Memorial EMS
Decatur Memorial EMS
Springfield Memorial EMS

Expanded Scope Protocol

For

Interfacility Transfer

Effective April 2024

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Interfacility Transport

Interfacility, Expanded Scope and Critical Care Transport

Interfacility transport via EMS is vital to patient care and definitive treatment. In a rural and suburban setting, the ability to safely and appropriately transfer patients between facilities is essential. This document is designed to outline the most common interventions needed by patients requiring interfacility transport. It is impossible to list, educate to and credential for every possible intervention. The goal of this protocol is to address the vast majority of needs. Patient interventions, not included in this protocol are not allowed unless 1- elevated to the level of, and included in a licensed Critical Care Transport service, 2- the specific situation is presented to member of the EMS System Leadership team and approved for transport with specific guidance for that case, or 3- the transport is approved by a Medical Control Physician not directly involved in the current care of the patient. If approval is obtained for an intervention outside of this protocol, the treating provider should include in the patient care report who was contacted and approved the request.

The vast majority of this protocol is applicable to an Agency participating in Expanded Scope Transport. The Administrative Code outlining this capability includes specific requirements for paramedics/ PHRNs. This is outlined in 515.860. To meet the competency requirements of this program, all providers are required to maintain at all times ACLS, PEPP or PALS, ITLS or PHTLS. Every year in April the EMS Systems will establish times for all providers to validate competency on these protocols through a written test and/or scenario assessment. Providers who do not yet met the one year experience requirement, but who work for an agency who provides Expanded Scope interfacility transports can participate in this competency in April while waiting for their one year of experience benchmark.

Additional information has been provided in this protocol regarding a higher of lower level of care. This is provided as a reference for all who participate in interfacility transport.

Ongoing Interventions

As patients are moved between facilities and/ or discharged to non-hospital facilities to continue their care and recovery, often times interventions will be continuing in the secondary location and therefore during the transport to those locations. The following should serve as guidance for how the most common situations can be cared for and the level of EMS who can participate in those patient transports.

The chart below represents the lowest level of care who can transport a patient with the particular intervention. At any time, a higher level of care unit can be utilized.

	BLS	AEMT	ALS	Expanded Scope	Critical Care
IV Access/ IV fluids	X IV Lock	X IV with fluids infusing			
Patient Controlled Anesthesia	X In use greater than 8 hours prior				
Indwelling Urinary Catheter	X				
Nasogastric or Orogastric Tube			X		
Continuous Nebulizer					X
Continuous Bladder Irrigation			X		
Ventilator- patient ongoing ventilator dependent. Requires trained family member in the patient compartment during patient care and BVM always available.	X				
Ventilator				X see limitations	X
Bilevel Positive Airway Pressure				X see limitations	
Thoracostomy Management				X see limitations	X

Medication Infusions

Medication Infusion Guidelines

The medications listed in the following protocols are the only medications that EMS may transport at the Expanded Scope level. This includes any medication in the ALS Protocol as well as additional, commonly transferred medications. Specific guidelines for each medication are listed in that protocol. General information is listed below. At any time if a crew member does not feel comfortable with the patient condition and the transport scenario they need to relay their concerns to the hand off care providers, work to address the concerns, if not addressed, Medical Control may be contacted.

GENERAL PATIENT CARE ORDERS:

1. All medications, with the exception of Antibiotics, must be transported on a pump. The treating provider must be competent in the management of the pump, either via previous training, or just in time training prior to taking responsibility for patient care.
2. *Routine ALS Care*
3. **Verify initial dose and infusion rate as well as total time at the transferring facility prior to departure.**
4. **Monitor patient closely** en route.
5. Any other change in rate/dosage of the medication during interfacility transfer requires **Medical Control** order.
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 Control 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.

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

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:

7. Any other change in rate/dosage of Heparin during interfacility transfer requires **Medical Control** order.

Nitroglycerin

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 *erectile* dysfunction medications (Sildenafil-Viagra, Tadalafil-Cialis, Vardenadil-Levitra, or Avanafil-Stendra) 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

Nitroglycerin

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. 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).
2. Titrate NTG drip to effect (patient's pain relief) by increasing in 10mcg increments every 3-5 minutes until a response is noted.
3. **BE ALERT FOR DEVELOPING HYPOTENSION**. Titrate down in 10mcg increments for hypotension. Monitor vital signs every 3-5 minutes after an increase in dose.
4. **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)
5. **Maximum infusion of NTG not to exceed 50mcg/minute**

Amiodarone

CLASS:

- Class III antiarrhythmic

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 2nd and 3rd 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

PRECAUTIONS:

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

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. Verify Potassium, Magnesium and liver function labs, if available.
2. Notify Medical Control if heart rate less than 60 or B/P less than 90.

Diltiazem

CLASS:
- Calcium Channel Blocker

ADDITIONAL NAMES:
- Cardizem

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. Paresthesia
3. Headache
4. Weakness
5. Visual disturbance

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

Diltiazem

SIDE EFFECTS:

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

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)

Nicardipine

CLASS:

- Calcium Channel Blocker

ADDITIONAL NAMES:

- Cardene

ACTION:

- Inhibits calcium ion from entering the "slow channels" or select voltage-sensitive areas of vascular smooth muscle and myocardium during depolarization, producing a relaxation of coronary vascular smooth muscle and coronary vasodilation; increases myocardial oxygen delivery in patients with vasospastic angina

INDICATION:

1. Aortic dissection
2. Acute ischemic stroke (BP management with reperfusion therapy)
3. Angina
4. Hypertension
5. Hypertensive emergency
6. Intracerebral hemorrhage
7. Subarachnoid hemorrhage

CONTRAINDICATION:

- Advanced aortic stenosis
- Drug hypersensitivity/allergy

COMPLICATIONS/ADVERSE REACTIONS:

Cardiovascular:

1. Flushing
2. Pedal edema
3. Exacerbation of angina pectoris
4. Hypotension
5. Palpitations
6. Tachycardia
7. Chest pain
8. Extrasystoles
9. Hemopericardium
10. Hypertension
11. Supraventricular tachycardia
12. Edema

Nicardipine

COMPLICATIONS/ADVERSE REACTIONS (cont'd):

Central nervous system

1. Headache
2. Dizziness
3. Hypoesthesia
4. Intracranial hemorrhage
5. Pain
6. Somnolence

Dermatologic:

1. Diaphoresis
2. Skin rash

Endocrine & metabolic:

1. Hypokalemia

Gastrointestinal:

2. Nausea and vomiting
3. Nausea
4. Dyspepsia
5. Abdominal pain
6. Xerostomia

Genitourinary:

1. Hematuria

Local:

1. Injection site reaction
2. Pain at injection site

Neuromuscular & skeletal:

1. Weakness
2. Myalgia
3. Paresthesia

SIDE EFFECTS:

1. Angina/MI
2. Hypotension
3. Syncope
4. Peripheral edema
5. Tachycardia

Nicardipine

HOW SUPPLIED:

- Solution, Intravenous [preservative free]:
  - 20 mg/200 mL in NaCl 0.9% (200 mL)
  - 40 mg/200 mL in NaCl 0.9% (200 mL)
- Solution, Intravenous, as hydrochloride:
  - Cardene IV:
    - 20 mg (200 mL)
    - 40 mg (200 mL)
  - Generic:
    - 2.5 mg/mL (10 mL)
- Solution, Intravenous, as hydrochloride [preservative free]:
  - 2.5 mg/mL (10 mL)

DOSE:

Initial infusion rate: 5mg/hr; Titrate by 2.5mg/hr every 5 minutes; Max infusion rate = 15mg/hr

Labetalol

CLASS:

- Beta blocker

ACTION:

- Blocks beta-1 and beta-2 adrenergic receptors as well as alpha-1 blockade (to a lesser extent)

INDICATION:

1. Hypertension

CONTRAINDICATION:

- Severe bradycardia
- Heart block greater than first degree (except in patients with a functioning artificial pacemaker)
- Cardiogenic shock
- Bronchial asthma or a history of obstructive airway disease
- Uncompensated cardiac failure
- Conditions associated with severe and prolonged hypotension
- Sick sinus syndrome (except in patients with a functioning artificial pacemaker)
- State of hypoperfusion
- Severe peripheral arterial circulatory disorders

COMPLICATIONS/ADVERSE REACTIONS:

1. Bradyarrhythmia
2. Bronchospasm
3. CNS effects
4. Potentiation/masking of hypoglycemia
5. Withdrawal
6. Hypotension

PRECAUTIONS:

1. Treatment of anaphylaxis (e.g. with epinephrine) in patients taking beta-blockers may be ineffective or less effective
2. Older adults are more prone to bradycardic response and lower dosages may be considered
3. Heart failure (HF): Use with extreme caution in patients with compensated heart failure and monitor for a worsening of the condition
4. Hepatic impairment: Use with caution in patients with hepatic impairment; bioavailability is increased due to decreased first-pass metabolism
5. Myasthenia gravis: Use beta blockers with caution in patients with myasthenia gravis
6. Peripheral vascular disease (PVD) and Raynaud disease: Beta blockers may precipitate or aggravate symptoms of arterial insufficiency in patients with PVD and Raynaud disease
7. Pheochromocytoma: Labetalol may be effective in lowering blood pressure and relieving symptoms in patients with pheochromocytoma; however, patients may experience paradoxical hypertensive responses due to inadequate alpha-1 blockade
8. Thyroid disease: Beta blockers may mask signs of hyperthyroidism (e.g. tachycardia)

Labetalol

SIDE EFFECTS:

Cardiovascular:

1. Orthostatic hypotension
2. Edema
3. Flushing
4. Hypotension
5. Ventricular arrhythmia

Dermatologic:

1. Diaphoresis
2. Pruritus
3. Skin rash

Gastrointestinal:

1. Nausea
2. Dysgeusia
3. Dyspepsia
4. Vomiting

Nervous system:

1. Dizziness
2. Drowsiness
3. Fatigue
4. Headache
5. Paresthesia
6. Vertigo
7. Yawning

Ophthalmic:

1. Visual disturbance

Respiratory:

1. Dyspnea
2. Nasal congestion
3. Wheezing

HOW SUPPLIED:

- 5 mg/mL (4 mL, 20 mL, 40 mL)
- 100 mg/100 mL (1 mg/mL) with NaCl 0.72% (100 mL)
- 200 mg/200 mL (1 mg/mL) with NaCl 0.72% (200 mL)
- 200 mg/200 mL (1 mg/mL) with dextrose 5% (200 mL)
- 300 mg/300 mL (1 mg/mL) in NaCl 0.72% (300 mL)

Solution Prefilled Syringe, Intravenous [preservative free]:

- 10 mg/2 mL (2 mL)

Labetalol

DOSE:

Intermittent IV: Initial: 10 to 20 mg over 2 minutes followed by increasing dosages from 20 to 80 mg every 10 minutes until target heart rate and BP are reached; may transition to continuous infusion if unable to obtain target goals. Caution in older adults who may be more prone to bradycardic response (consider lower dosages). Contact Medical Control if exceeding cumulative IV dose of 300mg

Continuous IV infusion: Initial loading dose: 20 mg over 2 minutes (optional if intermittent dosing is used), followed by 0.5 to 2 mg/minute; some patients may require titration up to 10 mg/minute for optimal response

Magnesium Sulfate

ACTION:

- Parenterally, magnesium decreases acetylcholine in motor nerve terminals and acts on myocardium by slowing rate of S-A node impulse formation and prolonging conduction time. Magnesium is necessary for the movement of calcium, sodium, and potassium in and out of cells, as well as stabilizing excitable membranes. Intravenous magnesium may improve pulmonary function in patients with asthma; causes relaxation of bronchial smooth muscle independent of serum magnesium concentration.

INDICATION:

1. Asthma/COPD, severe acute exacerbations
2. Eclampsia/preeclampsia with severe features
3. Hypomagnesemia
4. Torsades de pointes

CONTRAINDICATION:

- Heart block
- Myocardial damage

COMPLICATIONS/ADVERSE REACTIONS:

Cardiovascular:

1. Flushing
2. Hypotension
3. Vasodilation

Endocrine and metabolic:

1. Hypermagnesemia - Magnesium toxicity can lead to fatal cardiovascular arrest and/or respiratory paralysis

PRECAUTIONS:

1. Use with extreme caution in patients with history myasthenia gravis or other neuromuscular disease
2. Caution in patients with renal impairment (risk of build-up causing Magnesium toxicity)

HOW SUPPLIED:

- Solution, Injection:
  - Generic: 50% (10 mL, 20 mL)
- Solution, Injection [preservative free]:
  - Generic: 50% (2 mL, 10 mL, 20 mL, 50 mL)
- Solution, Intravenous:
  - Generic: 4 g/100 mL (100 mL); 1 g/100 mL (100 mL); 2 g/50 mL (50 mL); 20 g/500 mL (500 mL); 4 g/50 mL (50 mL); 40 g/1000 mL (1000 mL)
- Solution, Intravenous [preservative free]:
  - Generic: 4 g/100 mL (100 mL); 1 g/100 mL (100 mL); 2 g/50 mL (50 mL); 20 g/500 mL (500 mL); 4 g/50 mL (50 mL); 40 g/1000 mL (1000 mL)

Magnesium Sulfate

DOSE:

Asthma/COPD severe acute exacerbation:

- IV: 2 g as a single dose over 20 minutes

Eclampsia/preeclampsia with severe features:

- IV: Initial: 4 to 6 g loading dose over 15 to 30 minutes at onset of labor or induction/cesarean delivery, followed by 1 to 2 g/hour continuous infusion for at least 24 hours after delivery; maximum infusion rate: 3 g/hour.
    - If seizure occurs while receiving magnesium, an additional bolus of 2 to 4 g may be administered over ≥5 minutes with frequent monitoring for toxicity

Hypomagnesemia:

- IV: slowly administer at rate ≤1 g/hour

Torsades des pointes:

- ***Polymorphic ventricular tachycardia (with pulse) associated with QT prolongation (torsades de pointes):***
    - **IV:** 1 to 2 g (diluted in 50 to 100 mL D5W) over 15 minutes (range: 5 to 60 minutes)
    - If no response or torsades de pointes recurs, may repeat dose up to a total of 4 g in 1 hour
- ***Ventricular fibrillation/pulseless ventricular tachycardia associated with torsades de pointes:*** **Note:** Administer in conjunction with electrical cardioversion/defibrillation**.**
    - **IV/intraosseous:** 1 to 2 g (diluted in 10 mL D5W) administered as a bolus over ≥1 to 2 minutes; if ineffective, may repeat immediately; maximum total dose: 6 g

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

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.**

STANDING ORDERS:

1. Verify lab values (serum electrolytes, BUN & creatinine) prior to departure (if available).
2. Incompatible with Phenergan (promethazine), Sodium Bicarbonate, Sodium Nitroprusside and Atropine.
3. 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.
4. **Monitor patient closely** en route. If signs & symptoms of hyperkalemia occur, stop the infusion and **contact Medical Control.**
5. **Monitor urinary output** (long-distance transports) and **contact Medical Control** if urinary output is < 30mL/hr for two (2) consecutive hours.

Dopamine

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)

HOW SUPPLIED:
- 400mg in 250mL D_5W
- 800mg in 250 mL D_5W

Dopamine

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. Verify patient's **weight (in *kilograms*)**
2. Verify concentration & dose, infusion rate as well as total time and vital sign parameters at the transferring facility prior to departure.
3. 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.***
4. Monitor urine output (should be at least 25mL/hr)
5. **Maximum infusion of Dopamine not to exceed 50mcg/kg/minute.**

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

HOW SUPPLIED:
- 250 mg/ 250 mL

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

Norepinephrine

CLASS:
- Sympathomimetic

ADDITIONAL NAMES:
- Levophed

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.
4. Infusion rates > 20 mg/ min significantly increase risk of extravasation.

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

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

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.

Norepinephrine

STANDING ORDERS:

1. 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.
2. Any change in rate/dosage of Norepinephrine 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.

Alteplase (post Tenecteplase IVP)

CLASS:

- Thrombolytic

ADDITIONAL NAMES:

- Activase (Alteplase)
- Alteplase (Alteplase)
- TNKase (Tenectaplase)

ACTION:

- Dissolve clot in treatment of ischemic stroke.

INDICATION:

1. Ischemic Stroke-Alteplase and Tenecteplase.
2. Acute MI-Alteplase and Tenecteplase.
3. Unstable Pulmonary Embolism-Alteplase

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

Alteplase (post Tenecteplase IVP)

PRECAUTIONS:

1. Alteplase or Tenecteplase 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.

SIDE EFFECTS:

1. Bleeding at venipuncture sites and other various sites
2. Hematuria
3. Intercranial hemorrhage

HOW SUPPLIED:

- Alteplase -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:

- If infusion is completed during transport, tPA should be discontinued and line kept open by infusing 0.9% Normal Saline at TKO rate.

PEARLS

While Tenecteplase (TNK) is used in the same patients, the administration of a single injection negates the need for EMS to transport with an ongoing infusion. Regardless the side effects, precautions, and standing orders above would also apply to the patient post Tenecteplase as they would for a patient post Alteplase.

Antibiotics

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 (aminoglycosides)

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. Dial a flow devices can also be utilized.

HOW SUPPLIED:

- Varies by antibiotic

DOSE:

- Dependent on the specific antibiotic.

Antibiotics

STANDING ORDERS:

1. Antibiotics need to be started 15 minutes or more before the start of the transport.
2. **Verify infusion rate as well as total time at the transferring facility prior to departure.**
3. Follow A*naphylaxis Protocol* if needed for signs of allergic reaction and/ or shock.
4. If infusion is completed during transport, antibiotics should be discontinued, and line kept open by infusing 0.9% Normal Saline at TKO rate.

Pantoprazole

CLASS:
- Proton Pump Inhibitor

ADDITIONAL NAMES:
- Protonix

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

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.

Blood Products

CLASS:
- Blood Components

ADDITIONAL NAMES:
- FFP
- PRBCs
- Platelets
- Clotting factors

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

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. Temperature must be taken every 15 minutes.
3. If perceived life-threatening reaction, infusion may be stopped while contacting Medical Control.
4. Tubing must be changed every 2 units or after every 4 hours of use. Tubing must be discarded immediately following completion of transfusion.
5. If receiving two separate blood products (RBC's and platelets), they must infuse through separate IV sites.
6. **If signs of transfusion reaction, infusion should be stopped, and the 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. **Hypertension/ Hypotension**
        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**

Octreotide

CLASS:
- Synthetic hormone
- Antidiarrheal Somatostatin Analog

Additional Names
Sandostatin

ACTION(S):
Long Acting octapeptide 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

HOW SUPPLIED:

- 500 mcg/100 mL

DOSE:

- 25-100 mcg/hr

STANDING ORDERS:

1. Verify lab values (platelet count, coagulation studies) prior to departure (if available).
2. If uncontrolled bleeding or allergic reaction develops, immediately discontinue the infusion, provide necessary treatment and **contact Medical Control**.

Naloxone

CLASS:
- Narcotic Antagonist

ADDITIONAL NAMES:
- Narcan

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 opioid use.

PRECAUTIONS:
1. Be alert for patient reaction to medication.

SIDE EFFECTS:
1. Allergic reaction
2. Anaphylaxis

HOW SUPPLIED:
- 2mg/500mL
- 4mg/250mL

DOSE:
- Typical infusion is 50-67% of dose that was needed to reverse patient. Typically 1-6 mg/ hour.

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

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

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)

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

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

HOW SUPPLIED:
- 100 units/ 100 mL

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.

Insulin

STANDING ORDERS:

1. Blood sugar must be checked at time of transfer and every 30 minutes during transport. Contact **Medical Control** if blood sugar <250.
2. 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.
3. 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 if altered LOC and blood glucose is < 70 mg/dl.
        iii. Continue to monitor blood glucose every 10 minutes for remainder or transport.

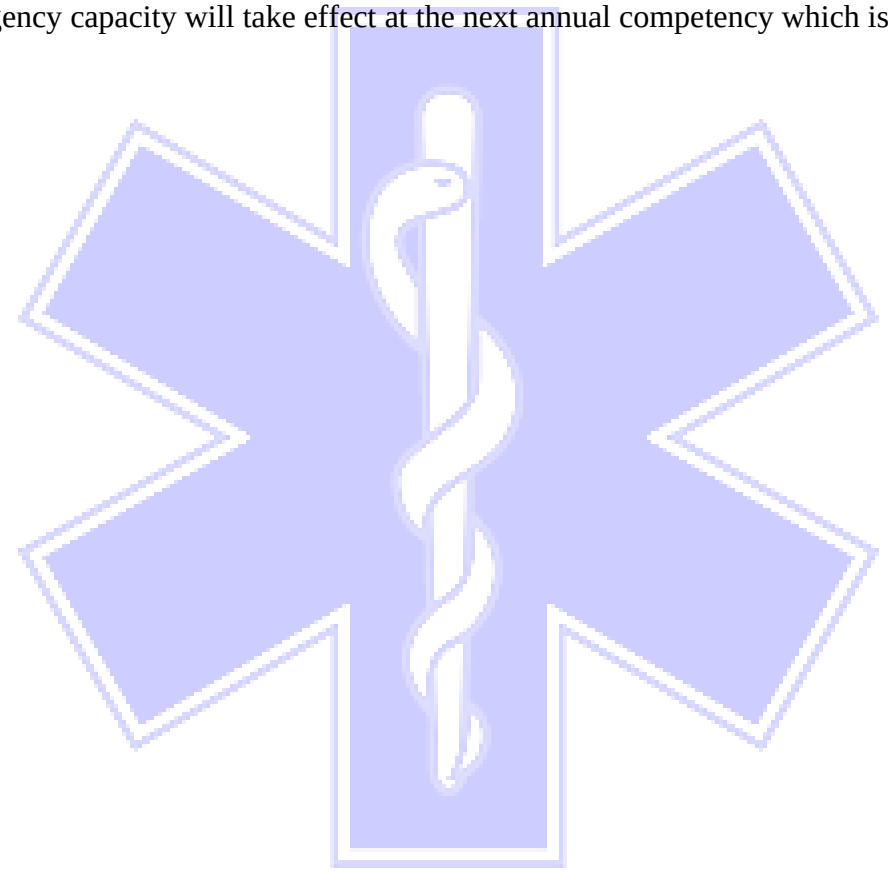
Device Assisted Interventions

Device Assisted Allowed Interventions

The protocols included in Device Assisted Interventions are based on Agency capability. Based on agency training and equipment an agency can opt in for any of the following protocols. Any time a patient is transported and needs support from external equipment, such as Oxygen, the transporting crew needs to validate the usage rate and calculate that they have enough for 150% of the estimated oxygen consumption available before initiating the transport.

- BPAP
- Ventilator Transport
- Thoracostomy

Changes in EMS Agency capacity will take effect at the next annual competency which is held in April of each year.



BPAP with Flow-Safe II+ Mask

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. Apply inline capnography via nasal canula to be utilized under face mask.
5. Connect the oxygen tubing to the Flow Safe II+ device.
6. Place Flow Safe II+ device into the mask.
7. Place mask onto patient and adjust the mask to fit.
8. Check mask for proper seal by viewing the manometer, listening for air escaping, or feeling for air movement at the seal of the mask.
9. 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.
10. Increase the CPAP to 10 centimeters of water, or 10 on the manometer by increasing the flow of oxygen.
11. Adjust the switch on the end of the Flow Safe II+ from CPAP to Bi-Level.
12. The IPAP is set to 10, as accomplished in step 9 and can be adjusted if needed.
13. EPAP is set at 5 as its factory setting.
14. 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).

BPAP with Flow-Safe II+ Mask

EQUIPMENT:

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

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.**

BPAP using Ventilator or dedicated BPAP Device

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 80% and maximum IPAP/EPAP settings of 18/10
    a. **Any expected patient needs greater than 18/10 exceeds the scope of this protocol and would require hospital staff to accompany (i.e. respiratory therapy) 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 for appropriate sized face mask/harness.
2. Set the Ventilator to Bi-Level support with current IPAP and EPAP settings
3. Connect the oxygen source to the Ventilator.
4. Apply inline capnography via nasal canula to be utilized under face mask.
5. Attach face mask/harness to Ventilator
6. Place mask onto patient and adjust the mask to fit.
7. Check mask for proper seal by viewing the IPAP and EPAP pressures, listening for air escaping, or feeling for air movement at the seal of the mask.
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. Ensure patient is tolerating transport Ventilator for at least 5 minutes prior to leaving
10. If any problems arise p contact Medical Control
11. Ventilatory flow sheets must be completed and attached to ePCR.

BPAP using Ventilator or dedicated BPAP Device

EQUIPMENT:

- SMH/DMH EMS approved ventilator or dedicated BPAP device.
- Sufficient oxygen supply for the entirety of transport including transport from ambulance to bed at receiving hospital.

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.**

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. Work with respiratory therapy at transferring hospital to set up transport ventilatory settings
4. Set mode (i.e. AC, PC, SIMV, PS). If mode is not available on your ventilator or unable to match patient settings on your ventilator, contact Medical Control
5. Set breaths per minute (BPM) to maintain desired minute ventilation. Maintain plateau pressure $\leq$ 30 cm H2O.
6. If volume mode or combination set Tidal Volume (Vt): 5-8 mL/Kg ideal body weight.
7. If Pressure mode set pressure support to reach desired tidal volume.
8. 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).
9. 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.
10. Set Tidal Volume (Vt): 8 ml/Kg of ideal body weight (IBW), while maintaining above plateau pressures and delta.
11. 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).
12. Verify ventilator is delivering oxygen adequately (look, listen, and feel) to the device.
13. Attach ventilator tubing to patient.
14. Verify patient ventilatory status:
    a. Rise and fall of chest
    b. Equal breath sounds
    c. Capnography waveform
    d. Pulse oximetry
    e. Updated vital signs
15. Ventilatory flow sheets must be completed and attached to medical record.
16. A Bag valve mask must be maintained with the patient at all times.

Memorial EMS
Decatur Memorial EMS
Springfield Memorial EMS

Ventilator Assisted Transport of Patients

Patient's Name: _____ Date: _____

Diagnosis: _____

Sending Facility: _____

Receiving Facility: _____

Transporting Agency: _____ ePCR#_____

Report Received From:_____

Paramedic:_____ Lic No._____

Ventilator Settings

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

Pressure Support _____ CPAP _____ Bi PAP _____ IPAP/ EPAP_____

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 _____

This tools is provided as a minimum standard for Agencies to utilize when completing their QA as required in the Aministrative Code. QA shall be maintained by the agency for the first year for all new providers (new to agency or to role) as well as new medications and interventions. Reports should be submitted to the EMS System quarterly

Thoracostomy Patient Transport

INDICATIONS:

1. Must be either 8 years of age or older or 45 kg or more.
2. 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*.)

Quality Assurance

Memorial EMS
Decatur Memorial EMS
Springfield Memorial EMS

QA/QI

Agency: _____ Date:_____ ePCR:_____

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 QI Coordinator

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

This tools is provided as a minimum standard for Agencies to utilize when completing their QA as required in the Aministrative Code. QA shall be maintained by the agency for the first year for all new providers (new to agency or to role) as well as new medications and interventions. Reports should be submitted to the EMS System quarterly.