

Children's Hospital Medications Requiring Special Monitoring Guidelines

Intensive Care Units (Critical Care) – The definition of an intensive care unit at Our Lady of the Lake is one that has been designated as having the capability to care for patients that require the highest level of care and who may require mechanical ventilation. The difference between a progressive care unit and intensive care unit is the capability of administering titratable vasoactive medications along with continuous analgesia and sedation. These units have the capability of telemetry monitoring of all patients and maintain a sufficient nurse to patient ratio that allows for proper monitoring of these medications during and post-administration.

- NICU
- PICU
- PEDIATRIC EMERGENCY DEPARTMENT

Progressive Care Unit – The definition of a Progressive Care Unit at Our Lady of the Lake is one that has been designated as having the capability of telemetry monitoring of all patients, maintains a nursing staff competent to administer medications designated in this document, and has a sufficient nurse to patient ratio that allows for the proper monitoring of these medications post administration. A progressive care unit has the capability of providing care to patients receiving mechanical ventilation.

- Universal Care Unit

*Medications indicated in the PALS algorithm may be given on any unit during a Code Blue

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Adenosine Adenocard®	Rapid IV Push	Paroxysmal supraventricular tachycardia (PSVT)	Slows conduction time through AV node. May produce first, second, third degree heart block.	Critical Care Units Progressive Care Unit
Albuterol Ventolin®	Continuous nebulization	Status asthmaticus	Increased patient monitoring	Critical Care Units Progressive Care Unit
Alprostadil Prostin VR®	IV	Temporary maintenance of patency of ductus arteriosus in neonates with ductal dependent congenital heart disease until surgery can be performed	Increased patient monitoring.	Critical Care Units
Alteplase (TPA) Activase®	IV infusion Chest Tube	IV Infusion: Management of AMI, acute ischemic stroke, and acute pulmonary embolism Chest tube: assist with dissolving the fibrin component of loculated pleural effusions or pleural peel	Needs to be given where diagnostic & monitoring equipment are available due to risk of serious hemorrhage, including potentially fatal intracranial bleeding & internal bleeding.	Critical Care Units except for doses used for catheter clearance Chest tube: may be ordered on all units, but must be administered by a physician.
Amiodarone Cordarone	IV Bolus, followed by IV Infusion IVPB	Treatment of VF and VT (NOT to be used in Torsades de pointes) Tachyarrhythmia, including junctional ectopic tachycardia (JET) paroxysmal supraventricular tachycardia (PSVT)	Constant monitoring of cardiac rhythm & blood pressure important because of side effects including hypotension & cardiac arrhythmias.	Critical Care Units: Loading infusion given by IV bolus and maintenance IV infusion Progressive Care Unit: Maintenance IV infusions may be continued ONLY if the patient has been loaded in a Critical Care Unit or has been on PO amiodarone for more than a month.
Atracurium Tracrium®	IV Push IV Infusion	Adjunct to general anesthesia to facilitate endotracheal intubation and to relax skeletal muscle during surgery or mechanical ventilation.	A neuromuscular blocker which can severely compromise respiratory function and cause respiratory paralysis. Reactions may need to be managed by manual or mechanical ventilation	Critical Care Units
Atropine	IV Push (IM and SC routes do not require special monitoring)	Treatment of cardiac arrhythmias	Cardiovascular adverse reactions may occur such as arrhythmias and hypertension	Critical Care Units Progressive Care Unit

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Bumetanide Bumex®	IV Push IV Infusion	Treatment of volume overload	Close monitoring of urinary output is necessary to determine the effectiveness of the continuous infusion. Continuous infusions of bumetanide may significantly augment diuresis which can lead to over diuresis, hypokalemia, and hypomagnesemia. Close monitoring of volume status and electrolytes is necessary	IV Push: All units may administer IV Infusion limited to: Critical Care Units Progressive Care Unit
Calcium Chloride	IV Push IVPB (Central Line Preferred)	Hypocalcemic disorders Hyperkalemic ECG disturbances	Drug may precipitate arrhythmias.	Critical Care Units Progressive Care Unit
Calcium Gluconate	IV Push IVPB	Hypocalcemic disorders Hyperkalemic ECG disturbances	Drug may precipitate arrhythmias.	All units may administer. Should not be given in scalp vein, small hand, or foot veins.
Captopril	PO	Treatment of hypertension and heart failure	Hypotension may occur during therapy initiation in pediatric patients	Established therapy: all units may administer Induction therapy limited to: Critical Care Units Progressive Care Unit
Cisatracurium Nimbex®	IV Push IV infusion	Adjunct to general anesthesia to facilitate endotracheal intubation and to relax skeletal muscle during surgery or mechanical ventilation.	A neuromuscular blocker which can severely compromise respiratory function and cause respiratory paralysis. Reactions may need to be managed by manual or mechanical ventilation.	Critical Care Units
Dexmedetomidine Precedex®	IV infusion	Sedation of initially intubated patients during treatment in intensive care units.	Hypotension and bradycardia have been associated with patients with high vagal tone or rapid infusions of dexmedetomidine	Critical Care Units
Dextrose 50	IV	Hypoglycemia	Should not be administered to the pediatric patient unless other options are not available; D25 or D10 should be administered	All units may administer
Digoxin Lanoxin®	IV Push	Treatment of heart failure, atrial fibrillation; supraventricular tachycardias	Monitoring of heart rate and rhythm important because of side effects including cardiac arrhythmias and heart block	Critical Care Units Progressive Care Unit

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Diphenhydramine Benadryl®	IV	Treatment of allergic reactions caused by histamine release Adjunct to epinephrine in anaphylaxis Pretreatment for medications with increased risk of allergic reaction	Rapid IV administration may precipitate seizures in pediatric patients. Rapid IV administration has also been linked to euphoria which may promote drug seeking behaviors	All units may administer IV doses should be administered via pump over 10 to 15 minutes unless for acute allergic reaction.
Dobutamine Dobutrex®	IV infusion (Central Line)	Increase cardiac contractility for treatment of cardiac decompensation	Continuous monitoring in ECG and blood pressure important. A marked increase in heart rate or blood pressure & precipitation of ventricular ectopic activity may occur.	Critical Care Units Progressive Care Unit
Dopamine Intropin®	IV infusion (Central Line)	Increase cardiac contractility Increase organ perfusion Increase urine output in the treatment of shock syndrome & chronic cardiac decompensation	Must monitor urine flow, cardiac output & blood pressure during infusion due to its alpha, beta and dopaminergic effects. Infuse into large vein to prevent extravasation	Critical Care Units Progressive Care Unit
Epinephrine Adrenaline®	IV infusion (Central Line) IV Push (IM & SC do not require monitoring)	Treatment of ventricular stand still Treatment of cardiac arrest and AV block	Monitoring important because of cardiovascular effects including increase in high blood pressure, aortic rupture, serious cardiac arrhythmias, cerebrovascular hemorrhage, & pulmonary edema necessitate extreme caution.	Critical Care Units
Esmolol Brevibloc®	IV Infusion (Central Line Preferred)	For rapid control of supraventricular tachycardia	Monitoring heart rate necessary during titration	Critical Care Units
Etomidate Amidate®	IV Push	Induction and maintenance of general anesthesia	Monitoring of cardiac function and blood pressure necessary	Critical Care Units
Fenoldopam Corlopan®	IV Infusion	Hypertensive emergency	Monitor blood pressure (hypotension) and heart rate (tachycardia). May cause hypokalemia. Monitor serum potassium.	Critical Care Units Progressive Care Unit may administer fixed doses of 0.1 mcg/kg/min or less (no titration).

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Fentanyl Sublimaze®	IM Slow IV Push IV Infusion Intranasal Epidural	For analgesic action of short duration during anesthesia as needed; for use as a narcotic analgesic supplement in general or regional anesthesia; for administration as a neuroleptic as an induction of anesthesia; for use as an anesthetic agent with oxygen in selected high risk patients	Vital signs must be routinely monitored.	Critical Care Units Progressive Care Unit Pediatric Sedation Comfort Care Patients (any location, no monitoring required) All units may administer intranasally & via epidural
Furosemide Lasix®	IV Push IV Infusion	Treatment of volume overload	Close monitoring of urinary output is necessary to determine the effectiveness of the continuous infusion. Continuous infusions of furosemide may significantly augment diuresis which can lead to over diuresis, hypokalemia, and hypomagnesemia. Close monitoring of volume status and electrolytes is necessary.	IV Push: all units may administer IV Infusion limited to: Critical Care Units Progressive Care Unit
Haloperidol Haldol®	IV Push IM	Emergency sedation of severely agitated or delirious patients	Higher doses and intravenous administration of haloperidol appear to be associated with a higher risk of QT prolongation and EKG monitoring is required when given IV. It is not acceptable to be administered for the indication of nausea	IM: all units may administer IVPush limited to: Critical Care Units Progressive Care Unit
Heparin Drip	IV Infusion	Antithrombotic Therapy	For patients, outside of PICU, recommend placement on Progressive Care Unit to accommodate increase monitoring and adjustment of continuous infusions. All rate changes must be verified with second RN. Children's Hospital Pediatric Treatment of Confirmed DVT/VTE/PE Order set should be used.	Recommended in Critical Care Units or Progressive Care Units

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Hydralazine Apresoline®	IV Push	Hypertensive emergency/urgency and management of moderate to severe hypertension	Blood pressure response may be unpredictable in some patients Blood pressure monitoring required after administration	All units may administer
Insulin Drip	IV Infusion	Treatment of Hyperglycemia	Requires hourly monitoring of blood glucose	Critical Care Units
Isoproterenol Isuprel®	IV Infusion	Management of shock & cardiac arrest Increase cardiac contractility & rate to increase cardiac output	Produces cardiac effects (tachycardia, seizures, pulmonary edema) which may aggravate existing cardiac problems. ECG monitoring is necessary	Critical Care Units
Ketamine Ketalar®	IV Push IV Infusion IM PO	Sole anesthetic for short surgical procedures; Bronchodilation. Dissociative anesthetic; induction and maintenance of anesthesia, especially in hypovolemic or high-risk patients.	Cardiovascular hypertension, tachycardia, arrhythmias, bradycardia. Pulmonary: depression, apnea, laryngospasm. CNS: tonic, clonic movement, emergence delirium. GI: nausea, vomiting, hypersalivation. Eye: Diplopia, nystagmus, slight elevation in intraocular tension	Critical Care Units Pediatric Sedation
Labetolol Trandate®	IV Push	For control of blood pressure in severe hypertension.	IV push requires frequent hemodynamic monitoring.	Critical Care Units Progressive Care Unit
Lidocaine Xylocaine®	Slow continuous infusion IV Push	Treatment cardiac arrhythmias	Slow continuous infusion with controlled administration device. ECG and vital signs routinely monitored	Critical Care Units Progressive Care Unit- no titrations allowed
Lorazepam Ativan®	IV Infusion	Continuous sedation to intubated, mechanically ventilated adult patients to provide continuous sedation and control of stress responses	Requires monitoring of cardiovascular status, blood pressure, and heart rate. Patient must also be mechanically ventilated	Critical Care Units
Mannitol Osmitol®	IVPB	Hemodynamic support for intradialytic hypotension Treatment of increased intracranial pressure and cerebral edema	Requiring monitoring of cardiovascular status, intracranial pressure, serum osmolality.	Critical Care Units

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Midazolam Versed®	IV Push IV Infusion IM Intranasal	For conscious sedation prior to general anesthesia, before administration of other anesthetic agents; to supplement nitrous oxide and oxygen for short surgical procedures.	Midazolam IV has been associated with respiratory arrest especially when used for conscious sedation. Requires continuous monitoring of respiratory and cardiac function for IV administration.	Critical Care Units Progressive Care Unit Pediatric Sedation All units may administer intranasally & IM
Milrinone Primacor®	IV bolus, followed by IV infusion	Increase heart contractility Treatment of CHF when digitalis is not effective. Congestive heart failure	Monitor heart rate, blood pressure, fluids and electrolytes. Do not admix with furosemide	Critical Care Units Progressive Care Unit -No titrations allowed
Nicardipine Cardene IV®	IV Infusion (Large peripheral vein)	Short-term treatment of hypertension	Caution & monitoring because of hypotension, tachycardia, and changes in afterload	Critical Care Units
Nitroglycerin Tridil®	IV Infusion	CHF Angina Hypertension crisis	Monitor for hypotension, tachycardia, palpitations, syncope & collapse. Dosage dependent on patient response; monitoring is necessary.	Critical Care Units
Nitroprusside Nipride®	IV Infusion	Hypertensive crisis	A potent hypotensive drug which can cause profound hypertension, loss of consciousness. Causes cyanide toxicity. Monitor blood pressure & renal function & output; cyanide levels to regulate dosage & effects	Critical Care Units
Norepinephrine Levophed®	IV Infusion (Central Line)	Restoration of blood pressure in controlling certain acute hypotensive states & adjunct in treatment of cardiac arrest and profound hypotension	A powerful peripheral vasoconstrictor and potent inotropic stimulation of the heart. Central venous pressure monitoring may be necessary during dosing titration.	Critical Care Units
Pancuronium Pavulon®	IV Push	Adjunct to anesthesia to induce skeletal muscle relaxation	Neuromuscular blocker which may cause respiratory insufficiency or apnea. Reactions may need to be managed by manual or mechanical ventilation	Critical Care Units
Pentobarbital	IV Push IV Infusion	Refractory status epilepticus; barbiturate coma in patients with severe brain injury and increased ICP	May cause hypotension and respiratory depression when administered IV Potential delayed metabolism or elimination in infants <6 months of age	Critical Care Units

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Phenylephrine Neosynephrine®	IV Bolus IV infusion (Central Line)	Hypotension/Shock	Potent, direct-acting alpha-adrenergic stimulator with beta-adrenergic activity that produces systemic arterial vasoconstriction that requires close monitoring of blood pressure and pulse	Critical Care Units
Potassium Chloride	IV Infusion	Hypokalemia	Can cause arrhythmias if infused too rapidly.	All units may administer Cardiac monitoring needed if infusion rate is greater than 0.5mEq/kg/hr
Procainamide	IV Infusion	Ventricular arrhythmias	Potentially fatal blood dyscrasias (agranulocytosis) and proarrhythmic effects Continued administration leads to development of positive ANA test in 50% of patients, which may result in drug-induced lupus erythematosus-like syndrome ECG and continuous vital signs routinely monitored	Critical Care Units
Propofol Diprivan®	IV Push IV Infusion	Continuous sedation to intubated, mechanically ventilated adult patients to provide continuous sedation and control of stress responses. Also, used for cardioversion and other special procedures.	Significant hypotension and bradycardia.	Critical Care Units Progressive Care Unit (IV Push only and only if administered by physician) Pediatric Sedation
Propranolol Inderal®	IV Push IV infusion	Life threatening arrhythmias or those occurring under anesthesia	Central venous pressure and ECG monitoring required. Injection should not exceed 1mg/min to avoid lowering blood pressure and causing cardiac standstill.	Critical Care Units Progressive Care Unit
Rocuronium Zemuron®	IV Push IV Infusion	Adjunct to general anesthesia; to facilitate endotracheal intubation; skeletal muscle relaxation during surgery or mechanical ventilation.	Respiratory depression or apnea may occur. Manual or mechanical ventilation may be necessary to manage the patient.	Critical Care Units

Generic Drug Name (Trade Name)	Route of Administration	Major Indication	Reason for Restrictions	Areas Where Administration is Permitted
Sodium Chloride Hypertonic Saline	IV infusion	Hyponatremia Elevated intracranial pressure due to various etiologies (e.g. traumatic brain injury, intracranial hemorrhage, transtentorial herniation)	Risk of central pontine myelinolysis (due to rapid correction of hyponatremia), frequent monitoring of serum sodium and osmolality, hemolysis, transient hypotension (especially with 23.4%).	Critical Care Units Progressive Care Unit >3% NaCl: Critical Care Units only
Succinylcholine Anectine® Quelicin®	IM IV Push	Adjunct to general anesthesia Induce skeletal muscle relaxation or paralysis during surgery	A neuromuscular blocker which produces muscular paralysis resulting in respiratory depression or apnea. Malignant hyperthermic crisis and cardiac effects (hypotension, asystole) may also occur.	Critical Care Units Progressive Care Unit
Terbutaline	IV infusion	Bronchodilator for relief of reversible bronchospasm in patients with asthma, bronchitis, and emphysema	IV Terbutaline needs to be monitored due to the possibility of hypertension, tachycardia, and arrhythmia.	Critical Care Units
Vasopressin	IV infusion (Central Line) IM SC	Vasodilatory Shock/septic shock	Circumoral pallor (with high doses), hypertension, bradycardia, arrhythmias, venous thrombosis, vasoconstriction, distal limb ischemia, requires an increased level of monitoring	IV Infusion: Critical Care Units IM & SC: All units may administer
Vecuronium Norcuron®	IV Push IV Infusion.	Adjunct to general anesthesia; to facilitate endotracheal intubation; skeletal muscle relaxation during surgery or mechanical ventilation	Respiratory depression or apnea may occur. Manual or mechanical ventilation may be necessary to manage the patient.	Critical Care Units
Verapamil Calan®, Isoptin®	Slow IV Push	Temporary control of rapid ventricular rate in atrial flutter or atrial fibrillation. Supraventricular arrhythmias	Due to some patients experiencing life-threatening adverse reactions (hypotension, asystole), the use of IV Verapamil needs to be monitored.	Critical Care Units Progressive Care Unit

* Central line administration restrictions are based on pH (less than 5 or greater than 9), osmolarity (greater than 500 mOsm/L), and extravasation potential