EMS REGION XI CHICAGO

CRITICAL CARE TRANSPORT – PARAMEDIC

STANDING MEDICAL ORDERS (SMO)

EMS Region XI Chicago
Critical Care Transport-Paramedic
Standing Medical Orders (SMOs)

The Chicago EMS System (Region XI) recognizes that the critical care paramedic and his/her assigned base station assume the responsibility for continuation of care and management of the acutely ill/injured and potentially unstable patient during inter-facility transport. The following Critical Care Standing Medical Orders (SMOs) have been developed for the Critical Care paramedic during such transports and have been written in addition to the established Region XI Paramedic Standing Medical Orders. Should a situation or concern arise during the transport, the Critical Care paramedic is to contact his/her assigned medical control base station for further direction.

These SMO's have been developed for use by system approved Critical Care paramedics only. Approved paramedics have successfully completed IDPH approved educational and credentialing requirements above the EMT-P level to care for patients utilizing these SMOs as required by their medical condition.

The following Critical Care SMOs shall be reviewed periodically and revised as standards of practice or clinical practice guidelines change.

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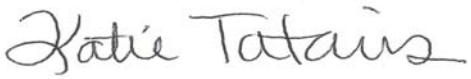

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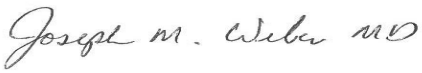

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EMS Region XI Chicago
Critical Care Transport-Paramedic
Standing Medical Orders (SMOs)

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ROUTINE MEDICAL CARE/ROUTINE CRITICAL CARE (RMC/RCC)

For inter-facility transports of critical care patients:

In addition to following Region XI Paramedic SMOs for Routine Medical Care (RMC), the Critical Care EMT Paramedic (CCEMTP) will follow the routine care for critical care patient.

1. Upon arrival at sending facility, obtain updated report on the patient's current condition from the RN and/or MD including: medications, IVs, specialized equipment and the settings of any equipment.

2. Confirm that all appropriate documents including medical records, transfer forms, and transfer orders are obtained.

3. Confirm all transport orders with sending physician (or designee). Obtain all necessary signatures related to the transfer of the patient. Document name and contact number for the physician accepting the transport. Document name of nurse who gave report and name of nurse that received report.

4. Use sending physician's parameters as defined in transport orders. If none available, follow with parameters given in the specific SMO.

5. Obtain copies of all necessary lab work, imaging, and other pertinent medical information relevant to the transport of the patient.

6. Perform a history and complete advanced/critical care physical assessment of the patient and document findings.

7. Confirm patency of all IV lines and document location. Continue all maintenance IV infusions as ordered per transferring physician. Obtain IV access if needed.

8. Place patient on cardiac monitor. Maintain cardiac monitoring of the patient throughout transport until hand off at the receiving facility

9. Confirm settings of all equipment and document.

10. Obtain a complete set of baseline vital signs. Document vital signs per patient condition and in accordance with Region XI Paramedic SMOs. Reassess vital signs every 15 minutes or more frequently as patient condition dictates.

11. Evaluate airway status and place patient on appropriate oxygen for transport. Apply supplemental oxygen as directed by transfer orders or to keep the SpO2 ≥ 94%.

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12. Verify ventilator settings and document. All patients with advanced airway and/or a new tracheostomy must have continuous waveform capnography. Capnography readings must be documented and a copy of the waveform must be attached to the run form. Capnography must continue until the patient is transferred to the hospital bed. After transfer, verify capnography reading with hospital staff and document.

13. Continue all maintenance IV infusions as ordered per the transferring physician and obtain any titration parameters for use during transport.

14. On-going assessment of the patient is to be performed throughout transport and documented on the patient care report.

15. In the event the patient develops medication side effects or the clinical condition worsens, follow the appropriate Region XI ALS SMO and contact medical control as needed for further direction.

16. Any incidents including medication side effects, equipment issues, or patient safety concerns, will be documented and submitted to the company's director of critical care and to the respective Resource Hospital.

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ACETYLCYSTEINE (ACETADOTE, MUCOMYST) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If available, obtain key labs: acetaminophen level, liver enzymes, bilirubin, BUN, creatinine, glucose, coagulation factors, sodium, potassium.
5. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further direction.

II. Dose:

- Maintenance of infusion only
- Typical dosing 50 – 100 mg/kg

III. Actions:

- Reduces the viscosity of pulmonary secretions.
- Hepatoprotective agent that restores liver stores of glutathione to treat acetaminophen toxicity

IV. Indications:

Acetaminophen toxicity, thickened mucous secretions in pneumonia, bronchitis, tuberculosis, cystic fibrosis, emphysema, atelectasis, pulmonary complications of thoracic surgery.

V. Contraindications:

None

VI. Side Effects:

Bronchospasm, anaphylactoid reaction, angioedema, chest tightness, cough, dyspnea, tachycardia, diaphoresis, rhinorrhea

VII. Precautions/Interactions:

- Caution in patients with asthma or bronchospasm
- Caution in elderly or debilitate patients with severe respiratory insufficiency

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AMIODARONE (CORDARONE)

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. IV must have in line filter.
4. If available, obtain pertinent labs: potassium, magnesium, liver function tests, and digoxin levels.
5. Monitor the patient for a symptomatic decrease in systolic BP or symptomatic bradycardia. For symptomatic hypotension discontinue the medication infusion. Consider a 300 ml fluid bolus if the patient's symptoms do not improve and follow Region XI Paramedic SMOs for appropriate treatment.
6. If symptomatic bradycardia develops, discontinue the infusion. If symptoms do not improve, follow the Region XI Bradycardia SMO.
7. If an IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

Infusion Rate: 0.5 - 1.0mg/min

III. Action:

A Class III antiarrhythmic medication that inhibits adrenergic stimulation via both alpha and beta blocking properties that stabilizes the membrane. Amiodarone prolongs the action potential and refractory period resulting in a decrease in AV conduction and sinus node function.

IV. Indication:

Treatment and prophylaxis of tachyarrhythmias.

V. Contraindication:

Cardiogenic shock, torsades de pointes, sinus arrest, bradycardia, second or third degree AV block, hypersensitivity to iodine.

VI. Side Effects:

Bradycardia, arrhythmias, heart failure, heart block, hypotension, acute respiratory distress.

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VII. Precautions/Comments:

- *Antiarrhythmic:* May induce torsade de pointes
- *Beta and calcium channel blockers:* May potentiate bradycardia, sinus arrest. May increase hypotensive effect
- *Digoxin:* May increase digoxin level 70% to 100%
- *Fentanyl:* May cause hypotension, bradycardia and decreased cardiac output

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ANTIBIOTICS

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Obtain and document the patient's current temperature.
4. Verify antibiotic name, dose, and infusion rate.
5. Monitor the patient for signs and symptoms of allergic reaction (see precautions/comments).
6. If signs and symptoms of allergic reaction appear, stop the infusion and refer to Region XI Paramedic SMO(s) for the treatment of allergic reactions and contact medical control for further directions.
7. If antibiotic infusion is completed during transport, initiate 0.9NS at TKO rate or maintain existing IV infusion.
8. If an IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Maintenance of infusion only.
- Antibiotics should be infused over 30 – 60 minutes unless otherwise noted by physician.

III. Action:

Medications designed to destroy or inhibit the growth of harmful pathogens (bacteria, viral, fungal, parasite)

IV. Indication:

- Used in prevention and treatment of infectious disease.
- Several classification schemes, each target specific types of infections:

Penicillins: penicillin (Unasyn, Zosyn)
Cephalosporins: ceftriaxone
Macrolides: clarithromycin (Biaxin), azithromycin (Zithromax)
Tetracyclines: tetracycline (Panmycin), doxycycline (Vibramycin)
Sulfonamides: co-trimoxazole (Bactrim)
Glycopeptide: vancomycin
Fluoroquinolone: levofloxacin, moxifloxacin, ciprofloxacin
Lincosamide: clindamycin

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V. Contraindications:

Known allergy or intolerance

VI. Precautions/Comments:

Allergic reaction signs and symptoms include: rash, hives, nausea, vomiting, diarrhea, abdominal pain, shortness of breath, wheezing, flushed skin, facial swelling, chest tightness, hypotension, tachycardia, and shock.

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BLOOD/BLOOD PRODUCTS ADMINISTRATION (PRBC'S, WHOLE BLOOD, PLATELETS, FFP)

I. Procedure:

1. RMC/RCC.
2. Identify the patient and blood/blood product by checking the patient ID band against the blood/blood product label and blood/blood product order for name, blood type, blood bag number and expiration date.
3. Obtain and document the patient's current temperature.
4. If available, obtain and document pertinent labs: hemoglobin, hematocrit
5. Regulation of the blood/blood product will be administered through filtered IV.
6. In MOST situations, the blood or blood product should have been running for at least 15 minutes before transfer. In rare situations, CCEMTP's may transport the patient without waiting for the standard 15 minutes when the medical condition warrants immediate transfer.
7. Regulation of the infusion rate will occur within the parameters of the transferring physician. **The CCEMTP WILL NOT MAKE ADJUSTMENTS TO FLOW RATE**, other than to discontinue the infusion in the event of complications.
8. Monitor patient for signs and symptoms of transfusion reaction and document side effects.
9. In cases of suspected transfusion reaction, stop the infusion. DO NOT CLEAR THE BLOOD TUBING. Obtain a new IV site with 0.9 NS IV and treat allergic reaction according to Region XI Paramedic SMOs. Save all tubing and blood bag. Contact medical control for further direction.
10. If transfusion is completed during transport, note the time the infusion was completed and initiate 0.9 NS.
11. Should an IV pump failure occur and cannot be corrected, continue the infusion utilizing the roller clamp on the blood tubing.
12. Complete the blood administration form for all blood or blood products.

II. Action:

Replacement of a blood product to correct a specific physiologic derangement such as reduced oxygen carrying capacity secondary to blood loss or a coagulopathy.

III. Indications:

Depends on the product being administered:

- *Whole Blood*: Acute or chronic blood loss
- *Packed Red Blood Cells (RBCs)*: Acute or chronic blood loss
- *Platelets:* Severe thrombocytopenia or reversal of an antiplatelet medication
- *Fresh Frozen Plasma (FFP):* Reversal of a coagulopathy specific to FFP administration

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IV. Contraindications:

Religious beliefs

V. Side Effects:

- Transfusion reactions (increased temperature, chills, headache, chest pain, back pain). Refer to appendix for details and types of transfusion reactions
- Volume overload secondary to rapid infusion.

VI. Precautions/Comments:

NO DRUGS OR INFUSIONS ARE TO BE RUN THROUGH THE BLOOD INFUSION

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DILTIAZEM (CARDIZEM)

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Obtain titration parameters from sending physician.
4. In the absence of sending physician orders, if the patient's heart rate decreases to less than 60 or greater than 150, contact medical control. If the SBP or mean arterial pressure (MAP) drops significantly, initiate a 300 ml NS bolus. If patient condition deteriorates, discontinue the medication, follow most appropriate Region XI SMO and contact medical control.
5. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Maintenance of infusion only
- Usual dosing: 5 -15mg/hr

III. Action:

- Calcium channel blocker that inhibits calcium ion influx across cardiac and smooth muscle cells decreasing myocardial contractility and oxygen demand.
- Dilates coronary arteries and arterioles
- Antihypertensive

IV. Indications:

- Chronic stable angina pectoris
- Atrial fibrillation with rapid ventricular rate
- Tachyarrhythmias

V. Contraindications:

- Second or third degree heart block
- Cardiogenic shock
- Ventricular tachycardia
- Systolic blood pressure less than 90mmHg
- Acute myocardial ischemia or infarction
- Use with caution in patients with heart failure, impaired hepatic or renal function

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VI. Side Effects:

Arrhythmias, AV block, bradycardia, heart failure, hypotension

VII. Precautions/Comments:

- *Diazepam, midazolam:* May increase CNS depression
- *Digoxin*: May increase digoxin levels
- *Lasix*: May form a precipitate when mixed. Administer medication through a separate line
- *Beta blockers:* May prolong conduction time

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DOBUTAMINE INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. If available, obtain and document key labs: potassium.
4. Obtain titration parameters from sending physician.
5. In the absence of sending physician orders:
    a. Titrate the medication infusion rate as needed to maintain a systolic blood pressure (SBP) of 90 -100 mmHg.
    b. If the patient's SBP increases to greater than or equal to 110 mm Hg or tachycardia greater than 150 bpm, decrease the infusion rate until BP or heart rate decreases. If SBP or mean arterial pressure (MAP) drops significantly, initiate a 300 ml NS bolus.
6. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Titrate the medication infusion to parameters set by the sending physician
- Usual concentration 500mg/250 ml
- 2.5 – 20mcg/kg/min to max of 40mcg/kg/min, titrated to desired response

III. Action:

Direct beta1 agonist that increases contractility and heart rate with minimal direct effect on blood pressure.

IV. Indications:

Short term management of patients with cardiac decompensation typically related to heart failure, sepsis, or hypotensive states.

V. Contraindications:

- Idiopathic hypertrophic subaortic stenosis
- Allergy to sulfites

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VI. Side Effects:

- Headache
- Hypertension, increased heart rate, angina, PVC's, palpitations, hypotension, tachycardia

VII. Precautions/Comments:

- *Dobutamine:* Produces a mild reduction in serum potassium
- *Beta blockers*: May antagonize effects

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DOPAMINE INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. If available, obtain and document key labs: sodium, potassium.
4. Obtain titration parameters from sending physician.
5. In the absence of sending physician orders:
    a. Titrate the medication infusion rate as needed to maintain a systolic blood pressure (SBP) of 90 -100 mmHg.
    b. If the patient's SBP increases to greater than or equal to 110 mm Hg or tachycardia greater than 150 bpm, decrease the infusion rate until blood pressure or heart rate decreases. If SBP or mean arterial pressure (MAP) drops significantly, initiate a 300 ml NS bolus.
6. If pump failure occurs and cannot be corrected, discontinue the medication infusion and notify medical control

II. Dose

- Titrate to parameters set by the sending physician.
- Usual dosing between 1-20 mcg/kg/minute
- Maximum dose 50 mcg/kg/minute

Initiation of dopamine infusion: If patient is hypovolemic, administer 300 ml NS bolus and repeat as needed for fluid replacement. Initiate Dopamine infusion 400mg/500ml D5W and infuse to maintain a SBP of 90-100mmHg.

III. Action:

Vasopressor medication that stimulates adrenergic and dopaminergic receptors in a dose related fashion.

- Low dose: 1-5 mcg/kg/minute, increase renal blood flow and urine output
- Intermediate dose: 5-15 mcg/kg/minute, increased heart rate, cardiac contractility and cardiac output
- High dose: >15 mcg/kg/minute, vasoconstriction and increased blood pressure

IV. Indications:

Hemodynamic support for inadequate systemic perfusion or for clinical conditions including: Open heart surgery, renal failure, congestive heart failure

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V. Contraindications:

- Hypersensitivity to sulfites
- Pheochromocytoma
- Administration prior to adequate fluid resuscitation if appropriate

VI. Side Effects:

- Headache
- Hypotension, tachyarrhythmias, tachycardia, angina, palpitations
- Hyperglycemia

VII. Precautions/Comments:

- *Beta blockers:* May antagonize dopamine effects
- Uncorrected tachyarrhythmias
- Hypovolemic shock
- Doses > 20 mcg/kg/minute are unlikely to give additional hemodynamic benefits and increase the risk of tachyarrhythmias

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FENTANYL (SUBLIMAZE) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Obtain concentration, dose, and infusion rate for transport. Maintain infusion rate as specified in transfer orders.
4. Patients being transported on a fentanyl infusion require a secured advanced airway confirmed at the sending hospital.
5. Evaluate patient's baseline level of sedation utilizing the GCS and sedation scale (RASS/MAAS) and document. Refer to appendix for sedation scale details.
6. If patient's pain increases during transport and systolic BP >90mmHg, titrate fentanyl to pain relief.
7. In adults, if blood pressure decreases significantly, administer 300 ml fluid bolus of 0.9NS. In pediatric patients, if blood pressure decreases below 70 + 2x's age in years, administer 20 ml/kg fluid bolus of 0.9NS. Contact medical control in either situation
8. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

Titrate for pain relief while maintaining systolic BP greater than or equal to 90mmHg

- Adult: 0.5-2 mcg/kg/hour
- Pediatric: Patients less than 50 kg – 1-3 mcg/kg/hour titrate to pain relief
- Neonates: 0.5-1 mcg/kg/hour titrate to pain relief

III. Action:

- Opioid analgesic. Acts on opioid receptors causing analgesic action of short duration.
- Synthetic narcotic that has a more potent effect than morphine and meperidine (Demerol)
- Fentanyl 100 mcg has the same effect as 10 mg morphine or 75 mg meperidine (Demerol)

IV. Indications:

- Pain control

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V. Contraindications:

- Hypersensitivity to opioids
- Respiratory compromise
- Renal failure
- Caution with bradycardia
- Caution with volume depleted patients

VI. Side Effects:

Opiate toxicity (CNS depression, respiratory depression, miosis, bradycardia) seizures, chest pain, hypotension, chest wall rigidity.

VII. Precautions/Comments:

Amiodarone: May cause hypotension, bradycardia, decreased cardiac output

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FUROSEMIDE (LASIX) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify dose/ concentration, and infusion rate on the transferring facility's Medical Administration Record (MAR) and the IV pump to confirm dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If available: obtain key lab values: sodium, potassium, BUN, glucose
5. Document urinary output at the beginning and end of transport.
6. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further direction.

II. Dose:

- Maintenance of infusion only
- Standard concentration: 100mg/100ml (1mg/ml)
- Usual infusion rate 10-40 mg/hour. Maximum 160 mg/hour

III. Actions:

- Diuretic
- Antihypertensive

IV. Indications:

- Acute pulmonary edema
- Congestive heart failure
- Fluid overload

V. Contraindications:

Renal insufficiency, Sulfa allergy

VI. Side Effects:

Vertigo, headache, dizziness, paresthesia, thrombophlebitis at IV site, hypokalemia, muscle spasm.

VII. Precautions/Comments:

- *Aminoglycosides*: May cause ototoxicity
- *Corticosteroids:* May increase risk of hypokalemia
- *Antihypertensives*: May increase risk of hypotension
- *Cardiac glycosides*, neuromuscular blockers: May increase toxicity

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HEPARIN

I. Procedure:

1. RMC/RCC.
2. Verify dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. If available, obtain and document key lab values: hemoglobin, hematocrit, coagulation profile (PT, PTT/INR).
4. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Maintenance only.
- Patient may have received a bolus of 80 units/kg followed by an infusion dose which starts at 18 units/kg/hour.
- Weight based dosing with a typical maximum rate of 1000 units per hour.

III. Action:

Anticoagulant medication that inhibits the clotting cascade.

IV. Indications:

- Used with the administration of TPA in the acute myocardial infarction patient
- Acute coronary syndromes, (example: NSTEMI)
- Treatment for pulmonary embolism
- Treatment for new onset atrial fibrillation without embolization
- Treatment of deep vein thrombosis
- ECMO circuit for extracorporeal life support

V. Contraindications:

- Severe thrombocytopenia
- Uncontrolled bleeding
- Recent surgery

VI. Side Effects:

Bleeding

VII. Precautions/Comments:

Monitor for bleeding and contact medical control for direction

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HYPERALIMENTATION – TOTAL PARENTERAL NUTRITION (TPN) AND LIPIDS

I. Procedure:

1. RMC/RCC.
2. Verify solution formula and rate of infusion for transport from the transferring facility's Medication Administration Record (MAR) and IV pump to confirm patient's dose.
3. Hyperalimentation products should only be administered through a central line.
4. If available, obtain and document all pertinent labs: glucose, sodium, potassium. If the glucose value is more than 1 hour old than obtain new blood glucose.
5. Filtered tubing must remain in place
6. If central line becomes dislodged, or if the site is leaking, first control any bleeding and then clamp-off the port. Contact medical control for further direction.
7. If pump failure occurs and cannot be corrected, discontinue the infusion and monitor blood glucose levels every 15 minutes. If glucose level is <60 mg/dL treat according to Region XI SMOs and contact medical control for further direction.
8. If the patient becomes hemodynamically unstable or cardiac arrest occurs, discontinue the TPN/Lipid infusion, flush the IV and utilize the central line to administer resuscitative drugs and/or IV fluids per Region XI SMOs.

II. Dose:

Maintenance of infusion only.

III. Action:

- Provides nutrition for patients who are unable to tolerate oral or enteral feedings
- An IV preparation that includes glucose, amino acids, electrolytes, vitamins and fat emulsions

IV. Indications:

Health conditions that prevent the absorption of nutrients.

V. Contraindications:

None significant

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VI. Side effects:

Hyperglycemia
Electrolyte disturbance
Allergic reactions

VII. Precautions/Comments:

IV lines used for TPN or lipids should be considered incompatible with all other drugs

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INSULIN

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration, and rate of the infusion from the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. If available, obtain and document key labs: blood glucose level, potassium, magnesium, creatinine.
4. Obtain blood glucose level prior to transport. Monitor and document patient's blood sugar every 30 minutes throughout transport.
5. Monitor for altered level of consciousness and if this develops, check blood sugar. If blood sugar drops below 60mg/dL follow Region XI paramedic SMOs.
6. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

Adults: Usual dose 0.1 units/kg/hr
Pediatrics: 0.1 unit/kg/hr

III. Action:

Naturally occurring hormone that stimulates the uptake of glucose by the cells, decreases blood glucose and promotes glucose storage.

IV. Indications:

- Uncontrolled hyperglycemia
- Severe diabetic ketoacidosis
- Certain overdoses as specified by Illinois Poison Center recommendations

V. Contraindications:

Hypoglycemia

VI. Side Effects:

- Hypoglycemia
- Hypomagnesemia
- Hypokalemia
- Shortness of breath and reduced pulmonary function

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VII. Precautions/Comments:

- *ACE inhibitors, calcium, MAO inhibitors, salicylates*: May enhance hypoglycemic events
- *Albuterol, diltiazem, diuretics, dobutamine, epinephrine, MSO4, Dilantin*: May diminish the effectiveness of insulin response
- *Beta Blockers*: May mask symptoms of hypoglycemia

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LABETALOL (TRANDATE) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration, and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. Titrate the medication infusion rate 0.5mg/min every 10 minutes as needed to maintain the systolic blood pressure as directed by the sending physician
5. If systolic blood pressure decreases below the parameters directed by the sending physician decrease the infusion rate until the blood pressure returns to the prescribed parameters. Administer a 300 ml NS bolus as needed.
6. If available, obtain key labs: glucose
7. If pump failure occurs that cannot be corrected, discontinue the medication infusion and contact medical control for further direction.

II. Dose:

- Usual dose: 2mg/min IV infusion
- Maximum dose 2mg/min. Maximum 300 mg cumulative total dose.

III. Action:

Reduces peripheral vascular resistance as a result of alpha and beta blockade

IV. Indications:

Hypertension, severe hypertensive emergencies

V. Contraindications:

Bronchial asthma, cardiac failure, cardiogenic shock, severe bradycardia

VI. Side Effects:

Ventricular arrhythmias, bronchospasm, dizziness, orthostatic hypotension

VII. Precautions/Interactions:

- *Beta agonists*: May blunt bronchodilator effect
- *Cimetidine*: May enhance effect of labetalol
- *Diuretics*: May cause hypotensive effects
- *Nitroglycerin*: May blunt reflex tachycardia
- Drug interactions with: furosemide, heparin, sodium bicarbonate, warfarin

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LIDOCAINE INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify dose / concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. If available, obtain and document key labs: phenytoin levels.
4. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Maintenance of infusion only
- Usual dose: 1 – 4 mg/minute

III. Action:

Class I antiarrhythmic that decreases the automaticity of the conduction system

IV. Indications:

Ventricular ectopy or arrhythmia suppression

V. Contraindications:

SA, AV or interventricular block in the absence of a pacemaker

VI. Side Effects:

Confusion, tremors, light-headedness, seizures, hallucinations, hypotension, bradycardia, new arrhythmias, cardiac arrest, respiratory depression and arrest

VII. Precautions/Comments:

Beta blockers: May increase risk of toxicity of lidocaine
Cimetidine: May decrease clearance of lidocaine increasing risk of toxicity
Phenytoin, Procainamide, Propranolol: May increase cardiac depressant effects
Succinylcholine: May prolong neuromuscular blockade

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LORAZEPAM (ATIVAN) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Obtain concentration, dose, and infusion rate for transport. Maintain infusion rate as specified in transfer orders.
4. If available, obtain and document key lab values: liver enzymes, BUN, creatinine, sodium, potassium, and digoxin.
5. Patients being transported on a lorazepam infusion require a secured advanced airway confirmed at the transferring facility.
6. Evaluate the patient's baseline level of sedation utilizing the GCS (Glasgow Coma Scale) and sedation scale (RASS or MAAS) and document. Refer to appendix for sedation scale details.
7. If an IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Usual dosing 0.01 – 0.1 mg/kg/hr.
- Maximum dose≤ 10 mg/hr.

III. Action:

Benzodiazepine that acts as a CNS depressant via binding of GABA receptors.

IV. Indications:

- Status epilepticus
- Sedation in patients with an advanced airway

V. Contraindications:

- Use with caution in patients with renal or hepatic impairment
- Use with caution in the elderly and debilitated patients

VI. Side Effects:

Paradoxical agitation CNS depression

VII. Precautions/Comments:

May potentiate concomitant CNS depressants.

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MAINTENANCE OF CHEST TUBES

1. RMC/RCC.

2. Obtain transfer orders from the sending physician that specify the maintenance of the chest tube during transport either to gravity or mechanical suction drainage. The amount of mechanical suction ordered will remain constant during transport.

3. Perform a complete respiratory assessment and document. Document initial lung sounds and other findings. Evaluate for signs/symptoms of tension pneumothorax as defined in Region XI SMOs.

4. Mark the amount of drainage present in the drainage container prior to transport and document.

5. Keep the drainage container below the level of the chest at all times. Do not allow the drainage container to tip over.

6. If indicated in the transfer orders, connect the chest tube to suction.

7. Mark the amount of drainage in the drainage container at the completion of transport, dating and timing the entry. Document color and amount of drainage. If drainage is greater than100 cc/hr., immediately notify medical control. For hemothorax with persistent output monitor, for signs of shock.

8. Re-assess the patient's respiratory status during the transport. Evaluate for signs and symptoms of tension pneumothorax (as defined above). For any significant change in condition, follow Region XI SMOs and contact medical control.

9. If the chest tube becomes partially dislodged, **DO NOT** push the tube back into the chest. Secure the tube in place and assess for signs and symptoms of a tension pneumothorax and follow Region XI SMOs.

10. If the chest tube becomes completely dislodged, place an occlusive dressing (tape on three sides) over the insertion site and contact medical control. Monitor for tension pneumothorax and treat according to Region XI SMOs.

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MAGNESIUM SULFATE

I. Procedure:

1. RMC/RCC.
2. Verify dose/ concentration and infusion rate on the transferring facility's Medical Administration Record (MAR) and IV pump to confirm the patient's dose.
3. Continue the infusion at the rate ordered by the sending physician.
4. If available: obtain and document key labs: calcium, magnesium.
5. Monitor patient for magnesium toxicity (hypotension, facial flushing, lethargy, respiratory depression).
6. If signs or symptoms of magnesium toxicity occurs, discontinue the medication infusion and contact medical control. In severe cases, 1-2 grams of calcium gluconate IV may be recommended by medical control to reverse toxicity.
7. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and notify medical control for further direction.

II. Dose:

- Severe pre-eclampsia or eclampsia: Maintenance of Infusion only.
- Usual dose: 4 - 5 g IV in 250 ml. Maximum infusion rate is 150mg/min.
- Asthmatics: Usual dose: 2gm/50 ml NS infused over 10-30 minutes.

III. Actions:

- For eclamptic seizures: works as an anticonvulsant, reduces muscle contractions by interfering with the release of acetylcholine.
- For asthmatic bronchospasm: causes bronchial smooth muscle relaxation.

IV. Indications:

Seizure prevention in preeclampsia and eclampsia, hypomagnesaemia, acute asthma exacerbation.

V. Contraindications:

Pregnant women in actively progressing labor, heart block

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VI. Side Effects:

- Magnesium Toxicity - greater than 4 mEq/L - Decreased reflexes, decreased muscle strength, somnolence, hypotension, bradycardia
- Magnesium Toxicity - greater than 10 mEq/L - Muscle paralysis, respiratory failure, severe hypotension, complete heart block, cardiac arrest

VII. Precaution/Comments:

- *CNS depressants*: May have additive effect
- Neuromuscular blockers: May cause increased neuromuscular blockade

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MANNITOL

I. Procedure:

1. RMC/RCC.
2. Verify dose/ concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Administration must be through an inline filter.
4. Document urine output prior to transport and upon completion of transfer.
5. If pump failure occurs and cannot be corrected, discontinue the medication infusion and notify medical control for further direction.

II. Dose:

- Maintenance of medication infusion only
- For intracranial pressure or cerebral edema
- Adults: 2g/kg as a 15%, 20%, or 25% IV solution over 30 – 60 minutes

III. Action:

Osmotic diuretic and plasma expansion

IV. Indications:

Reduction of increased intracranial pressure, cerebral edema, or intraocular pressure.

V. Contraindications:

Severe pulmonary congestion, pulmonary edema, active intracranial bleeding

VI. Side Effects:

Seizures, hypotension, hypertension, heart failure, tachycardia, chest pain

VII. Precautions/Comments:

Do not give with blood products or potassium chloride

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MECHANICAL VENTILATOR TRANSPORTS

1. RMC/RCC.

2. Obtain transfer orders from the sending physician that specifies the patient's current ventilator settings (Mode, FIO2, tidal volume, rate, PEEP, pressure support, CPAP, BiPAP) and sedation if applicable.

3. Perform a complete respiratory assessment and document. Document initial lung sounds and every time patient is moved. Document additional pertinent findings (for endotracheal tube-document size, placement marking, and securing device in place. For tracheostomy tube-document size and oral airway).

4. Suction patient as needed and confirm integrity of airway ventilation system.

5. Set the transport ventilator parameters to match the patient's current ventilator settings and attach the patient to the transport ventilator.

6. . For chronically ventilated patients with a tracheostomy tube EtCO2 is not necessary unless there is a change in clinic status. For all other ventilated patients continuous EtCO2 is mandatory.

7. Adjust ventilator settings for patient oxygenation and comfort. Document in change in ventilator settings

8. Reassess the patient and document airway status after each patient movement.

9. If the patient requires emergent intubation while on scene, after confirming tube placement per Region XI SMOs, place the patient on the standard adult ventilator settings for transport:(for example AC, TV 6-8 cc per kg, RR 12, PEEP 5 and FIO2 100%) unless otherwise specified by transferring facility's physician or respiratory therapist.

10. If ventilator failure occurs and cannot be corrected, discontinue the vent and initiate ventilation by bag valve mask.

11. Administer pain control and then sedation for patients who appear anxious or uncomfortable after reassessment is completed. Verify tube placement, lung sounds, ETCO2, and evaluate for DOPE (dislodgement of tube, obstruction, pneumothorax and equipment). Complete and document a RAAS/MAAS score to determine and evaluate the effectiveness of sedation. Refer to appendix for sedation score details.

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Dosing for pain control and sedation for patients NOT on a sedation or analgesic infusion:

- Fentanyl should initially be provided for pain control before sedation.

ADULTS:

- Fentanyl 25-50 mcg slow IVP initial dose.
- May repeat fentanyl 25-50 mcg IVP in 5 minutes if no improvement.

- Midazolam 2mg IVP initial dose.
- If anxiety is not improved in 5 minutes, repeat Midazolam 2mg IVP
- May repeat Midazolam in 2 mg increments after patient reassessment
- *Not to exceed total maximum dose of 10 mg*

PEDIATRICS:

- Fentanyl 1-2 mcg/kg IV push

- Midazolam 0.05 – 0.1 mg/kg SLOW IV push over 2- 3 minutes (maximum initial dose 2 mg)
- If anxiety is not improved in 10 minutes, may repeat 0.025 -0.05 mg slow IV push over 2 – 3 min
- *Not to exceed total maximum dose of 5 mg*

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MIDAZOLAM (VERSED) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Maintain infusion rate as specified in transfer orders.
4. If available, obtain and document key lab values: liver enzymes, BUN, creatinine, sodium, potassium, digoxin.
5. Patients transported with a midazolam infusion require a secured advanced airway confirmed at the sending hospital.
6. Evaluate the patient's baseline level of sedation utilizing the GCS (Glasgow Coma Scale) and sedation scale (RASS or MAAS) and document. Refer to the appendix for sedation scale.
7. If an IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Maintain infusion rate as specified by sending physician
- Usual dosing range is 2 – 4 mg/hr for adults

III. Action:

Benzodiazepine that acts as a CNS depressant via binding of GABA receptors.

IV. Indications:

- Status epilepticus
- Sedation in patients with an advanced airway

V. Side Effects:

- Respiratory depression, hypotension, over sedation

VI. Precautions/Comments:

- May potentiate concomitant CNS depressants.
- For agitation:
  1. Evaluate the patient for uncontrolled pain. Treat pain with fentanyl as indicated in the mechanical ventilation SMO.
  2. Once pain is adequately treated and agitation is controlled, administer midazolam 2 mg IV and contact medical control for further guidance.

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MILRINONE (PRIMACOR) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medical Administration Record (MAR) and the IV pump to confirm dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If systolic blood pressure or mean arterial pressure drops significantly, initiate a 300 ml NS bolus.
5. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further direction.

II. Dose:

- Maintenance of infusion only
- IV infusion of 0.375 to 0.75 mcg/kg/min

III. Action:

Produces inotropic action by increasing cellular levels of cAMP (promotes muscle contraction in the heart) and vasodilation by relaxing vascular smooth muscle

IV. Indications:

Inotropic support in heart failure

V. Contraindications:

- Hypersensitivity
- Severe aortic or pulmonic valvular disease

VI. Side Effects:

Ventricular arrhythmias, hypotension, headache

VII. Precautions/Comments:

- Caution with atrial flutter or atrial fibrillation
- Drug interactions with furosemide and procainamide, these combinations can cause medication precipitation and should not be mixed.

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NICARDIPINE (CARDENE) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration, and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. Titrate the medication infusion rate by 2.5 mg/hr every 15 minutes as needed to maintain the systolic blood pressure as directed by the sending physician.
5. If systolic blood pressure decreases below the parameters directed by the sending physician, decrease the infusion rate by 2.5 mg/hr until the blood pressure returns to the prescribed parameters. Administer a 300 ml NS bolus as needed.
6. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further direction,

II. Dose:

- Usual dose: 5 – 15 mg/hr
- Maximum dose: 15 mg/hr

III. Actions:

- Inhibits calcium ion influx across cardiac and smooth muscle cells
- Dilates coronary arteries and arterioles

IV. Indications:

- Hypertensive emergencies such as stroke
- Chronic stable angina

V. Contraindications:

- Advanced aortic stenosis
- Caution in hypotension, heart failure, impaired renal or liver function

VI. Side Effects:

Palpitations, peripheral edema, headache, dizziness, flushing, angina, tachycardia

VII. Precautions/Interactions:

- May cause reflex tachycardia
- *Digoxin*: May increase digoxin level
- *Fentanyl*: May cause severe hypotension
- Drug interactions with: ampicillin, furosemide, heparin, lactate ringers solution, sodium bicarbonate, use alternate IV site for administration.

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NITROGLYCERIN (NitroStat, Nitro-Dur, Nitro-Bid) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify dose/concentration and infusion rate from the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. If available, obtain and document key labs: cardiac enzymes, sodium, potassium.
4. Obtain titration parameters from sending physician.
5. In the absence of sending physician orders, monitor the blood pressure. If a significant decrease in the systolic blood pressure (SBP) and the patient becomes symptomatic or the SBP is less than 90 mmHg, decrease the infusion. If systolic BP drops to 80mmHg discontinue the medication infusion, consider a 300 ml 0.9NS bolus per Region XI SMOs and contact medical control.
6. Adjust the infusion rate if the patient experiences chest discomfort, hypotension or other ischemic symptoms within the parameters as defined by the sending physician. Any rate changes should not exceed more than 5mcg/min every 5 minutes.
7. If pump failure occurs and cannot be corrected, discontinue the medication infusion. In this case, and if the patient has persistent ischemic symptoms, administer one nitroglycerin tablet 0.4 mg by sublingual route. May repeat every 3 minutes (maximum dose 3) and notify medical control for further direction.

II. Dose:

- Continuous infusion starting at 5 mcg/minute.
- Maximum dose 400 mcg/minute

III. Actions:

Vasodilator medication that dilates both veins and arteries decreasing both preload and afterload. Increases blood flow throughout the collateral coronary vessels

IV. Indications:

- Acute coronary syndrome (ACS) in patients who have not responded to sublingual nitroglycerin
- Congestive heart failure
- Hypertensive emergencies

V. Contraindications:

- Patients with increased intracranial pressure
- Patients with orthostatic hypotension

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VI. Side Effects:

- Headaches
- Hypotension
- Palpitations

VII. Precautions/Comments:

- May interfere with the anticoagulant effect of heparin.
- May cause profound hypotension in patients concomitantly taking medications for erectile dysfunction

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NOREPINEPHRINE (LEVOPHED) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/ concentration, and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Obtain titration parameters from sending physician.
4. In the absence of sending physician orders:
    a. Titrate the medication infusion rate as needed to maintain a systolic blood pressure (SBP) of 90 -100 mmHg.
    b. If the patient's SBP increases to greater than or equal to 110 or tachycardia greater than 150 bpm, decrease the infusion rate until BP or HR decreases. If SBP or mean arterial pressure MAP drops significantly, initiate a 300 ml NS bolus.
5. If pump failure occurs and cannot be corrected, discontinue the medication infusion and notify medical control.

II. Dose:

Doses typically range from 2 – 30 mcg/min

III. Actions:

Vasopressor with primarily alpha adrenergic effects causing vasoconstriction. Also, inotropic stimulation of heart and dilator of coronary arteries.

IV. Indications:

To maintain blood pressure in acute hypotensive states after adequate fluid resuscitation.

V. Contraindications:

Do not administer prior to adequate fluid resuscitation.

VI. Side Effects:

- Headache, anxiety, dizziness, tremors
- Bradycardia, severe hypertension, arrhythmias
- Bronchospasm, respiratory distress

VII. Precautions/Comments:

Antihistamines, atropine: Can cause hypertensive crisis

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OCTREOTIDE (SANDOSTATIN) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose, concentration, and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If available: obtain key lab values: sodium, potassium, glucose
5. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further direction.

II. Dose:

- Maintenance of infusion only
- Usual dose: 25 to 50 mcg/hr

III. Actions:

Mimics action of naturally occurring somatostatin, slows intestinal function which decreases splanchnic blood flow

IV. Indications:

Variceal bleeding

V. Contraindications:

Hypersensitivity

VI. Side Effects:

Arrhythmias, bradycardia, abdominal pain, dizziness, headaches, blurred vision, Hypoglycemia, hyperglycemia

VII. Precautions/Comments:

Incompatible with TPN, use a different IV site for infusion.

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ONDANSETRON (ZOFRAN)

I. Procedure:

1. RMC/RCC.
2. Assess and document the patient's symptoms of nausea and vomiting and response to medication.

II. Dose:

Adult:
- 4mg ODT, IV, IM for nausea. Reassess after 5 minutes
- May repeat to a maximum of 8 mg

Pediatrics: 6 months – 12 years
- IV Route: Weight < 40 kg – administer 0.15mg/kg IVP
  Weight >40kg – administer 4 mg IVP
- Oral Route: Weight 8-15 kg – administer 2 mg po
  Weight 16-30 kg – administer 4 mg po

III. Action:

Anti-emetic medication that is a selective antagonist of a specific type of serotonin receptor located in the CNS at the chemoreceptor trigger zone and in the peripheral nervous system on the nerve terminals of the vagus nerve

IV. Indications:

Symptomatic nausea and vomiting

V. Contraindications:

- Use with caution in patients with liver failure
- Cardiac arrhythmias

VI. Side Effects:

- Dizziness, headache, extrapyramidal syndrome
- Arrhythmias, chest pain
- Hypoxia
- QT prolongation

VII. Precautions/Comments:

Use with caution in patients with pre-existing QT prolongation

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PANTOPRAZOLE (PROTONIX) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration, and infusion rate on the transferring facility's Medication Administration Record (MAR) and IV pump to confirm the patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If available: obtain key lab values: glucose, liver function tests, magnesium.
5. If IV pump failure occurs and cannot be corrected, discontinue the medication infusion and notify medical control for further direction.

II. Dose:

- Maintenance of infusion only
- Usual dose: 8mg/hr IV

III. Action:

Inhibits proton pump activity to suppress gastric acid secretion

IV. Indications:

- Erosive esophagitis with gastroesophageal reflux disease (GERD), Zollinger-Ellison Syndrome.
- Treatment or prevention of bleeding peptic ulcers

V. Contraindications:

Hypersensitivity

VI. Side Effects:

Abdominal pain, diarrhea, nausea, dizziness, chest pain, hyperglycemia, arthralgia, dyspnea, headache

VII. Precautions/Comments:

- *Warfarin*: May increase INR and PT
- *Drug interaction with midazolam*: Use a different IV site for administration.

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PHENYLEPHRINE (NEO-SYNEPHRINE) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Obtain titration parameters from sending physician.
4. In the absence of sending physician orders:
    a. Titrate the medication infusion rate as needed to maintain a systolic blood pressure (SBP) of 90 -100 mmHg.
    b. If the patient's SBP increases to greater than or equal to 110 mmHg or tachycardia greater than 150 bpm, decrease the infusion rate until blood pressure or heart rate decreases. If SBP or mean arterial pressure (MAP) drops significantly, initiate a 300 ml NS bolus.
5. If an IV pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control.

II. Dose:

- Usual dosing start at 100-180mcg/min IV and titrate until blood pressure stable
- Maintenance: 40-60 mcg/min IV

III. Action:

Stimulates alpha adrenergic receptors, producing arterial vasoconstriction (sympathomimetic)

IV. Indications:

Shock

V. Contraindications:

Do not administer prior to adequate fluid resuscitation.

VI. Side Effects:

Arrhythmias, hypertension, palpitations, reflex bradycardia

VII. Precautions/Comments:

- Severe bradycardia and reduced cardiac output can occur in patients with preexisting cardiac dysfunction
- May cause angina
- Can cause significant hypertension in patients taking monoamine oxidase inhibitors
- Extravasation necrosis

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POTASSIUM CHLORIDE (KCL)

I. Procedure:

1. RMC/RCC.
2. Verify dose/concentration and infusion rate from the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm patient's dose.
3. If available, obtain and document key labs: sodium, potassium, BUN.
4. Monitor patient's cardiac rhythm for signs and symptoms of potassium toxicity(see side effects)
5. If pump failure occurs and cannot be corrected, discontinue the medication infusion and notify medical control.

II. Dose:

- Maintenance of infusion only
- **Medication concentrations will not exceed 40 mEq per liter of fluid.**
- **Maximum infusion rate of potassium chloride is 10mEq/hr through a peripheral line or 20mEq/hour through a central line.**

III. Actions:

Maintains cardiac membrane potential preventing arrhythmias

IV. Indications:

Hypokalemia

V. Contraindications:

Severe renal impairment, acute dehydration, hyperkalemia

VI. Side Effects:

- Hyperkalemic effects on cardiac conduction including prolonged P-R interval; loss of P wave, complete heart block, ventricular fibrillation, cardiac arrest
- Hypotension
- Respiratory paralysis
- Severe burning at the infusion site

VII. Precautions/Comments:

- ACE inhibitors, digoxin and potassium-sparing diuretics: May cause hyperkalemia
- Drug incompatibility can occur with the following: amoxicillin, diazepam, dobutamine, mannitol, fat emulsions, phenytoin, and administration should be on an alternate IV location.

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SODIUM BICARBONATE INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm the patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If available, obtain key labs: basic metabolic profile, pH.
5. If a pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further directions.

II. Dose:

Dose: 2– 5 mEq/kg, average infusion rate100-200 ml/hr or as directed by sending physician

III. Actions:

Restores buffering capacity of the body and neutralizes excess acid

IV. Indications:

Metabolic acidosis, urinary alkalization, overdoses such as tricyclic antidepressant or aspirin

V. Contraindications:

Metabolic or respiratory alkalosis, hypocalcemia, patients with low chloride from vomiting or continuous gastrointestinal suction, hypokalemia

VI. Side Effects:

Metabolic acidosis, hypokalemia, hypernatremia, tetany, edema, gastric distension

VII. Precautions/Comments:

Drug interactions with: most antibiotics, diazepam, diltiazem, dobutamine, dopamine, fat emulsions, lidocaine, magnesium sulfate, meperidine, midazolam, morphine.
When given, the drug inactivates catecholamines and forms a precipitate with calcium.

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VASOPRESSIN (PITRESSIN) INFUSION

I. Procedure:

1. RMC/RCC.
2. Verify the dose/concentration and infusion rate on the transferring facility's Medication Administration Record (MAR) and the IV pump to confirm patient's dose.
3. Initiate the infusion at the rate ordered by the sending physician.
4. If available: obtain key labs: sodium, potassium.
5. If an arrhythmia develops and the patient's condition changes, follow the most appropriate Region XI ALS SMO and contact medical control.
6. If pump failure occurs and cannot be corrected, discontinue the medication infusion and contact medical control for further direction.

II. Dose:

0.01 to 0.07 units/minute

III. Action:

Directly stimulates smooth muscle receptors resulting in vasoconstriction without inotropic or chronotropic effects

IV. Indications:

Septic shock, hypotension, GI bleeding, diabetes insipidus

V. Contraindications:

Chronic nephritis

VI. Side Effects:

Arrhythmias, cardiac arrest, myocardial ischemia, decreased cardiac output, bronchoconstriction, vasoconstriction, angina, abdominal cramps, nausea, vomiting, diaphoresis

VII. Precautions/Comments:

Caution in patients with seizures, migraines, asthma, CV disease children and elderly

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VENTRICULAR ASSIST DEVICE (VAD)

I. Procedure:

1. RMC/RCC.
2. Obtain heart rate from monitor since a pulse may not be palpable.
3. Auscultate left chest to verify VAD is functioning.
4. Assess and document signs of perfusion including capillary refill.
5. Assess driveline for signs of infection and document.
6. Obtain blood pressure with Doppler if unable to obtain manual or automatic reading.
7. Confirm patient is on battery power and that the batteries are fully charged.
8. Verify all of the patient's VAD equipment is prepared for transport(extra batteries, controller, and AC power equipment)
9. Obtain the VAD coordinator's emergency contact information before transport.
10. If the patient's condition changes enroute, follow the appropriate Region XI ALS SMO and contact medical control for further direction.

II. VAD Emergency Management:

1. Refer to the Region XI ALS VAD SMO regarding management.
2. Most VAD patients should have advanced directives. Contact VAD coordinator if CPR needs to be performed.
3. Routine ACLS drug interventions including defibrillation and cardioversion can be administered to VAD patients.
4. Contact the patient's VAD coordinator for direction regarding alarms during transport.

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Richmond Agitation Sedation Scale (RASS) *

Score	Term	Description	
+4	Combative	Overtly combative, violent, immediate danger to staff	
+3	Very agitated	Pulls or removes tube(s) or catheter(s); aggressive	
+2	Agitated	Frequent non-purposeful movement, fights ventilator	
+1	Restless	Anxious but movements not aggressive vigorous	
0	Alert and calm		
-1	Drowsy	Not fully alert, but has sustained awakening (eye-opening/eye contact) to *voice* **(≥10 seconds)**	Verbal Stimulation
-2	Light sedation	Briefly awakens with eye contact to *voice* **(<10 seconds)**	Verbal Stimulation
-3	Moderate sedation	Movement or eye opening to *voice* **(but no eye contact)**	Verbal Stimulation
-4	Deep sedation	No response to voice, but movement or eye opening to *physical* stimulation	Physical Stimulation
-5	Unarousable	No response to *voice or physical* stimulation	Physical Stimulation

Procedure for RASS Assessment

1. Observe patient
   a. Patient is alert, restless, or agitated. **(score 0 to +4)**
2. If not alert, state patient's name and *say* to open eyes and look at speaker.
   b. Patient awakens with sustained eye opening and eye contact. **(score –1)**
   c. Patient awakens with eye opening and eye contact, but not sustained. **(score –2)**
   d. Patient has any movement in response to voice but no eye contact. **(score –3)**
3. When no response to verbal stimulation, physically stimulate patient by shaking shoulder and/or rubbing sternum.
   e. Patient has any movement to physical stimulation. **(score –4)**
   f. Patient has no response to any stimulation. **(score –5)**

* Sessler CN, Gosnell M, Grap MJ, Brophy GT, O'Neal PV, Keane KA et al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344.

* Ely EW, Truman B, Shintani A, Thomason JWW, Wheeler AP, Gordon S et al. Monitoring sedation status over time in ICU patients: the reliability and validity of the Richmond Agitation Sedation Scale (RASS). JAMA 2003; 289:2983-2991.

MOTOR ACTIVITY ASSESSMENT SCALE[1]

SCORE	DESCRIPTION	DEFINITION
0	Unresponsive	Does not move with noxious stimulus*
1	Responsive only to noxious stimuli	Opens eyes OR raises eyebrows OR turns head toward stimulus OR moves limbs with noxious stimulus*
2	Responsive to touch or name	Opens eyes OR raises eyebrows OR turns head toward stimulus OR moves limbs with when touched or name is loudly spoken
3	Calm and cooperative	No external stimulus is required to elicit movement AND patient is adjusting sheets or clothes purposefully and follows commands
4	Restless and cooperative	No external stimulus is required to elicit movement AND patient is picking at sheets or tubes OR uncovering self and follows commands
5	Agitated	No external stimulus is required to elicit movement AND attempting to sit up OR moves limbs out of bed AND does not consistently follow commands (e.g., will lie down when asked but soon reverts back to attempts to sit up or move limb out of bed)
6	Dangerously agitated, uncooperative	No external stimulus is required to elicit movement AND patient is pulling at tubes or catheters OR thrashing side to side OR striking at staff OR trying to climb out of bed AND does not calm down when asked
* Noxious stimulus, suctioning OR 5 secs. of vigorous orbital, sternal, or nail bed pressure		

[1] **Citation:**
Devlin JW, Boleski G., et. al. *Motor Activity Assessment Scale: A valid and reliable sedation scale for use with mechanically ventilated patients in an adult surgical intensive care unit.* Critical Care Medicine. 27(7). July, 1999. 1271-1275.

GLASGOW COMA SCALE (GCS)

TOTAL 3 to 15

EYES OPEN:	Spontaneously	4
	Verbal	3
	Pain	2
	None	1
BEST VERBAL:	Oriented	5
	Confused	4
	Inappropriate	3
	Incomprehensible	2
	None	1
BEST MOTOR:	Obeys	6
	Localizes	5
	Withdraws	4
	Abnormal Flexion	3
	Abnormal Extension	2
	None	1

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Suspected Transfusion Reaction-Signs and Symptoms

Type of Reaction	Signs and Symptoms	Timing of Symptoms	Interventions
ACUTE (less than 24 hours)			
Minor Allergic Reaction	Pruritis, mild rash, urticaria, flushing	During transfusion up to 2-3 hours from start	Contact Medical Control
Febrile Non-Hemolytic	Temp increase $\geq$ 38C (100.4F) or $\geq$ 1C from pre-transfusion value, chills, rigors, headache, malaise, vomiting, nausea	During transfusion, usually towards the end or when the transfusion is completed	Stop transfusion Contact Medical Control
Acute Hemolytic (AHTR)	Temperature $\geq$ 39C (102.2F), chills rigors, fever, hemoglobinuria, less common: renal failure, hypotension an/or tachycardia, DIC, oliguria, oozing from IV site, back pain, pain along transfusion site	Usually within first 15 minutes but may be later	Stop transfusion Contact Medical Control Monitor for hypotension
Transfusion Associated Circulatory Overload (TACO)	Dyspnea, orthopnea, productive cough with pink frothy sputum, cyanosis, tachycardia, hypertension, headache	Within several hours of transfusion	Stop transfusion Contact Medical Control, O2, consider CPAP, BIPAP, elevate head of bed
Severe Allergic/Anaphylactic	Urticaria, erythema, respiratory distress, hypotension, laryngeal/pharyngeal edema, Bronchospasm, nausea, vomiting, dyspnea, cyanosis, tachycardia, substernal pain, loss of consciousness, cardiac arrhythmia, cardiac arrest	Severe allergic within 2-3 hours of start of transfusion. Anaphylactic: usually early in transfusion (1-45 minutes) after small volume of products transfused	Stop transfusion Follow anaphylaxis SMO Contact Medical Control
Transfusion Related Acute Lung Injury (TRALI)	Acute respiratory, hypoxemia, chills, fever, cyanosis, hypotension, tachycardia, bilateral pulmonary edema	Within 1-2 hours during transfusion or within 6 hours post-transfusion	Stop transfusion Contact Medical Control O2, consider CPAP, BIPAP, elevate head of bed
Transfusion Associated Dyspnea (TAD)	Respiratory distress within 24 hours of transfusion that does not meet the criteria of TRALI, TACO or allergic reaction. Respiratory distress not explained by patient's underlying condition	Within 24 hours of transfusion	Contact Medical Control, O2
Hypotensive	Flushing, abrupt onset of hypotension with or without bradycardia, nausea, dyspnea, urticaria	Within 5 minutes after beginning of transfusion	Stop transfusion Contact Medical Control O2, consider fluid challenge
Bacterial Contamination	Fever, shock, DIC, nausea, vomiting, tachycardia, hypotension, chills, rigors, SOB, circulatory collapse	Within 4 hours of transfusion	Stop transfusion Contact Medical Control O2, consider fluid challenge