

Tier I Critical Care Transport General Guidelines

1. **Tier I Critical Care Transport Paramedic will confirm that patient meets criteria for transport according to the MWLCEMS Critical Care Transport Plan for a Tier I patient, and the transfer order is in place. A copy of the patient medical record and transfer forms will be obtained.**
2. Tier I Critical Care Transport paramedic will perform a face to face bedside report and assessment with the transferring nurse to establish a baseline assessment.
3. A Critical Care Transport form will be used on all patient and include at minimum, but not limited to:
 - a. Patient name
 - b. Transferring physician and nurse
 - c. Receiving facility and physician
 - d. Diagnosis
 - e. Allergies
 - f. Advanced Directives
 - g. Respiratory Assessment – including oxygen, oxygen saturation, capnography (when applicable), lung sounds, respiratory effort, any respiratory adjuncts in use and patients response
 - h. Cardiac Assessment – including skin parameters, VS, urine output, cardiac rhythm
 - i. Neuro assessment
 - j. Skin – Documentation of any skin breakdown, assessment of all invasive lines and tubes for skin problems
 - k. Labs – any pertinent abnormal labs
 - l. Fluids and Medications – All IV sites, fluids and rates, medications and dose infusions
 - m. Documentation of any invasive catheters
 - n. Pain assessment
 - o. Last vital signs
 - p. Any other information the provider feels is relevant
 - q. Time OLMC contacted with report
4. Transfer procedure will be explained to patient and family
5. Patient will be prepared for transport.
6. Tier I Critical Care Transport paramedic will call report to the Medical Control Physician prior to leaving the transferring unit.
7. MWLCEMS System Standard Operating Procedures/Standing Medical Orders and Tier I Critical Care Transport Standard Operating Procedures will be in effect during the transport. Any transfer orders that deviate from the MWLCEMS System Standard Operating Procedures must be discussed with and approved by the Medical Control Physician prior to transfer.
8. Vital signs and mental status will be assess and recorded every 15 minutes during transport or more frequently as indicated by patient condition
9. Ongoing reassessment throughout transport.
10. Any changes in the patient's condition during transport must be reported to Medical Control. This includes but is not limited to:
 - a. Deviation from patients normal vital signs
 - b. Signs of respiratory distress
 - c. Mental status changes
 - d. Cardiac dysrhythmias
11. All care will be documented in the patient care record.
12. Upon arrival at receiving facility; face to face bedside report with the receiving nurse will take place.

If at any time during transport the patient becomes unstable the Tier I Critical Care Transport paramedic will divert to the closest hospital and OLMC will be notified

Tier I Critical Care ALS Transport IV Medications and Infusions

1. All fluids and medications will be delivered via an infusion pump during transfer.
2. Bedside assessment with transferring nurse to include:
 - a. Assessment of IV site
 - b. Patency of line
 - c. Confirmation of IV fluid rates
 - d. Confirmation of correct medication, dose and infusion rate
3. Ensure all lines and ports are labeled with the names of the infusing fluids or medications
4. Confirms that the medication and dose falls within MWLCEMS System approved medication and dosage limits.
5. IV site will continue to be inspected during transfer for signs of infiltration
6. In the event a patient needs a fluid bolus, only 0.9NS will be used to bolus the patient.
7. If the Tier I Critical Care Transfer Medic is presented with a pump he/she is not familiar with, it is his/her responsibility to have the transferring facility in-service them on the pump.

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

Approved Tier I Medications

See individual SOPs for Indications, Contraindications, Side Effects, Approved Dosing and Management Guidelines

Fentanyl
Heparin
Hydromorphone
Lorazepam
Maintenance IV fluids other than 0.9 NS
Morphine
Nitroglycerin
Potassium

Tier I Critical Care ALS Transport Feeding Tubes

Patients will not be transported with tube feeding running. If feeding still infusing at time of transfer, it will be stopped and disconnected by transferring nurse.

Tier I Critical Care Transport

Heparin

1. Class: Anticoagulant
2. Actions: Prevents conversion of fibrinogen to fibrin and prothrombin to thrombin by enhancing inhibitory effects of antithrombin III. The drug does not dissolve existing clots, but can prevent clot extension and inhibit new clot formation.
3. Indications: Pulmonary emboli, deep-vein thrombosis, myocardial infarction, open heart surgery, disseminated intravascular clotting syndrome (DIC), atrial fibrillation with embolization, as an anticoagulant in transfusion and dialysis procedures, prevention of DVT/PE
4. Contraindications: Known hypersensitivity, active bleeding, blood dyscrasias (except DIC), suspected intracranial hemorrhage, severe hypertension, peptic ulcer disease, open wounds, recent surgery, endocarditis, shock, threatened abortion
5. Side effects: Spontaneous hemorrhage, anaphylactoid reactions, bronchospasm, hyperkalemia in patients with renal failure, chest pain, thrombocytopenia, fever and chills
6. Pharmacokinetics: IV: peak in 5 min, duration 2 – 6 hours; half-life 1 ½ hours, excreted in the urine, 95% bound to plasma proteins, does not cross placenta or alter breast milk; removed from the system via the lymph and spleen
7. Special Considerations: Monitor for signs of hemorrhage, both internal and external; Use cautiously in alcoholism, liver disease, renal disease and in older adults; Avoid IM, arterial or venous punctures; hold pressure for longer than usual if punctures are necessary

Dosage: Maintenance drip up to 1500 units/hr

Management Guidelines:

Hemorrhage

1. Discontinue Heparin Infusion
2. Reassess patient, monitor for signs of shock
3. Initiate hemorrhage control
4. Contact Medical Control with patient update and for further orders

Cardiac Dysrhythmias

1. Follow appropriate SOP
2. Contact Medical Control for further orders.

Cardiac Arrest:

1. Discontinue Heparin infusion and follow appropriate SOP
2. Contact Medical Control and divert to the closest acute care hospital

Cardiac Arrest:

1. Discontinue Heparin infusion and follow appropriate SOP
2. Divert to the closest acute care hospital facility and notify medical control

Stroke

1. Assess for hypotension and treat as needed
2. Assess blood glucose for hypoglycemia and treat as needed
3. Divert to the closest acute care hospital
4. Contact Medical Control for further orders

Tier I Critical Care Transport

Hydromorphone/Morphine/Fentanyl

1. Class: Narcotic analgesic
2. Actions:
 - Hydromorphone and Fentanyl – Inhibits ascending pain pathways in CNS, increases pain threshold, alters pain perception
 - Morphine – Depresses pain impulse transmission at the spinal cord level by interacting with opioid receptors. Has mild vasodilatation properties, to include decreasing preload and afterload thereby decreasing myocardial oxygen consumption.
3. Indications: All – moderate to severe pain; Morphine only – mild to moderate congestive heart failure
4. Contraindications: Known hypersensitivity, decreased level of consciousness, hypotension, increased intracranial pressure, respiratory depression, convulsive disorder, ingested poisoning, bronchial asthma
5. Side effects: Respiratory depression, hypotension, bradycardia, or reflex tachycardia, nausea and vomiting, euphoria, drowsiness, confusion, dizziness, CNS depression, blurred vision, muscle rigidity.
6. Pharmacokinetics: Hydromorphone - Onset 5 minutes, peaks 10 – 20 minutes, duration 4 -5 hours. Metabolized by the liver and excreted by the kidneys. Crosses the placenta, excreted in breast milk. Morphine – Peak in 20 minutes, Half-life 1 ½ - 2 hrs. Metabolized by liver, crosses placenta, excreted in urine, crosses placenta, excreted in breast milk. Fentanyl – Onset immediate, peak 3 – 5 minutes, duration ½ - 1 hour; metabolized by liver, excreted by kidneys; crosses placenta; excreted in breast milk
7. Special Considerations:
 - Monitor ventilatory status (rate, depth and pulse oximeter). EtCO₂ monitoring when available
 - Maximal respiratory depression occurs 7 minutes after administration
 - Monitor BP, HR and pain response
 - Use cautiously in liver disease, renal disease, head injury, respiratory depression
 - Administer naloxone per SOP for opiate overdose or toxicity.

Dosage

Hydromorphone:

Oral: 1 – 6 mg every 4 – 6 hr (geriatric 1 – 2 mg every 4 – 6 hours)

IV: 1-2 mgs every hour with a maximum of 4 mg every 4 hours. May be infused through a PCA (Patient controlled analgesia) pump. Maximum PCA dose is 8mg/4 hours

Pediatric dose: 0.015mg/kg every 4 – 6 hours.

Morphine

Adult oral: 10 - 30mg every 4 hour as needed. Extended release (i.e. MScotin) is every 8 – 12 hours and dose may be higher

Adult 2 – 10 mg IVP slowly over 1 – 2 minutes; repeat every hour as needed.

May be infused through PCA pump. Maximum PCA dose is 30mg/4 hours

Pediatrics: 0.05 – 0.1mg/kg IVP; maximum dose of 15 mg

Fentanyl

1mcg/kg (max 100mcg) IV/IN/IO; may repeat 0.5mcg/kg (max 50 mcg) in 5 minutes. Additional doses of 0.5mcg/kg may be given every 5 minutes to a max of 300mcg with approval of OLMC

Continuous infusion: 1 – 2 mcg/kg/hg (25 – 200 mcg/hr)

Contact medical control immediately for any patient care concerns.

Tier I Critical Care Transport

Lorazepam

1. Class: Benzodiazepine; anxiolytic, sedative, anticonvulsant
2. Actions: Acts on GAMA receptors in central nervous system to induce skeletal muscle relaxation, antiolysis (preventing or reducing anxiety) and sedation. .
3. Indications: Management of anxiety and seizures
4. Contraindications: Known hypersensitivity, narrow-angle glaucoma, psychosis, pregnancy, lactation, COPD
5. Side effects: CNS depression, respiratory depression, cardiovascular depression, dry mouth, hallucinations, nausea and vomiting.
6. Pharmacokinetics:
 - Oral: onset ½ hr; peak 1 – 6 hours, duration 24 – 48 hours
 - IV: onset 5 -15 min, peak unknown, Half-life 14 hours duration 24 – 48 hours.
 - Metabolized by liver, excreted by kidneys, crosses placenta, excreted in breast milk
7. Special Considerations:
 - Monitor ventilatory status (rate, depth and pulse oximeter). EtCO₂ monitoring when available
 - Be prepared to assist ventilations when needed
 - Monitor vital signs and cardiac rhythm closely
 - Use cautiously with elderly and pediatric patients.

Dosage

For anxiety: Oral 0.5mg – 2mg every 4 – 6 hours; IV 1mg every 4 – 6 hours as needed

For seizures: 4mg slow IV (Max rate 1mg/min), may repeat in 5 – 10 minutes. Pediatric dose: 0.03-0.05 mg/kg slow IVP up to 4 mg

Contact medical control immediately for any patient care concerns.

Tier I Critical Care Transport

Nitroglycerin

1. Class: Vasodilator
2. Actions: Relaxes smooth muscles
 - a. Dilates primarily venous system, decreasing preload
 - b. Dilates arterial system at higher doses, decreasing afterload
 - c. Relieves vasospasm
 - d. Redistributes blood flow in the heart, improving myocardial O₂ consumption
3. Indications: Ischemic chest pain, acute MI, coronary artery spasm, acute left ventricular failure
4. Contraindications: Known hypersensitivity, anemia, increased intracranial pressure, cerebral hemorrhage, hypertrophic cardiomyopathy, right ventricular infarction, ingestions of erectile dysfunction medications within 24 hours.
5. Side effects: Tachycardia, hypotension, palpitations, weakness, apprehension, flushing, dizziness, syncope, headache, methemoglobinemia
6. Pharmacokinetics: IV – onset 1 -2 min, duration 3 – 5 minutes; Sublingual – Onset 1 – 3 minutes, duration 30 minutes; metabolized by the liver, excreted in the urine, half-life 1 – 4 minutes
7. Special Considerations: Monitor HR, BP and urine output closely. BP q 5 min when titrating. Compatible with heparin. Headache is usually dose related, treat with Tylenol.

Dosage: 5 – 35mcg/min – doses higher than 35 mg require Tier III transfer

Management Guidelines:

Hypotension – an acute drop in SBP by 20 mmHG with or without associated signs/symptoms

1. Discontinue Nitroglycerin infusion
2. Position the patient in trendelenberg
3. If not improved within 5 minutes, initiate a fluid bolus of 200ml, provided lung assessment is clear
4. Contact medical control with an update of the patient's condition and for further orders

Chest Pain/Pressure

1. SBP > 110mmHG: Increase O₂ and monitor for improvement. If pain continues beyond 5 minutes and infusion rate is less than 20mcg/min contact Medical Control for permission to increase infusion.
2. SBP 100 – 110 mmHG: Assess for clinical signs of hypotension. Increase O₂ and monitor for improvement in pain level. If pain continues beyond 5 minutes call Medical Control for orders.
3. SBP < 100: Initiate fluid bolus and call medical control.

Cardiac Dysrhythmias:

3. Follow appropriate SOP
4. Contact Medical Control for further orders in regards to Nitro drip

Cardiac Arrest:

3. Discontinue Nitroglycerin infusion and follow appropriate SOP
4. Divert to the closest acute care hospital facility and notify medical control

Stroke

5. Assess for hypotension and treat as needed
6. Assess blood glucose for hypoglycemia and treat as needed
7. Divert to the closest acute care hospital
8. Contact Medical Control for further orders

Tier I Critical Care Transport

Potassium

1. Class: Replacement therapy
2. Actions:
 - Promotes myocardial skeletal and smooth muscle contractility
 - Promotes transmission of nerve impulses
 - Maintains intracellular osmolality
 - Activates several enzymatic reactions
 - Helps regulate acid-base balance
 - Influences kidney function and structure
3. Indications: Treatment of hypokalemia
4. Contraindications: Renal disease (severe), severe hemolytic disease, Addison's disease, hyperkalemia, acute dehydration, extensive tissue breakdown.
5. Side effects: Bradycardia, cardiac depression, dysrhythmias, arrest, peaking T waves, lowered R and depressed RST, prolong PR interval, Widened QRS complex, confusion, burning and discomfort at the site
6. Pharmacokinetics: Immediate onset of action
7. Special Considerations:
 - Requires continuous cardiac monitoring
 - Never bolus with fluids containing Potassium
 - IV infusions should be given through a large bore IV, monitoring for extravasations
 - Infusions of greater than 10meq/hr require infusion through a central line
 - May cause burning and discomfort at the site
 - *****Potassium must never be given as a direct push, it MUST always be diluted*****

Dosage: Potassium may be mixed into a bag of maintenance fluid or may be given as a piggyback. Regardless of the which way it is given , ***the maximum infusion rate is 10meq/hr.***

Contact medical control immediately for any patient care concerns.

Tier I Critical Care Transport TPN (Total Parental Nutrition)

1. TPN is an IV nutritional supplement. In addition they may contain H2-blockers, insulin and electrolytes.
2. Administered through an IV or PICC line
3. It is customized for each patient based on estimated caloric and nutrition needs, adjusted for the patient's particular medical condition and any nutritional deficits.
4. It is prepared in the hospital pharmacy. It must be administered via an infusion pump.
5. Face to face bedside report with the transferring nurse will include inspection of site, infusion bag and pump for;
 - a. Correct patient
 - b. Patency
 - c. Infusion rate
 - d. In line filter present
6. Lab work will be reviewed, including last glucose and when next glucose is due.
7. Infusion rate will not be altered
8. No additional medications or fluids will be given through the TPN line.
- 9.

Contact medical control immediately for any patient care concerns.