

MCHENRY WESTERN LAKE COUNTY EMS SYSTEM

TIER II CRITICAL CARE ALS TRANSPORT

APPROVED MEDICATIONS FOR INFUSION

Generic Name	Trade Name	Approved Dose	Actions	Indication	Contraindications/Precautions Special Considerations
Abciximab	ReoPro	Initial IV bolus of 0.25mg/kg administered 10 – 60 minutes prior to the start of the intervention, followed by continuous infusion of 0.125mcg/kg/min (10mg/min maximum) for 12 hours	Decreases platelet aggregation by binding to glycoprotein IIb/IIIa receptors sites of the platelets	To prevent acute cardiac ischemia following percutaneous transluminal coronary angioplasty (PTCA) in patients at high risk for reclosure of affected arteries.	<p>Active pathologic bleeding within 30 days; history of bleeding abnormalities; history of CVA within the last 2 years or CVA with significant residual neurologic deficit; brain tumor; aneurysm; AV malformation; severe uncontrolled hypertension; low platelet count; recent surgery; vasculitis; known hypersensitivity.</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Monitor for bleeding ⇒ Avoid automatic blood pressure cuffs ⇒ Limit venipunctures ⇒ Use cautiously in patients weighing less than 75 kg, older adults, history of GI disease and PCTA lasting greater than 70 minutes ⇒ Do not shake the vial ⇒ Administer with aspirin and heparin ⇒ May be used in renal insufficiency patients with not adjustment in dose.

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Amiodarone	Cordarone	<p>For perfusing ventricular dysrhythmias: 150mg mixed in 50ml 0.9NS over 10 minutes, followed by 1mg/min infusion over 6 hours, which is then followed by 0.5mg/min over the next 18 hours. The maintenance infusion can continue for up to 2 -3 weeks at 0.5mg/min.</p> <p>For non-perfusing v-tach or v-fib: 300 mg IV bolus may be repeated once at 150mg after 5 – 15 minutes.</p> <p>Pediatrics: Perfusing V –tach 5mg/kg (max 150mg) mixed in .9NS slow over 20 min. V-Fib or v-tach with no pulse 5mg/kg IVP (max single dose of 300mg)</p>	Inhibits adrenergic stimulation (alpha- and beta-blocking properties), affects sodium, potassium and calcium channels, prolongs the action potential and refractory period in myocardial tissue, decreases AV conduction and sinus node function.	Initial treatment of ventricular arrhythmias, including ventricular tachycardia and v-fib; also used for atrial arrhythmias, such as atrial fibrillation, atrial flutter, and PSVT, refractory to front-line antiarrhythmics	<p>Known hypersensitivity, marked sinus bradycardia, second or third degree AV block, cardiogenic shock.</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Check potassium and magnesium levels (should attempt to correct low levels if possible before treatment) ⇒ Monitor HR, BP, ECG and neurologic status ⇒ Monitor for heart failure and respiratory issues
Bumetanide	Bumex	<p>0.5 – 2mg slow IVP over 1 -2 minutes. Repeat at 4 to 5 hour intervals to max. allowance of 10mg/day.</p> <p>Bumex may be given as a continuous drip at a rate of 0.5 – 2mg/hr</p>	Loop diuretic that blocks reabsorption of sodium and water in the renal tubules causing profound diuresis. The drug causes a diuresis that is 40 times greater than furosemide, but with a shorter half-life	Edema that is associated with acute CHF, hepatic or renal diseases; pulmonary edema; ascites; hypertension; anasarca	<p>Allergy to Bumetanide, anuria, hypotension, dehydration and hepatic coma. Monitor closely in patients with a sulfa allergy.</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Monitor VS, cardiac rhythm and urine output closely. ⇒ Check most recent electrolyte levels prior to transfer.

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Diltiazem	Cardizem	0.25 mg/kg IVP over 2 minutes, after 15 minutes if no response may be increased to 0.35mg/kg IVP over 2 minutes. If maintenance infusion is needed 5 – 15mg/hr for up to 24 hours.	Blocks the efflux calcium movement during phase II of the cardiac cycle prolonging the action potential and refractory period. Depresses automaticity in the SA and AV nodes. Prolongs the conduction time in the AV junction and increases the refractory period at the AV junction. Decreases contractility and peripheral vascular resistance.	Atrial fibrillation/flutter with rapid ventricular response; supraventricular tachycardias refractory to frontline agents such as adenosine; angina pectoris due to coronary insufficiency, hypertension and vasospasm.	<p>Hypotension, second- or third degree heart blocks without a functioning ventricular pacemaker, sick sinus syndrome, WPW syndrome and known hypersensitivity</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Use cautiously in HF, liver disease, renal disease and in older adults. ⇒ Monitor closely for hypotension and bradycardia. ⇒ Do not mix with IV beta blocker administration.
Dobutamine	Doburex	2 – 20 mcg/kg/min titrated to desired hemodynamic response.	Causes increased contractility, increased coronary blood flow and heart rate by acting on Beta – 1 receptors in the heart; minor alpha and beta 2 effects.	Short-term treatment of cardiac dysfunction secondary to poor cardiac contractility, such as decompensating cardiomyopathy and congestive heart failure.	<p>Hypertension, tachycardia, acute coronary syndrome, ventricular irritability, idiopathic hypertrophic subaortic stenosis, known hypersensitivity to sympathomimetic amines.</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Administer through a central line if possible; if administered peripherally, use a large vein ⇒ Monitor IV patency, will cause tissue necrosis if infiltration occurs. ⇒ Monitor VS and cardiac rhythm ⇒ Do not administer as an IV bolus

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Dopamine	Intropin	Begin infusion at 2 – 10 mcg/kg/min per specific SOP, titrate to desired effect. Maximum dose 20 mcg/kg/min ⇒ Dopaminergic (renal) dose: 2 – 5 mcg/kg/min ⇒ Beta agonist (cardiac) dose: 5 – 15 mcg/kg/min ⇒ Alpha agonist (vasopressor) dose: 10 - 20mcg/kg/min	Causes increased cardiac output; acts on Beta-1 and Alpha receptors causing vasoconstriction (both venous and arterial); Beta-1 stimulation produces inotropic effects with increased cardiac output; low dose causes renal and mesenteric vasodilation	To correct hemodynamic imbalance in hypoperfusion states due to causes other than volume deficit, such as sepsis, cardiogenic shock, anaphylaxis, or neurogenic shock. <i>Ensure that intravascular volume is normal before use.</i>	Hypersensitivity; ventricular irritability; tachydysrhythmias; hypertension; pheochromocytoma; patients receiving MAO inhibitors Special Considerations: ⇒ Administer through a central line if possible; if administered peripherally, use a large vein ⇒ Monitor IV patency, will cause tissue necrosis if infiltration occurs. ⇒ Monitor VS and cardiac rhythm ⇒ Do not administer as an IV bolus ⇒ Use cautiously in peripheral vascular disease
Eptifibatide	Integrilin	After an initial bolus of 180mcg/kg a maintenance infusion is initiated at 2mcg/kg/min for 72 – 96 hours.	Platelet glycoprotein antagonist. Reversibly prevents fibrinogen, von Willebrand’s factor from binding to the glycoprotein IIb/IIIa receptor, inhibiting platelet aggregation	Acute coronary syndrome with or without percutaneous coronary intervention (PCI); PCI when risk of thrombosis is high	Known hypersensitivity; active internal bleeding; significant pathologic bleeding within the last 30 days; history of CVA within in the last 2 years or CVA with significant residual neurologic deficit; brain tumor; aneurysm; or AV malformation; severe uncontrolled hypertension (SBP >200mmHg); history of bleeding disorders; thrombocytopenia; pericarditis; major surgery or trauma within the last 6 weeks Special Considerations: ⇒ Administered with aspirin and heparin ⇒ Monitor oral secretions, sputum, vomitus, stool and urine for blood ⇒ Limit venipuncture, avoid noncompressible IV sites. ⇒ Avoid automatic BP cuffs

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Esmolol	Brevibloc	Maintenance dose is usually 25 – 50mcg/kg/min	Competitively blocks stimulation of Beta -1 adrenergic receptors in the myocardium; produces negative chronotropic, inotropic activity (decreases rate of SA node discharge, increases recovery), slows conduction of AVnode, decreases heart rate, decreases O2 consumption in myocardium; also decreases rennin-aldosterone-angiotensin system at high doses; inhibits Beta-2 receptors in bronchial system slightly	Supraventricular tachycardia, non-compensatory tachycardia, hypertensive crisis, coronary artery disease (angina), hypertrophic cardiomyopathy	<p>Cardiac failure, hypotension, AV heart block greater than first degree, sinus bradycardia, moderate to severe CHF, shock</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Use cautiously with patients with a history of asthma, emphysema, CHF or kidney dysfunction. ⇒ Monitor vital signs and cardiac rhythm. If heart block, bradycardia or hypotension develops, discontinue infusion immediately. ⇒ Drug may potentiate the hypoglycemic effects of insulin and prevents sympathetic symptoms of hypoglycemia ⇒ It masks sympathetic clinical indications of shock because the receptors are blocked
Fentanyl	Sublimaze	1mcg/kg (max 100mchg) IV/IN/IO; may repeat 0.5mcg/kg (max 50mcg) in 5 minutes. Additional doses of 0.5mcg/kg may be given every 5 minutes to a max of 300mcg with online control. Continuous infusion: 1 – 2 mcg/kg/hr (25 – 200mcg/hr)	Inhibits ascending pain pathways in CNS, increases pain threshold, and alters pain perception by binding to opiate receptors.	Analgesic purposes similar to morphine	<p>Hypersensitivity; decreased level of consciousness; hypotension; increased intracranial pressure; respiratory depression; myasthenia gravis; MAO inhibitors; active labor and delivery.</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Use cautiously with head injuries (if at all), older and debilitated patients, COPD, bradydysrhythmic patients, and patients with severe pulmonary, renal or hepatic diseases

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Heparin		Maintenance drip up to 1500 units/hr.	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.	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	<p>Known hypersensitivity, active bleeding, blood dyscrasias (except DIC), suspected intracranial hemorrhage, severe hypertension, peptic ulcer disease, open wounds, recent surgery, endocarditis, shock, threatened abortion</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Monitor for signs of hemorrhage, both internal and external ⇒ Monitor PTT and platelets ⇒ Use cautiously in alcoholism, liver disease, renal disease and in older adults ⇒ Avoid IM, arterial or venous punctures if at all possible ⇒ Hold pressure for longer than usual if punctures are necessary
Hydromorphone	Dilaudid	PCA pump max 8mg/4hr	Inhibits ascending pain pathways in CNS, increases pain threshold, alters pain perception.	Moderate to severe pain	<p>Known hypersensitivity, hemorrhage, asthma and increased intracranial pressure</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Use cautiously in liver disease, renal disease, head injury, respiratory depression ⇒ Maximal respiratory depression occurs within 7 minutes after IV dose. ⇒ Naloxone can be used as an antagonist in cases of overdose or toxicity.

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Labetalol	Normodyne Trandate	2mg/min to total dose 300mg	Nonselective beta- blocking agent somewhat similar to Esmolol, it slows sinoatrial (SA) discharge, AV conduction, and lessens ventricular inotropy, and also causes alpha blockade effects which result in vasodilation and a diminishment in peripheral resistance.	Hypertensive emergencies especially in hypertension- induced neurologic emergencies with resultant increased intracranial pressure (intracranial hemorrhage, traumatic brain injury).	Known hypersensitivity, shock, second or third degree AV block, sinus bradycardia, sick sinus syndrome, bronchial asthma, uncontrolled heart failure Special Considerations: ⇒ Monitor vital signs and cardiac rhythm closely ⇒ Use cautiously in diabetes mellitus, renal disease, hepatic disease, thyroid disease, COPD, bronchospasm ⇒ Keep patient supine for 3 hours after IV administration
Lidocaine		Adult: Ventricular fibrillation or pulseless ventricular tachycardia: If no IV/IO present 2mg/kg ET then 1 mg/kg every 3 – 5 minutes to 6mg/kg ET Unstable ventricular tachycardia with a pulse: If no IV/IO present 1mg/kg every 3 – 5 min up to 3mg/kg ET Maintenance Drip: 1 -4 mg/min (therapeutic blood level is 2 – 5 mcg/ml) DAI premed: 1.5mg/kg IVP – give at least 2 minutes prior to intubation attempt Pediatric maintenance dose is 20 – 50 mcg/kg/min	Blocks sodium influx during phase 0 of the cardiac cycle, shortens repolarization and action potential duration, stabilizing the cardiac membrane and suppressing ventricular automaticity in ischemic tissue. In addition it is thought to raise the ventricular fibrillation threshold.	Management of acute ventricular dysrhythmias such as ventricular tachycardia, ventricular fibrillation, PVC's, and wide-complex tachycardia of unknown etiology. Also used as an induction agent for blunting intracranial pressure elevations with intubation for the patient with suspected head injury or stroke.	Known hypersensitivity, AV block, supraventricular dysrhythmias, and sick sinus syndrome Special Considerations: ⇒ Monitor BP, HR and ECG ⇒ Use cautiously in liver disease, HF, respiratory depression and in older adults ⇒ Incidence of toxicity is increased if patient has HF or liver disease, has low lean body mass or is elderly or is concurrently taking Tagamet or a beta-blocker

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Magnesium		Replacement therapy: 1 gram/hour Adults: Severe asthma/Torsades: 2gm mixed with 16ml NS (total 20ml) slow IVP over 5 min (never more than 1GM/min) Preeclampsia/eclampsia: 2 gm mixed with 16ml NS slow IVP over 5 min. May repeat X 1 up to 4gm Peds: Severe asthma/Torsades: 25mg/kg (max 2 gm) mixed with NS to total volume of 20ml) slow IV over 10 – 20 minutes (asthma) faster for Torsades	Decreases acetylcholine in motor nerve terminals, which is responsible for anticonvulsant properties; Reduces SA node impulse formation, prolongs conduction time in the myocardium, aids in maintaining the active transport mechanism at the cellular level.	Replacement therapy for hypomagnesium states; Ventricular tachydysrhythmias (Torsade de Pointes); eclampsia as an anticonvulsant; as a tocolytic for preterm labor; bronchospasm refractory to frontline agents.	Heart block, renal disease, toxemia of pregnancy in patients when delivery is imminent (within 2 hours of delivery) Special Considerations: <ul style="list-style-type: none"> ⇒ Administer slowly and monitor vital signs and cardiac rhythm closely. ⇒ Be alert for orthostatic blood pressure changes. ⇒ If long-term administration is warranted, also monitor deep tendon reflexes.
Methylprednisolone (for spinal cord injury)	Solu-Medrol, Medrol	30mg/kg over 10 -20 min then 5.4/kg/hr	Intermediate-acting synthetic glucocorticoid used for its anti-inflammatory and immunosuppressive properties. Also alters the body's immune response to a variety of stimuli	. Once recommended as a treatment for acute spinal cord injury. More recent evidence has shown it to be ineffective and associated with multiple complications. Now it is only a treatment <i>option</i> for acute spinal cord injuries.	Psychosis, hypersensitivity, idiopathic thrombocytopenia, acute glomerulonephritis, fungal infections, non asthmatic bronchial disease. Child less than 2, AIDS, TB Special Considerations: <ul style="list-style-type: none"> ⇒ Monitor VS closely ⇒ Use with caution with Cushing's syndrome, GI ulcerations, diabetic patients and those with psychotic tendencies. ⇒ May cause hyperglycemia in the nondiabetic patient.

Generic Name	Trade Name	Approved Dose	Actions	Indications	Contraindications/Precautions Special Considerations
Morphine		PCA pump 30mg/4 hours	Depresses pain impulse transmission at the spinal cord level by interacting with opioid receptors. Has mild vasodilation properties to include decreasing preload and afterload thereby decreasing myocardial oxygen consumption	Moderate to severe pain, mild to moderate congestive heart failure, myocardial chest pain	<p>Known hypersensitivity, decreased level of consciousness, hypotension, increased intracranial pressure, respiratory depression, convulsive disorder, ingested poisoning, bronchial asthma</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Monitor BP, HR, respiratory rate and depth, urine output and patient evaluation of pain. ⇒ Use cautiously in liver disease, renal disease, head injury, respiratory depression ⇒ Maximal respiratory depression occurs within 7minutes after IV dose ⇒ Administer naloxone as indicated and prescribed for opiate overdose.
Nesiritide	Natrecor	IV infusion: 0.01mcg/kg/min for up to 48 hours; may be titrated up to 0.03mcg/kg/min	Binds to vascular receptor sites so as to cause vascular smooth muscle relaxation. The dilation of veins and arteries decreases preload and afterload. Inhibits rennin-angiotensin-aldosterone system and endothelin pathways, prompting the release of fluid and sodium from the body.	Decompensated heart failure in persons who have dyspnea at rest or with minimal activities and clinical evidence of fluid overload.	<p>Known hypersensitivity, shock, systolic BP less than 90 mm Hg, valvular stenosis, restrictive or obstructive cardiomyopathy, constrictive pericarditis, and cardiac tamponade</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Monitor HR, BP, urine output and neurologic status ⇒ Use caution when the patient is receiving other drugs that cause hypotension (e.g. ACE inhibitors) ⇒ Use cautiously with pregnant or actively lactating patients. ⇒ Nesiritide binds with heparin, so do not administer through any heparin-coated catheters ⇒ Do not administer through the same catheter as Heparin or Bumetanide ⇒

Generic Name	Trade Name	Approved Doses	Actions	Indications	Contraindications/Precautions Special Considerations
Nitroglycerin	Tridil	IV: 5 – 35 mcg/min (doses higher than 35mcg require RN to accompany) Sublingual: 0.4mg at 5 minute intervals to a maximum of three tablets (no limit when treating acute CHF)	Relaxes smooth muscles: 1. Dilates primarily venous system, decreasing preload 2. Dilates arterial system at higher doses, decreasing afterload 3. Relieves vasospasm 4. Redistributes blood flow in the heart, improving myocardial O ₂ consumption	Ischemic chest pain, acute MI, coronary artery spasm, acute left ventricular failure.	Known hypersensitivity, anemia, increased intracranial pressure, cerebral hemorrhage, hypertrophic cardiomyopathy, right ventricular infarction, ingestions of sildenafil (Viagra), vardenafil (Levitra), or tadalafil (Cialis) within 24 hours. Special Considerations: ⇒ Monitor HR, BP and urine output closely. When titrating monitor BP every 5 minutes. ⇒ Nitroglycerin is compatible with heparin if needed to run in the same line ⇒ Headache is usually dose related, treat with Tylenol.
Phosphorus rider		Replacement therapy: dependent on lab values. IV infusions need to be diluted and given over at least 4 – 6 hours	Action: • Aids in structure of cellular membrane • Essential for glucose metabolism in red blood cells • Regulates the delivery of oxygen to the tissues • Essential for high-energy phosphate formation • Helps with bone hardness • Aids in enzyme regulation • Used by kidney to buffer hydrogen ions.	Acute treatment of hypophosphatemia	Hyperphosphatemia, hyperkalemia, hypocalcemia, hypomagnesemia Special Considerations: ⇒ Requires continuous cardiac monitoring ⇒ May be incorporated into parental nutrition ⇒ Use with caution in patients with acid/base alterations; changes in serum potassium concentrations can occur during acid/base correction, monitor closely. ⇒ Use with caution in patients with cardiovascular disease (e.g., heart failure, cardiac arrhythmias); patients may be more susceptible to life-threatening cardiac effects associated with hyper/hypokalemia ⇒ Use with caution in patients with renal impairment

Generic Name	Trade Name	Approved Dose	Action	Indications	Contraindications/Precautions Special Considerations
<p>Potassium Chloride</p> <p>***Potassium should never be given as a direct push medication. It must always be diluted.</p>		<p>10meq/hr ***Potassium should never be given as a direct push medication.*** It must always be diluted.</p>	<ul style="list-style-type: none"> • 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 	<p>Treatment of hypokalemia</p> <p>Renal disease (severe), severe hemolytic disease, Addison's disease, hyperkalemia, acute dehydration, extensive tissue breakdown</p>	<p>Renal disease (severe), severe hemolytic disease, Addison's disease, hyperkalemia, acute dehydration, extensive tissue breakdown</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Requires continuous cardiac monitoring ⇒ IV infusions should be given through a large bore IV, with monitoring for extravasations ⇒ Infusions of greater than 10meq/hr require infusion through a central line. ⇒ Burning and discomfort at the site ⇒ ***Potassium must never be given as a direct push, it MUST always be diluted***

Generic Name	Trade Name	Approved Doses	Actions	Indications	Contraindications/Precautions Special Considerations
Tirofiban	Aggrastat	0.4mcg/kg/min for 30 minutes than 0.1mcg/kg/min Dosage is decreased in renal failure.	Binds with activated GPIIb/IIIa receptors, blocking the binding of fibrinogen, breaking apart existing thrombus.	In combination with heparin, is indicated for the treatment of acute coronary syndrome, including patients who are to be managed medically and those undergoing PTCA or atherectomy.	<p>Known hypersensitivity to any component of the product; active internal bleeding or a history of bleeding tendencies within the previous 30 days; a history of intracranial hemorrhage, brain tumor, arteriovenous malformation, or aneurysm; history of stroke within 30 days or any history of hemorrhagic stroke; major surgical procedure or severe physical trauma within the previous month; history, symptoms or findings suggestive of aortic dissection; severe hypertension (systolic blood pressure > 180 mmHg and/or diastolic blood pressure >110 mmHg); concomitant use of another parenteral GP IIb/IIIa inhibitor; acute pericarditis.</p> <p>Special Considerations:</p> <ul style="list-style-type: none"> ⇒ Use cautiously in patients who weigh less than 75kg, patients older than 65, patients with a history of GI disease, patients receiving thrombolytic and patients with thrombocytopenia. ⇒ Monitor oral secretions, sputum, vomitus, NG aspirate, stool and urine for blood ⇒ Limit venipunctures, avoid non compressible IV sites ⇒ Administer with aspirin and heparin as ordered