# *Memorial Medical Center EMS System*

## *Expanded Scope Protocol For Interfacility Transfer*

Developed June 2013

Updated April 2022

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.

# Expanded Scope QA/QI

Agency: _____ Date:_____ MICU:_____

Paramedic:_____ Lic. No.:_____

Transport from:_____ Transport to:_____

□ Vital signs documented at minimum every fifteen minutes.
- □ Change in vitals
- □ Documentation reveals change noted and care rendered accordingly

□ Documentation reveals ongoing assessment to monitor for
- □ Hypotension
- □ Extreme bradycardia or tachycardia, dysrhythmia
- □ Increasing chest pain
- □ Altered mental status or change in neuro exam
- □ Documentation of appropriate care rendered accordingly

□ Any alterations in IV status documented
- □ IV catheter unexpected discontinued
- □ Rate adjustments of infusions
- □ IV Medications within Advanced Scope Protocol
- □ Documentation of appropriate care rendered accordingly

□ Were ventilator settings changed during transport
- □ Reason and response documented

□ Was Medical Control or Ordering Physician contacted after EMS arrival
- □ Reason and response documented

□ Any unusual occurrences documented
- □ Issues reported to EMS System Coordinator

□ Chart reviewed by EMS System Coordinator
- □ Any abnormalities in transport require EMS MD review
- □ Follow up with transporting crew

# Thorocostomy Patient Transport

**INDICATIONS:**

1. Chest tube must be in place > 24 hours prior transport.
2. Must be either 8 years of age or older or 45 kg or more.
3. Patient transfer must be from licensed facility to another licensed facility.

**CONTRAINDICATIONS:**

1. Heimlich Valve

**PROCEDURE:**

1. Verify chest tube is securely attached to patient's chest prior to any patient movement by
    a. Confirming sutures to the skin are intact.
    b. Occlusive dressing attached to thoracostomy site, or secure taping of the chest tube to the chest skin.
    c. Inspect tube for any possible occlusions.
2. Verify the device the tube is connected to for drainage.
    a. Pleur-Evac.
3. For a patient on a Pleur-Evac
    a. Suction will be maintained during transport as it was at the facility.
    b. Note fluid and blood levels in the drainage and water seal compartments.
    c. Pleur-Evac must be maintained at a level lower than the point of insertion on the patient.
4. Chest tubes should be inspected every 15 minutes during transport to insure proper working condition.
5. Consult current patient orders for best patient positioning.
6. If the chest tube is not functioning and a tension pneumothorax is suspected, perform a needle decompression of the affected side. (See *Needle Thoracentesis Procedure*.)

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Ventilator Assisted Transport of Patients

**INDICATIONS:**

1. Advanced airway in place > 24 hours prior via endotracheal intubation or established tracheostomy.
2. Must be either 8 years of age or older or 45 kg or more.
3. Patient transfer must be from licensed facility to licensed facility.

**CONTRAINDICATIONS:**

1. Any acute airway case
2. Clinical signs of pneumothorax
3. Compromised cardiopulmonary status.

**PROCEDURE:**

1. Verify endotracheal tube placement.
    a. If unable to verify via auscultation of equal breath sounds
        i. Visualize endotracheal tube placement.
        ii. Consider tension pneumothorax or hemothorax and treat accordingly.
        iii. Notify ordering physician for review of patient case (ABG, CXR, etc) prior to transport.
2. Attach ventilator to gas source.
3. Set breaths per minute (BPM): Range is 8-26 BPM adjusted to achieve optimum total cycle time and maintain desired minute ventilation while maintaining plateau pressure $\leq$30 cm H20 and delta P $\leq$ 20 cm H20.
4. Set Tidal Volume (Vt): 8 ml/Kg of ideal body weight (IBW), while maintaining above plateau pressures and delta.
5. Set I:E ratio: The I:E ratio should be optimized along with total cycle time (TCT) to provide optimum mean airway pressure, lung filling, and minimizing air-trapping (auto-PEEP).
6. Verify ventilator is delivering oxygen adequately (look, listen, and feel) to the device.
7. Attach ventilator tubing to patient.
8. Verify patient ventilatory status:
    a. Rise and fall of chest
    b. Equal breath sounds
    c. Capnography waveform
    d. Pulse oximetry
    e. Updated vital signs
9. Ventilatory flow sheets must be completed and attached to medical record.
10. A Bag valve mask must be maintained with the patient at all times.

# Ventilator Assisted Transport of Patients

**ADDITIONAL REQUIREMENTS:**

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1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Ventilator Assisted Transport of Patients

Patient's Name: _____ Date: _____

Diagnosis: _____

Sending Facility: _____

Receiving Facility: _____

Transporting Agency: _____ MICU#_____

Report Received From:_____

Paramedic:_____ Lic No._____

**Ventilator Settings**

Mode: Control _____ Assist/Control (AC) _____ SIMV _____ PCV _____

Pressure Support _____ CPAP _____ Bi PAP _____

Other _____

Tidal Volume _____ Respiratory Rate _____ FIO2 _____ I E Ratio _____

Was a sedative agent used prior to transport? Yes _____ No _____

If yes, list agent _____

Was a paralytic agent used prior to transport? Yes _____ No _____

If yes, list agent _____

Copies of this form and the MICU form must be sent to EMS office within 24 hours.

# Heparin Sodium

**CLASS:**

- Anticoagulant

**ACTION(S):**

- Functions as an anticoagulant by accelerating neutralization of activated clotting factors, hence inhibiting the clotting of blood and the formation of fibrin clots.

**INDICATIONS:**

1. Concurrent usage with administration of TPA in the acute MI patient
2. Treatment of pulmonary embolism and a-fib with embolization
3. Treatment of peripheral arterial embolism
4. Treatment of venous thrombi and its extension
5. Prevention of re-thrombosis or re-occlusion during MI after thrombolytic therapy

**CONTRAINDICATIONS:**

**Absolute:**

1. Severe thrombocytopenia
2. Uncontrolled active bleeding (except when known to be from DIC [disseminated intravascular coagulation])
3. Sensitivity to Heparin

**Relative:**

1. Any disease where risk of hemorrhage may be increased
2. Aneurysm
3. Severe hypertension
4. Diverticulitis or ulcerative colitis
5. Severe hepatic disease or renal disease
6. Sub acute bacterial endocarditis
7. Following major surgery or lumbar puncture (spinal tap)

**COMPLICATIONS/ADVERSE REACTIONS:**

1. Local site irritation
2. Hypersensitivity
3. Anaphylactic reaction
4. Adrenal hemorrhage

**PRECAUTIONS:**

Use with caution in the following patients:

1. Pregnant patients
2. Alcoholics (due to decreased hepatic function)
3. Elderly (due to decreased hepatic & renal function and increased injury capability
4. Avoid IM injections or other procedures that may cause bleeding.
5. Move patients gently to avoid bruising or bleeding

# Heparin Sodium

**SIDE EFFECTS:**

- Fever
- Bruising
- Oozing of blood

**EQUIPMENT:**

- Infusion Pump

**HOW SUPPLIED:**

- 25,000 units in 500 mL 0.45% NS (50u/mL)
- 25,000 units in 500mL $D_5W$ (50u/mL)
- 25,000 units in 250mL $D_5W$ (100u/mL)
- 1,000 units in 500mL NS (2u/mL)

**DOSE:**

- 5,000 units (loading dose)
- Maintenance infusion is based on PTT results but is usually around 1,000 units/hr (dose will be determined by transferring facility)

**STANDING ORDERS:**

1. *Routine ALS Care*
2. **Verify** initial dose and infusion rate as well as total time at the transferring facility prior to departure.
3. Verify lab values (platelet count, coagulation studies) prior to departure (if available).
4. **Monitor patient closely** en route.
5. If uncontrolled bleeding or allergic reaction develops, immediately discontinue the infusion, provide necessary treatment and **contact Medical Control**.
6. Any other change in rate/dosage of Heparin during interfacility transfer requires **Medical Control order**.
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
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# Nitroglycerin Infusion

**CLASS:**
- Nitrate

**ADDITIONAL NAMES:**
- Nitrostat

**ACTION:**
- Vasodilator and vascular smooth muscle relaxant
- Reduces myocardial oxygen consumption, preload & afterload
- Metabolized by the liver
- Excreted in urine
- Half-life of 1-4 minutes
- IV onset of action – immediate; duration – variable

**INDICATIONS:**
1. Unstable angina pectoris if hemodynamically stable
2. Congestive heart failure (CHF) in settings of acute MI that are hemodynamically stable
3. Hypertensive emergencies

**CONTRAINDICATIONS:**
1. Sensitivity to nitrates
2. Increased ICP (*e.g.* head trauma, hemorrhagic stroke or other cerebral hemorrhage)
3. Uncorrected hypovolemia
4. Use of *sildenafil citrate* (Viagra) within 48 hours

**COMPLICATIONS/ADVERSE REACTIONS/SIDE EFFECTS:**
1. Hypotension, especially postural (from vasodilation)
2. Dizziness/syncope (from hypotension)
3. Pallor/sweating (from hypotension)
4. Temporary pulsating headache (from vasodilation)
5. Nausea/vomiting
6. Tachycardia (in response to hypotension)
7. Paradoxical bradycardia (rare)
8. Rash or anaphylaxis

**PRECAUTIONS:**
Use with caution in the following patients:
1. Pregnant or lactating patients
2. Hepatic or renal disease
3. Pericarditis
4. Postural hypotension

**EQUIPMENT:**
- Infusion Pump

# Nitroglycerin Infusion

**HOW SUPPLIED:**

- 25mg in 250mL $D_5W$
- 50mg in 250mL $D_5W$
  *Note*: Nitroglycerin infusions MUST be in a glass bottle with **polyethylene tubing**.

**DOSE:**

- 5-50mcg/minute

**STANDING ORDERS:**

1. *Routine ALS Care*
2. **Verify** concentration & dose, infusion rate as well as total time and vital sign parameters at the transferring facility prior to departure.
3. Nitroglycerin infusion should have its own IV site. **No IV push drugs can be administered through this line**. If absolutely necessary, NTG is compatible with Heparin (and Lidocaine).
4. Monitor patient closely en route and repeat vitals signs ***every 15 minutes.***
5. Titrate NTG drip to effect (patient's pain relief) by increasing in 10mcg increments every 3-5 minutes until a response is noted.
6. **BE ALERT FOR DEVELOPING HYPOTENSION**. Titrate down in 10mcg increments for hypotension. Monitor vital signs every 3-5 minutes after an increase in dose.
7. **Notify Medical Control** in the following circumstances
   **a.** Chest pain re-occurs en route
   **b.** Vital signs deviate from the predetermined parameters set forth by the transferring hospital
   **c.** Any titration of the NTG drip (up or down)
8. Maximum infusion of NTG not to exceed **50mcg/minute**
9. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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A medical command physical must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
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# Dopamine Infusion

**CLASS:**
- Sympathomimetic

**ACTION:**
- Alpha- and beta-adrenergic agonist, resulting in increased cardiac contractility and myocardial workload as well as peripheral vasoconstriction (both venous & arterial)

**INDICATIONS:**
1. Correction of hemodynamic imbalance in hypoperfusion syndromes other than volume deficit
2. Cardiac dysfunction due to AMI
3. Cardiac dysfunction due to CHF
4. Poor perfusion due to sepsis
5. Neurologically induced vasodilation (neurogenic shock)
6. Renal failure

**CONTRAINDICATIONS:**
1. Uncontrolled tachycardia
2. Ventricular irritability
3. Hypertension
4. Hypoperfusion from volume deficit

**COMPLICATIONS/ADVERSE REACTIONS/SIDE EFFECTS:**
1. Tachycardia
2. Hypertension
3. Ventricular irritability
4. Angina
5. Anxiety
6. Decreased peripheral perfusion
7. Tissue necrosis with infiltration of IV line

**PRECAUTIONS:**
Use with caution in the following patients:
1. Children
2. Patients with occlusive vascular disease (or other types of peripheral vascular insufficiency)

**EQUIPMENT:**
- Infusion Pump

# Dopamine Infusion

**HOW SUPPLIED:**

- 400mg in 250mL $D_5W$
- 800mg in 250 mL $D_5W$

**DOSE:**

- *Dopaminergic (renal) dose:* 2-5mcg/kg/min
- *Beta agonist (cardiac) dose:* 5-15mcg/kg/min
- *Alpha agonist (vasopressor) dose:* >15mcg/kg/min

**STANDING ORDERS:**

1. *Routine ALS Care*
2. Verify patient's **weight (in *kilograms*)**
3. **Verify** concentration & dose, infusion rate as well as total time and vital sign parameters at the transferring facility prior to departure.
4. Incompatible with Sodium Bicarb. **No IV push drugs can be administered through this line**. Monitor patient closely for rhythm changes en route and repeat vitals signs ***every 15 minutes.***
5. Monitor urine output (should be at least 25mL/hr)
6. **Notify Medical Control** if complications arise.
7. Maximum infusion of Dopamine not to exceed **50mcg/kg/minute.**
8. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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# IV Fluids with Potassium Chloride (KCl) Added

**CLASS:**

- Electrolyte

**ACTION:**

- Participates in several physiological processes in the body including the transmission of nerve impulses, the maintenance of normal renal function & intracellular toxicity and the contraction of skeletal, cardiac & smooth muscle.

**INDICATION:**

- Hypokalemia

**CONTRAINDICATION:**

- Hyperkalemia

**COMPLICATIONS/ADVERSE REACTIONS:**

1. Burning along the vein of infusion
2. Local site irritation
3. Lower extremity weakness

**PRECAUTIONS:**

1. Alkalosis/acidosis (serum potassium levels may not represent total body potassium)
2. Acidosis (risk of hyperkalemia)
3. Burn patients (risk of hyperkalemia due to extensive tissue breakdown)
4. Concomitant use of ACE inhibitors (inhibits aldosterone production resulting in potassium retention)
5. Concomitant use of potassium-sparing diuretics (risk of hyperkalemia)
6. Acute dehydration (risk of hyperkalemia)
7. Chronic renal failure (risk of hyperkalemia)
8. Patients taking Digoxin or suspected of having Digoxin toxicity.

# IV Fluids with Potassium Chloride (KCl) Added

**SIDE EFFECTS:**

1. Abdominal pain
2. Nausea/vomiting
3. EKG changes associated with hyperkalemia:
    - Tall, tented (peaked) T waves
    - Depressed ST segments
    - Prolonged PR intervals
    - Flattened P waves
    - Prolonged QRS & QT intervals
    - Heart block
    - Bigeminy
    - V-fib/cardiac arrest

**EQUIPMENT:**

- Infusion Pump

**HOW SUPPLIED:**

- Potassium chloride (KCl) should be diluted in a 500 mL bag of Normal Saline (NS)
- **KCI concentrations may not exceed 40 mEq in 500 mL NS**

**DOSE:**

- Maximum dose of 10 mEq/hr

- **KCl infusion must be initiated at the transferring hospital and can be run through either a central or peripheral line.**

# IV Fluids with Potassium Chloride (KCl) Added

**STANDING ORDERS:**

1. *Routine ALS Care*
2. **Verify** initial dose, infusion rate and concentration as well as total time at the transferring facility prior to departure.
3. Verify lab values (serum electrolytes, BUN & creatinine) prior to departure (if available).
4. Incompatible with Phenergan (promethazine), Sodium Bicarbonate, Sodium Nitroprusside and Atropine.
5. Assess IV insertion site for any redness, swelling or tenderness. If any one of these is present, stop the infusion, discontinue IV. Establish a new IV site and restart infusion. Notify the receiving hospital of the area of the previous IV site and reason for discontinuing the original IV.
6. **Monitor patient closely** en route. If signs & symptoms of hyperkalemia occur, stop the infusion and **contact Medical Control.**
7. **Monitor urinary output** (long-distance transports) and **contact Medical Control** if urinary output is < 30mL/hr for two (2) consecutive hours.
8. Any change in rate/dosage of KCl during Interfacility transfer requires **Medical Control Order**.

**ADDITIONAL REQUIREMENTS:**

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# Amiodarone IV Infusion

**CLASS:**
- Class III antiarrythmic

**ADDITIONAL NAMES:**
- Cardone

**ACTION:**
- Prolongs the duration of action potential and effective refractory period. Noncompetitive alphas and Beta adrenergic inhibition. It increases the PR and QT intervals and decreases sinus rate. Also effective for atrial arrhythmias in patients with impaired left ventricular function when digoxin has proven ineffective.

**INDICATION:**
1. Treatment and prophylaxis of frequently recurring ventricular fibrillation and hemodynamically unstable ventricular tachycardia.

**CONTRAINDICATION:**
- Known hypersensitivity.
- Cardiogenic shock.
- Marked Sinus Bradycardia and 2$^{nd}$ and 3$^{rd}$ heart block without functioning pacemaker.
- Severe liver disease.
- Hypotension.

**COMPLICATIONS/ADVERSE REACTIONS:**
**Cardiovascular**
1. Vasodilation and hypotension
2. Torsades de Pointes
3. Sinus arrest
4. Bradycardia
5. CHF
6. Prolonged QT interval
7. Negative inotropic effects

**Pulmonary**
1. Pulmonary toxicity
2. Progressive dyspnea
3. Fatigue
4. Cough
5. Pleuritic pain
6. Fever
7. Pulmonary edema

# Amiodarone IV Infusion

**PRECAUTIONS:**

1. Use with caution in renal failure patients
2. Incompatible with Heparin Sodium

**EQUIPMENT:**

- Infusion pump

**HOW SUPPLIED:**

- 150mg/ 3 mL
- 150mg/ 100 mL D5W
- 360 mg/ 100 mL D5W

**DOSE:**

- Loading dose of 150 mg or 300 mg infusion to be completed at transferring facility.
- Slow infusion of 360 mg over 6 hours at 1 mg/ min.
- Maintenance infusion of 540 mg over 18 hours at 0.5 mg/ min.

**STANDING ORDERS:**

1. *Routine ALS Care*.
2. **Verify** initial dose completion and infusion rate as well as total time at the transferring facility prior to departure.
3. Verify Potassium, Magnesium and liver function labs, if available.
4. Monitor patient closely enroute.
5. Notify Medical Control if heart rate less than 60 or B/P less than 90.
6. Consider IV bolus if hypotension occurs.
7. Any change in rate/dosage of Amiodarone during Interfacility transfer requires **Medical Control Order**.
8. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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# Cardizem IV Infusion

**CLASS:**
- Calcium Channel Blocker

**ADDITIONAL NAMES:**
- Diltiazem

**ACTION:**
- Inhibits calcium ion influx across the cell membrane in cardiac and vascular smooth muscle. Produces relaxation of coronary vascular smooth muscle and dilates coronary arteries. Slows SA/AV node conduction and dilates peripheral arteries.

**INDICATION:**
1. Atrial fibrillation with rapid ventricular response
2. Atrial Flutter
3. PSVT
4. Chronic unstable angina pectoris

**CONTRAINDICATION:**
- 2nd or 3rd heart bock
- Cardiogenic shock
- Sick Sinus Syndrome
- Hypotension of 90mmHg Systolic
- Wolff-Parkinson-White Syndrome

**COMPLICATIONS/ADVERSE REACTIONS:**

**Cardiovascular**
1. Hypotension
2. CHF
3. Ventricular or atrial arrhythmias
4. Chest pain
5. Junctional or AV dissociation
6. Facial Flushing

**Central Nervous System**
1. Dizziness
2. Parasthesias
3. Headache
4. Weakness
5. Visual disturbance

**Dermatologic**
1. Injection site reaction (itching, burning)
2. Sweating

# Cardizem IV Infusion

**SIDE EFFECTS:**

1. Constipation
2. Nausea
3. Vomiting
4. Dry Mouth

**EQUIPMENT:**

- Infusion pump

**HOW SUPPLIED:**

- 25mg/ 5 mL
- 100mg/ 100mL NS
- 100mg/ 100mL D5W

**DOSE:**

- 0.25mg/kg IVP over 2 minutes with second dose (if no response after fifteen minutes) of 0.35 mg/kg over 2 minutes to be given at transferring facility.
- 5-15 mg/hr (dose will be determined by transferring facility)

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute.
4. Notify Medical Control if heart rate greater than 150 or persistently less than 80 or B/P less than 90.
5. Consider IV bolus if hypotension occurs.
6. Any change in rate/dosage of Cardizem during Interfacility transfer requires **Medical Control Order.**
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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# Antibiotic Infusions

**CLASS:**

- Antibiotic

**ACTION:**

- Treatment for known infection. Prophylactic measure for patient who may undergo surgical procedure or who has had recent exposure that indicates likelihood of resulting infection.

**INDICATION:**

1. Pre-existing, diagnosed infection or suspected infection.
2. Exposure that creates likelihood of resulting infection.

**CONTRAINDICATION:**

- Known allergy to the medication

**COMPLICATIONS/ADVERSE REACTIONS:**

1. Allergic reactions
2. Ototoxicity
3. Nephrotoxicity (aminoglycocides)

**PRECAUTIONS:**

1. Speed of infusion

**SIDE EFFECTS:**

1. Localized reaction to infusion: redness/ burning at site of infusion.

**EQUIPMENT:**

- Antibiotic infusions may be administered by pump or by gravity set rate.

**HOW SUPPLIED:**

- Varies by antibiotic

**DOSE:**

- Dependent on the specific antibiotic.

# Antibiotic Infusions

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Antibiotics need to be started 15 minutes or more before the start of the transport.
3. Verify infusion rate as well as total time at the transferring facility prior to departure.
4. Monitor patient closely enroute.
5. Notify Medical Control if signs and symptoms of shock or allergic reaction.
6. Follow A*naphylaxis Protocol* if needed for signs of allergic reaction and/ or shock.
7. If infusion is completed during transport, antibiotics should be discontinued and line kept open by infusing .9% Normal Saline at TKO rate.
8. Consider IV bolus if hypotension occurs.
9. Any change in rate/dosage of antibiotics during Interfacility transfer requires **Medical Control Order.**
10. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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# tPA Infusions

**CLASS:**

- Thrombolytic

**ADDITIONAL NAMES:**

- Activase
- Alteplase

**ACTION:**

- Dissolve clot in treatment of ischemic stroke.

**INDICATION:**

1. Ischemic stroke diagnosed by CT.

**CONTRAINDICATION:**

- Nasogastric Tube
- Evidence/ suspicion of cerebral hemorrhage
- Intracranial or intraspinal surgery, serious head trauma or previous stroke within last 3 months
- History of intracranial hemorrhage
- Uncontrolled hypertension ( > 185mmHg Systolic, > 110 mmHg Diastolic)
- Seizure at the onset of stroke
- Active internal bleeding
- Intracranial neoplasm, arteriovenous malformation, or aneurysm
- History of Pradaxa use
- Known bleeding diathesis including but not limited to:
    - Current use of oral anticoagulants or an International Normalized Ratio (INR) >1.7 or a prothrombin time (PT) > 15 seconds
    - Administration of heparin or Low Molecular Weight Heparin (Lovenox) within 48 hours preceding the onset of stroke and have an elevated partial thromoplastin time (aPTT) at presentation
    - Platelet count <100,000mm3

**COMPLICATIONS/ADVERSE REACTIONS:**

1. Bleeding
2. Reperfusion arrhythmias
3. Elevated temp
4. Hypotension
5. Anaphylactic Reaction

**PRECAUTIONS:**

1. tPA must be started within 4.5 hours of onset of symptoms.
2. Do not take blood pressure in the arm tPA is infusing in.
3. Patient must be NPO for 24 hours and until swallow study is done.

# tPA Infusions

**SIDE EFFECTS:**

1. Bleeding at venipuncture sites.
2. Hematuria

**EQUIPMENT:**

- Infusion Pump

**HOW SUPPLIED:**

- 100mg/100mL bedside premix for infusion

**DOSE:**

- Loading dose of 10% of total infusion given over 1 minute to be completed at transferring facility.
- Infusion of 0.9mg/kg to be infused over 60 minutes.

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute for signs of hypertension and bleeding.
4. If infusion is completed during transport, tPA should be discontinued and line kept open by infusing .9% Normal Saline at TKO rate.
5. Consider IV bolus if hypotension occurs.
6. Any change in rate/dosage of tPA during Interfacility transfer requires **Medical Control Order.**
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Levophed

**CLASS:**
- Sympathomimetic

**ADDITIONAL NAMES:**
- Norepinepherine

**ACTION:**
- Alpha adrenergic and some Beta adrenergic agonist to cause peripheral vasoconstriction, increase blood pressure and increase heart rate to lesser degree

**INDICATION:**
1. Neurogenic shock
2. Septic shock
3. Hypotension refractory to other sympathomimetics

**CONTRAINDICATION:**
- Hypotension from hypovolemia

**COMPLICATIONS/ADVERSE REACTIONS:**
1. Headache

**PRECAUTIONS:**
1. Alkaline solutions can deactivate.
2. Requires constant monitoring of blood pressure.
3. Extravasation can cause tissue necrosis.

**SIDE EFFECTS:**
1. Anxiety
2. Palpitations
3. Hypertension

**EQUIPMENT:**
- Infusion pump

**HOW SUPPLIED:**
- 4 mg/ 250 mL (typical)
- 8 mg/ 250 mL (double strength)

# Levophed

**DOSE:**

- 0.5-40 mcg/ minute. Typical starting dose is 5 mcg/min. Max 40 mcg/min.
- 4 mg in 250 ml of D5W, giving a concentration of 15 mcg/mL (Typical)
- MEMS does **not** use weight based dosing. If EMS responds for an inter-facility transport and finds dosing or concentrations other than as noted above, Contact Medical Control for orders.

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute.
4. Consider an IV fluid bolus if hypotension develops.
5. Contact Medical Control if the heart rate is greater than 150 bpm or persistently less than 60 bpm or a SBP less than 90 for 2 consecutive readings 5 minutes apart.
6. Any change in rate/dosage of Levophed during inter-facility transfer requires Medical Control Order. Typical titration orders would be increasing 2.5-5mcg/min every 5 minutes to maintain SBP>90mmHg.
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient is hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Protonix

**CLASS:**
- Proton Pump Inhibitor

**ADDITIONAL NAMES:**
- Pantoprazole

**ACTION:**
- Decreases secretion of gastric acid and chronic reflux

**INDICATION:**
1. Patients with Upper GI Bleed

**CONTRAINDICATION:**
- Allergy to drug or drug class

**COMPLICATIONS/ADVERSE REACTIONS:**
1. Jaundice
2. GI upset
3. CNS Symptoms in elderly

**PRECAUTIONS:**
- Hypersensitivity to Proton Pump Inhibitor drug class.

**SIDE EFFECTS:**
1. Anaphylaxis
2. Rash

**EQUIPMENT:**
- Infusion Pump

**HOW SUPPLIED:**
- 40 mg/50 mL
- 80 mg/ 100 mL

**DOSE:**
- Bolus of 80 mg over 5 minutes given prior to infusion.
- IV Infusion of 8 mg/ hour.

**STANDING ORDERS:**
1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute.

# Protonix

4. Notify Medical Control if heart rate greater than 150 or persistently less than 80 or B/P less than 90.
5. Consider IV bolus if hypotension occurs.
6. Any change in rate/dosage of Protonix during Interfacility transfer requires **Medical Control Order.**
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Narcan

**CLASS:**

- Narcotic Antagonist

**ADDITIONAL NAMES:**

- Naloxone

**ACTION:**

- Reverses the effects of narcotics

**INDICATION:**

1. Narcotic overdoses from
    a. Codeine
    b. Demerol
    c. Dilaudid
    d. Fentanyl
    e. Heroin
    f. Lortab
    g. Methadone
    h. Morphine
    i. Paregoric
    j. Percodan
    k. Tylox
    l. Vicodin
2. To rule out possible overdose of unknown origin

**CONTRAINDICATION:**

- None

**COMPLICATIONS/ADVERSE REACTIONS:**

1. Use with caution for patients with long term drug use and/ or prescription opiod use.

**PRECAUTIONS:**

1. Be alert for patient reaction to medication.

**SIDE EFFECTS:**

1. Allergic reaction
2. Anaphylaxis

# Narcan

**EQUIPMENT:**

- Infusion Pump

**HOW SUPPLIED:**

- 2mg/500mL
- 4mg/250mL

**DOSE:**

- Typical infusion of 0.5mg/hour.

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute.
4. Notify Medical Control if heart rate greater than 150 or persistently less than 80 or B/P less than 90.
5. Consider IV bolus if hypotension occurs.
6. Any change in rate/dosage of Narcan during Interfacility transfer requires **Medical Control Order.**
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Dobutamine

**CLASS:**
- Sympathomimetic

**ADDITIONAL NAMES:**
- Dobutex

**ACTION:**
- Increases cardiac contractility
- Some chronotropic activity

**INDICATION:**
1. Short term management of CHF
2. Decreased cardiac output
3. Cardiogenic shock

**CONTRAINDICATION:**
- Should only be used on patients with adequate heart rate
- Tachydysrhythmias
- Hypertrophic subaortic stenosis

**COMPLICATIONS/ADVERSE REACTIONS:**
1. Infusion site reaction

**PRECAUTIONS:**
1. Ventricular irritability
2. Use with caution in myocardial infarction
3. Can be deactivated by alkaline solutions

**SIDE EFFECTS:**
1. Increased heart rate
2. Palpitations
3. Dyspnea
4. Hypokalemia

**EQUIPMENT:**
- Infusion Pump

**HOW SUPPLIED:**
- 250 mg/ 250 mL

**DOSE:**
- 2.5-20 mcg/kg/min
- Reduce does by 5mcg/kg/min in the event of tachydysrhythmias

# Dobutamine

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute.
4. Notify Medical Control if heart rate greater than 150 or persistently less than 80 or B/P less than 90.
5. Consider IV bolus if hypotension occurs.
6. Any change in rate/dosage of Dobutamine during Interfacility transfer requires **Medical Control Order.**
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# N-Acetylcysteine

**CLASS:**
- Antidote

**ADDITIONAL NAMES:**
- NAC
- Acetadote
- Acetylcysteine 20%

**ACTION:**
- Protects the liver by maintaining or restoring glutathione levels or by acting as an alternate substrate for conjunction with, and therefore detoxification of, the acetaminophen reactive metabolite

**INDICATION:**
1. Acetaminophen toxicity
2. Acute liver failure

**CONTRAINDICATION:**
- Sensitivity to acetylcysteine

**COMPLICATIONS/ADVERSE REACTIONS:**
1. Anaphylaxis
2. Bronchospasm
3. Rash
4. Nausea
5. Vomiting

**PRECAUTIONS:**
1. Use with caution in asthma patients

**SIDE EFFECTS:**
1. Tachycardia
2. Hypotension
3. Vomiting

**EQUIPMENT:**
- Infusion Pump

**HOW SUPPLIED:**
- 30 mL vials
- Given as infusion in D5W

# N-Acetylcysteine

**DOSE:**

- Loading dose: 150 mg/kg in 200 mL over 60 minutes (200 mL/hr)
- Maintenance doses: 50 mg/kg in 500 mL over 4 hours (125 mL/hr), followed by 100mg/kg in 1,000 mL over 16 hours (62.5 mL/hr)

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Verify infusion rate as well as total time at the transferring facility prior to departure.
3. Monitor patient closely enroute.
4. Notify Medical Control if heart rate greater than 150 or persistently less than 80 or B/P less than 90.
5. Consider IV bolus if hypotension occurs.
6. Any change in rate/dosage of N-Acetylcysteine during Interfacility transfer requires **Medical Control Order.**
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Blood Products

**CLASS:**
- Blood Components

**ADDITIONAL NAMES:**
- FFP
- PRBCs

**ACTION:**
- Replace cells (fresh frozen plasma or packed red blood cells) needed by the body

**INDICATION:**
1. Hemorrhagic shock
2. Anticoagulant reversal
3. Symptomatic anemia

**CONTRAINDICATION:**
- Patient refusal

**COMPLICATIONS/ADVERSE REACTIONS:**
1. Transfusion reaction. Severe reactions will usually manifest during initial 50cc or less of infusion.
2. ABO incompatibility

**PRECAUTIONS:**
1. Too fast of infusion can produce volume overloaded state.

**SIDE EFFECTS:**
1. Transfusion reaction

**EQUIPMENT:**
- Infusion Pump

**HOW SUPPLIED:**
- 250-300 mL per unit infusion

**DOSE:**
- 1 unit
- Rate based on situation

# Blood Products

**STANDING ORDERS:**

1. Blood infusions must be started at least 15 minutes before the transport AND at least 50 CC must be infused before the transport can begin.
2. *Routine ALS Care.*
3. Verify infusion rate as well as total time at the transferring facility prior to departure.
4. Monitor patient closely enroute.
5. Temperature must be take every 15 minutes.
6. Notify Medical Control if heart rate greater than 150 or persistently less than 80 or B/P less than 90.
7. Consider IV bolus if hypotension occurs.
8. Any change in rate/dosage of blood products during Interfacility transfer requires **Medical Control Order.**
9. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.
10. Tubing must be changed every 2 units or after every 4 hours of use. Tubing must be discarded immediately following completion of transfusion.
11. If signs of transfusion reaction, infusion should be stopped and tubing should be removed. Tubing and remaining blood should be transported to destination facility for evaluation.
    a. Signs of a transfusion reaction include:
        i. Temperature
        ii. Hypertention/ Hypetention
        iii. Dyspnea
        iv. Rash
        v. Itching
        vi. Hives
    b. Treat symptoms based on appropriate protocol which may include
        i. Benadryl 25-50 mg IV
        ii. IV Fluids
        iii. Epinephrine 0.15-0.3 mg IM

**ADDITIONAL REQUIREMENTS:**

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A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.

# Blood Products

3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Multivitamin Banana Bag

**CLASS:**
- Vitamin

**OTHER NAMES:**
Rally Packs

**ACTION(S):**

Replenishes vitamins/ minerals and fluids lost in acute alcohol consumption.

**INDICATIONS:**
1. Vitamin and electrolyte deficiencies in chronic alcohol consumption

**CONTRAINDICATIONS:**

**Absolute:**
1. True allergy to any component of the preparation

**COMPLICATIONS/ADVERSE REACTIONS:**
None

**PRECAUTIONS:**

Use with caution in the following patients:
1. May not provide sufficient quantities of Thiamine for patient with Wernicke's Encephalopathy

**SIDE EFFECTS:**
- None

**EQUIPMENT:**
- May run to gravity

**HOW SUPPLIED:**
- 1 L 0.9 Normal Saline
  - 1 amp multivitamin
  - 1 mg Folate
  - 100 mg Thiamine
  - In some situations Magnesium is added
    - Dose may vary, typically 3g
    - If Magnesium is added, must be run by IV pump

**DOSE:**
- 1 L over 2 or more hours

# Multivitamin Banana Bag

**STANDING ORDERS:**

1. *Routine ALS Care*
2. **Verify** initial dose and infusion rate as well as total time at the transferring facility prior to departure.
3. Verify lab values (platelet count, coagulation studies) prior to departure (if available).
4. **Monitor patient closely** en route.
5. If uncontrolled bleeding or allergic reaction develops, immediately discontinue the infusion, provide necessary treatment and **contact Medical Control**.
6. Any other change in rate/dosage of Multivitamin Banana Bag during interfacility transfer requires **Medical Control order**.
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

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A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
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# Octreotide

**CLASS:**

- Synthetic hormone
- Antidiarrheal Somatostatin Analog

**Additional Names**
Sandostatin
Sandostatin LAR

**ACTION(S):**
Long Acting octopeptide with pharmacologic actions mimicking those of the natural hormone somatostatin

**INDICATIONS:**

1. GI Bleed
2. Refractory hypoglycemia in combination with Dextrose

**CONTRAINDICATIONS:**

**Absolute:**

1. Known allergy to Octreotide
2. Patients with known Bradycardia or ECG changes and arrhythmias
3. Dialysis

**Relative:**

1. Dosage may be reduced for renal failure/ dialysis patients
2. Patients with known bradycardia or ECG changes/ arrhythmias

**COMPLICATIONS/ADVERSE REACTIONS:**

1. May affect insulin dosing

**PRECAUTIONS:**

Use with caution in the following patients:

1. May enhance toxicity of QTc prolonging agents
2. Multiple drug incompatibilities

**SIDE EFFECTS:**

- Abdominal or stomach pain
- Blurred vision
- Dizziness
- Dry mouth
- Fainting
- Fast, slow, or irregular heartbeat
- Flushed, dry skin

# Octreotide

Side Effects (continued)

- Muscle cramps and stiffness
- Nausea
- Severe stomach pain with nausea and vomiting
- Sweating
- Hyperglycemia

**EQUIPMENT:**

- IV infusion pump

**HOW SUPPLIED:**

- 500 mcg/100 mL

**DOSE:**

- 25-100 mcg/hr

**STANDING ORDERS:**

1. *Routine ALS Care*
2. **Verify** initial dose and infusion rate as well as total time at the transferring facility prior to departure.
3. Verify lab values (platelet count, coagulation studies) prior to departure (if available).
4. **Monitor patient closely** en route.
5. If uncontrolled bleeding or allergic reaction develops, immediately discontinue the infusion, provide necessary treatment and **contact Medical Control**.
6. Any other change in rate/dosage of Octreotide during interfacility transfer requires **Medical Control order**.
7. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control.

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient in hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
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4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# Insulin

**CLASS:**
- Hormone
- Hypoglycemic agent

**ADDITIONAL NAMES**
- Humulin

**ACTION:**
- Causes uptake of glucose by the cells
- Decreases blood glucose level
- Promotes glucose storage

**INDICATION:**
1. Elevated blood glucose
2. Diabetic ketoacidosis

**CONTRAINDICATION:**
- Avoid overcompensation of blood glucose level
    - Ongoing monitoring needed to ensure controlled decrease in blood glucose level.

**COMPLICATIONS/ADVERSE REACTIONS:**
1. Hypoglycemia (can include S/S of tachycardia, diaphoresis, mental status changes, seizures)
2. Allergic Reaction

**PRECAUTIONS:**
1. Administration of excessive dose may induce hypoglycemia
2. Glucose should always be readily available. D10 infusion should be readily available to be started.
3. Typically Insulin is injected subcutaneously and is slower acting and longer lasting. An Insulin infusion is faster acting, but still has the ability to cause hypoglycemia after the infusion has been stopped (IV Insulin ½ life is about 15 minutes).

**SIDE EFFECTS:**
1. Few in emergency situations

**EQUIPMENT:**
- Infusion Pump

**HOW SUPPLIED:**
- 100 units/ 100 mL

# Insulin

**DOSE:**

- Initial dose of regular insulin IV may be given at the transferring facility.
- 0.1units/kg/hr maximum rate of infusion. Typical dose 3-8 units/hour.

**STANDING ORDERS:**

1. *Routine ALS Care.*
2. Blood sugar must be checked at time of transfer and every 30 minutes during transport. Contact **Medical Control** if blood sugar <250.
3. Verify infusion rate as well as total time at the transferring facility prior to departure.
    a. Enough medication to last 1.5 times the length of transfer should be available.
    b. If concerns about enough medication a new infusion should be started prior to departure from the transferring facility to ensure adequate supply for the transport, handoff and any additional delays.
4. Monitor patient closely enroute for signs of hypoglycemia.
    a. If altered level of consciousness or other reason to suspect hypoglycemia, immediately check blood glucose level.
    b. If level less than 100
        i. Stop Insulin infusion. Note amount infused and time of suspension.
        ii. Begin D10 infusion until LOC increases to norm, or 250 cc administered.
        iii. Continue to monitor blood glucose every 10 minutes for remainder or transport.
5. The only change in rate/dose of Insulin during inter-facility transfer would be to suspend or discontinue the Insulin. Either action requires **Medical Control** notification after ensuring patient care**.**
6. If perceived life threatening reaction, infusion may be stopped while contacting Medical Control

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

A medical command physician must be contacted prior to the EMS crew taking transfer of care of the patient if any of the following conditions apply:

1. Patient is hypotensive at the time of transfer.
2. An acute deterioration or change in the patient's status is noted.
3. Medications ordered are outside of the concentrations or infusion rates that are permitted by the current prehospital treatment protocols.
4. The prehospital provider has any concern that the provider's experience or abilities, or the available equipment, may not meet the patient's anticipated needs during the transport.

# BPAP

**INDICATION:**

1. Congestive heart failure (CHF), asthma, chronic obstructive pulmonary disease (COPD), pulmonary edema, pneumonia
2. Patient transfer must be from licensed facility to licensed facility
3. Transfer alternative for patient on Opti-Flow not needing intubation based on clinical stability
4. Bi-Level ventilation in place 15 minutes prior to EMS assuming patient care with maximum oxygen setting of 70% and maximum IPAP/EPAP settings of 13/8
    a. Any expected patient needs greater than 13/8 exceed the scope of this protocol and would require hospital staff to accompany or critical care transport.

**CONTRAINDICATION:**

- Patients in severe respiratory failure without spontaneous respiratory drive
- Patient unable to protect their own airway
    - Altered level of consciousness or unresponsiveness
    - Unable to clear secretions/patient is vomiting
    - Unable to maintain anatomical airway patency (weakness, CVA, etc)
- Patient does not tolerate BPAP equipment/mask
- Recent esophageal/facial surgery
- Head/facial trauma or burns

**PROCEDURE:**

1. Check Label size on face mask/harness and select the appropriate size.
2. Place ETCO2 cannula on patient and attach it to cardiac monitor. (if applicable)
3. Set the regulator on the oxygen tank to 8 liters/minute which should deliver approximately 5 centimeters of water, or a CPAP of 5.
4. Connect the oxygen tubing to the Flow Safe II+ device.
5. Place Flow Safe II+ device into the mask.
6. Place mask onto patient and adjust the mask to fit.
7. Check mask for proper seal by viewing the manometer, listening for air escaping, or feeling for air movement at the seal of the mask.
8. Ensure the manometer does not read 0 when the patient inhales (Over-breathing). If the manometer reads 0 when the patient inhales, increase the flow of oxygen until it reads above 0.
9. Increase the CPAP to 10 centimeters of water, or 10 on the manometer by increasing the flow of oxygen.
10. Adjust the switch on the end of the Flow Safe II+ from CPAP to Bi-Level.

# BPAP

11. The IPAP is set to 10, as accomplished in step 9 and can be adjusted if needed.
12. EPAP is set at 5 as its factory setting.
13. To adjust EPAP, adjust the dial on the Flow Safe II+ labelled EPAP to desired setting, consistent with what the transferring facility set on their device (within 13 IPAP/8 EPAP).

**EQUIPMENT:**

- Mercury Medical Flow-Safe II+ Mask
- Sufficient oxygen supply for the entirety of transport

**ADDITIONAL REQUIREMENTS:**

This is an Advanced Scope of Practice Protocol. Only providers who have completed additional system training are authorized to perform. The protocol is only designed for patients who are being transferred from one medical facility to another.

- Patients with a high risk for aspiration can be more susceptible to aspiration with Bi-Level ventilation and should be closely monitored.
- Patients with known/suspected/susceptibility to pneumothorax or pneumomediastinum should be closely monitored.
- Mercury Medical estimates that the Flow Safe II+ will deliver between 70%-75% FiO2, depending on the patient.
- Monitor patient for over-breathing the Flow Safe II+
    - Over-breathing – when the patient is demanding more volume from the system than it can supply at its current setting. This needs to be fixed quickly (by increasing the oxygen supply at the regulator), as it can increase work of breathing and anxiety in the patient as well as affecting the oxygen percentage the(FiO2) the patient is receiving. The anti-asphyxia technology on the Flow Safe II+ will prevent the patient from asphyxiating.

**Pearls**

- **Bi-Level ventilation is referred to as BPAP instead of BiPAP by MEMS because BiPAP is a registered trademark for the Respironics BiLevel device.**