence of clinical efficacy (ie, preserving or improving spinal cord function), the routine use of methylprednisolone in the treatment of acute spinal cord injury is no longer recommended. If used in this setting, methylprednisolone should not be initiated >8 hours after the injury; not effective in penetrating trauma (eg, gunshot)

Anti-inflammatory or immunosuppressive: 10 to 40 mg over a period of several minutes and repeated IV or IM at intervals depending on clinical response; when high dosages are needed, give 30 mg/kg over a period ≥30 minutes and may be repeated every 4 to 6 hours for 48 hours.

Compatibility:

Stable in $D_5{}^1/_2NS$, D_5NS, LR, NS

Y-site administration: Compatible: amiodarone, dopamine heparin, meperidine, morphine, nicardipine,
. **Incompatible:** ondansetron, propofol.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Nicardepine

1. Class: Calcium channel blocker; antiyhypertensive
2. Actions: Calcium entry blocker that inhibits the influx of calcium ions into cardiac muscle and smooth muscle, thus affecting contractility. More selectively affects vascular smooth muscle than cardiac muscle; relaxes coronary vascular smooth muscle with little or no negative inotropic effect.
3. Indications: Rapid-acting vasodilator is effective in treatment of acute hypertensive emergency. Significantly decreases systemic vascular resistance. Can be used alone or with beta-blockers for chronic or stable angina. Can also be used either alone or with other antihypertensives for essential hypertension.
4. Contraindications: Hypersensitivity to nicardipine; advanced aortic stenosis; lactation.
5. Side effects: Drug-induced hypotension, palpitations, and tachycardia. It may also cause vertigo, headache, fatigue, anxiety, paresthesias, nervousness, nausea/vomiting, decreased hematocrit and hemoglobin.
6. Pharmacokinetics: Onset of action: oral 0.5 – 2 hours; IV 10 min. Duration: IV less than or equal to 8 hours.
7. Special Considerations:
   A. Monitor vital signs and cardiac rhythm closely (every 5 minutes)
   B. Exercise caution when administering the drug concurrently with other drugs that affect the hemodynamic stability of the patient.
   C. Use with caution in patients with CHF, hepatic impairment and pregnancy.

Dosage

5mg - 15mg/hr

Compatibility:
Stable in D_5W with KCl 40 mEq, $D_5{}^1/_2NS$, D_5NS, D_5W, NS; **incompatible** with sodium bicarbonate 5%; **variable stability (consult detailed reference):** LR, D_5LR, $^1/_2NS$.

Y-site administration: Compatible: calcium gluconate, cefazolin, chloramphenicol, cimetidine, clindamycin, diltiazem, dobutamine, dopamine, enalaprilat, epinephrine, esmolol, fentanyl, hydromorphone, labetalol, lidocaine, lorazepam, magnesium, methylprednisolone sodium succinate, midazolam, morphine, nesiritide, nitroglycerin, nitroprusside, norepinephrine, potassium chloride,

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Nitroprusside

1. Class: Antihypertensive; vasodilator
2. Actions: Causes peripheral vasodilation by direct action on venous and arteriolar smooth muscle, thus reducing peripheral resistance and decreasing systolic and diastolic pressures; will increase cardiac output by decreasing afterload.
3. Indications: Hypertensive emergency, especially in those patients with neurologic changes, such as hypertensive encephalopathy. It can also be used as adjunctive therapy in treatment of cardiogenic shock by decreasing left ventricular afterload.
4. Contraindications: Clinically significant hypotension, known allergy, lactation.
5. Side effects: Since the medication lowers blood pressure, accidental hypotension (which may be profound) can occur. Others include flushing, nausea and vomiting.
6. Pharmacokinetics: Onset 1 – 2 min, duration 1 – 10 min, half-life 4 days in patients
7. Special Considerations:
   A. **Except when used briefly or at low (<2 mcg/kg/minute) infusion rates, nitroprusside gives rise to large cyanide quantities. Do not use the maximum dose for more than 10 minutes; if blood pressure is not controlled by the maximum rate (ie, 10 mcg/kg/minute) after 10 minutes, discontinue infusion. Monitor for cyanide toxicity via acid-base balance and venous oxygen concentration; however, clinicians should note that these indicators may not always reliably indicate cyanide toxicity.** Patients at risk of cyanide toxicity include those who are malnourished, have hepatic impairment, or those undergoing cardiopulmonary bypass, or therapeutic hypothermia. Discontinue use of nitroprusside if signs and/or symptoms of cyanide toxicity (eg, metabolic acidosis, decreased oxygen saturation, bradycardia, confusion, convulsions) occur.
   B. Administer drug in a light-resistant container.
   C. Monitor the blood pressure closely, at least every 5 minutes.

Dosage

Initial: 0.3-0.5 mcg/kg/minute; may be titrated by 0.5 mcg/kg/minute every few minutes to achieve desired hemodynamic effect; maximum dose: 10 mcg/kg/minute. To avoid toxicity, some recommend a maximum dose of 2 mcg/kg/minute .

Compatibility:

Stable in D_5W (preferred), LR, NS; **Note:** Exposure to light causes decompensation regardless of the diluent

Y-site administration: Compatible: argatroban, , calcium chloride, calcium gluconate, diltiazem, dobutamine, dobutamine with dopamine, dobutamine with lidocaine, dobutamine with nitroglycerin, dopamine, dopamine with lidocaine, dopamine with nitroglycerin, enalaprilat, epinephrine, esmolol, heparin, insulin (regular), isoproterenol, labetalol, lidocaine, lidocaine with nitroglycerin, magnesium sulfate, midazolam, morphine, nesiritide, norepinephrine, nitroglycerin, potassium chloride, potassium phosphate, propofol

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Norepinephrine

1. Class: Sympathomimetic; alpha- and beta-adrenergic agonist
2. Actions: Causes increased contractility and heart rate by acting on beta receptors in the heart; also acts on alpha receptors, causing vasoconstriction in blood vessels; BP is elevated, coronary blood flow improves, cardiac out increases.
3. Indications: To treat patients in vasodilatory shock states such as septic and neurogenic shock, after adequate fluid volume replacement
4. Contraindications: Hypersensitivity, hypotension due to hypovolemic states, profound hypoxia or hypercarbia, patients with peripheral vascular or mesenteric thrombosis
5. Side effects: Ischemic injuries, severe hypertension, reflex bradycardia, arrhythmias, anxiety, transient headache, respiratory difficulties, severe peripheral vascular and visceral vasoconstriction, decreased renal perfusion, poor systemic blood flow despite normal BP, tissue hypoxia, lactic acidosis
6. Pharmacokinetics: Onset IV very rapidly, duration 1 -2 minutes, metabolized in the liver, excreted in the urine.
7. Special Considerations:
   A. Must be run on a pump
   B. Severe tissue necrosis will occur if medication infiltrates. Watch IV site closely.
   C. Moniotr BP every 2 minutes while titrating. Once desired dose is achieved and maintained, monitor BP every 5 minutes.
   D. Monitor heart rate, BP, ECG, urine output and neurologic status.
   E. Do not administer with alkaline solutions
   F. Use with extreme caution in patients taking MAO-Inhibitors; prolong hypertension may result from concurrent use.

Dosage
Typical therapeutic dose range is 8 – 12 mcg/min. Max dose 20mcg

Compatibility:
Stable in D_5LR, $D_5{}^1/_2NS$, D_5NS, D_5W, $D_{10}W$, LR, NS; **incompatible** with alkaline solutions

Y-site administration: Compatible: Amiodarone, argatroban, diltiazem, dobutamine, dopamine, doripenem, epinephrine, Esmolol, fentanyl, heparin, hydromorphone, inamrinone, labetalol, lorazepam, meropenem, micafungin, midazolam, morphine, nicardipine, nitroglycerin, nitroprusside, potassium chloride, propofol, vasopressin.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Oxytocin

1. Class: Oxytocic Hormone
2. Actions: Stimulates uterine contraction by activating G-protein-coupled receptors that trigger increases in intracellular calcium levels in uterine myofibrils. It also increases local prostaglandin production, further stimulating uterine contraction.
3. Indications: Control postpartum bleeding and hemorrhage. Also used for the induction of labor
4. Contraindications: Hypersensitivity, serum toxemia, cephalopelvic disproportion, fetal distress, hypertonic uterus.
5. Side effects:
   A. Mother: arrhythmias, hypertensive episodes, nausea, vomiting, ,uterine hypertonicity, uterine rupture, uterine spasm, postpartum hemorrhage, seizures, subarachoid hemorrhage, afibrinogenemia (clotting disorder that can be fatal).
   B. Fetus: arrhythmias, bradycardia, brain stem damage, neonatal seizure, neonatal jaundice, neonatal retinal hemorrhage, fetal death
6. Pharmacokinetics: IV Onset 1 min, duration 30 min, half-life 12 – 17 min.
7. Special Considerations:

Dosage

Postpartum uterine bleeding:

IM: 10 units after delivery of the placenta

IV: 10 to 40 units added to a running infusion solution depending on amount of infusion fluid remaining (maximum: 40 units in 1,000 mL of IV fluid); adjust infusion rate to sustain uterine contraction and control uterine atony

Compatibility:

Stable in D_5LR, $D_5{}^1/_4NS$, $D_5{}^1/_2NS$, D_5NS, D_5W, $D_{10}W$, LR, $^1/_2NS$, NS.

.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Propofol

1. Class: Central Nervous system Agent, Sedative-hypnotic
2. Actions: Sedative-hypnotic in fat emulsion; action is unknown but is thought to slow impulses in limbic system.
3. Indications: Sedation during mechanical ventilation.
4. Contraindications: Hypersensitivity to propofol or any if its components; hypersensitivity to eggs, egg products, soy beans or soy products
5. Side effects: Hypotension, altered level of consciousness, respiratory depression, bradycardia, tachycardia, pain at injection site, and acalculous Cholecystitis with prolonged use.
6. Pharmacokinetics: Onset of Action: Infusion (dose and rate dependent 9 – 51 seconds – average 30 seconds; Duration 3 – 10 min (dose and rate dependent)
7. Special Considerations:
   A. Patient must be intubated
   B. Monitor vital signs and cardiac rhythm closely
   C. Fluid bolus may be required for hypotension
   D. Analgesia may be needed additionally, because propofol has no analgesic properites

Dosage
Maintenance dosage: 5 – 50 mcg/kg/min

Compatibility:
Stable in D_5LR, $D_5{}^1/_4NS$, $D_5{}^1/_2NS$, D_5W, LR. Do not mix with other therapeutic agents prior to administration

Y-site administration:

Compatible: bumetanide, , calcium gluconate, dobutamine, dopamine, doxycycline, droperidol, epinephrine, esmolol, fentanyl, fluconazole, heparin, hydromorphone, insulin (regular), isoproterenol, ketamine, labetalol, magnesium sulfate, mannitol, meperidine, naloxone, nitroglycerin, nitroprusside, norepinephrine, potassium chloride, propranolol, sodium bicarbonate, succinylcholine,.

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Sodium Polystyrene Sulfonate (Kayexalate)

1. Class: Potassium-removing resin
2. Actions: Removes potassium by exchanging sodium for potassium primarily in the large intestine
3. Indications: Hyperkalemia in conjunction with other measures
4. Contraindications: Patients with hypokalemia, patients with a history of hypersensitivity to polystyrene sulfonate resins, obstructive bowel disease, neonates with reduced gut motility (postoperatively or drug induced) and oral administration in neonates
5. Side effects: Constipation, anorexia, nausea, vomiting, diarrhea, fecal impaction, gastric irritation, hypocalcemia, hypokalemia, hypomagnesemia, Na retention
6. Pharmacokinetics: Onset: 2 – 4 hours
7. Special Considerations:
   a. Review labs especially electrolytes and blood gases if available.
   b. Monitor BP, HR and cardiac rhythm

Dosage

Adult: Oral: 15 g 1-4 times/day Rectal: 30-50 g every 6 hours

Peds: Oral: 1 g/kg/dose every 6 hours Rectal: Children: 1 g/kg/dose every 2-6 hours (in small children and infants, employ lower doses by using the practical exchange ratio of 1 mEq K^+/g of resin as the basis for calculation)

Contact medical control immediately for any patient care concerns.

Tier II Critical Care Transport
Tirofibin

1. Class: Antiplatelet agent; Glycoprotein IIB/IIIA Inhibitor
2. Actions: A reversible antagonist of fibrinogen binding to the glycoprotein (BP IIb/IIIa receptor, the major platelet surface receptor involved in platelet aggregation. When administered intravenously, it inhibits *ex vivo* platelet aggregation in a dose and concentration dependent manner.
3. Indications: Indicated to reduce the rate of thrombotic cardiovascular events (combined endpoint of death, myocardial infarction, or refractory ischemia/repeat cardiac procedure) in patients with non-ST elevation acute coronary syndrome.
4. Contraindications: Active pathologic bleeding within 30 days; history of bleeding abnormalities; history of AV malformation, intracranial bleeding, brain tumor; history of recent trauma that increases risk of bleeding.
5. Side effects: Bleeding, including life-threatening hemorrhage, vasovagal reaction, vertigo, bradycardia, anemia, thrombocytopenia.
6. Pharmacokinetics: Onset: > 90% inhibition of platelet aggregation (reversible after discontinuation) seen within 10 minutes. Half-0life elimination: 2 hours. In about 90% of patients, *ex vivo* platelet aggregation return to near baseline in 4 – 8 hours after discontinuation.
7. Special Considerations:
   A. Monitor for bleeding
   B. Avoid automatic blood pressure cuffs
   C. Limit venipunctures

Dosage
Initially 0.4mcg/kg/min for 30 minutes, then followed by a 0.1mcg/kg/min continuous infusion.

Compatibility:

Y-site administration: Compatible: Amiodarone, argatroban, atropine, dobutamine, dopamine, epinephrine, heparin, lidocaine, midazolam, morphine, nitroglycerin, potassium chloride, propranolol.

.

Contact medical control immediately for any patient care concerns.