

## Erlanger Health System IV Medication Administration Guideline

Cardiac/Vasoactive Medications									
Medication	Concentration	Initial Rate of Infusion (Unless specified by MD )	Titration Rate (Increase/decrease)	Typical dosage range	Soft Limit	Hard Limit	Goal/Desired response	Call MD if Below Parameters Not Achieved at Soft Limit	Monitoring
Amiodarone (mg/min)	Bolus:150mg/100ml 450mg/250ml (1.8mg/ml)	Bolus:150mg IV over 10 min Infusion: 1mg/min for 6hr then 0.5mg/min	No titration	0.5-1 mg/min		1 mg/min	Converting arrhythmia		HR(arrhythmia, PLTs, bleeding), Hypotension
Diltiazem (mg/hr)	100mg/100ml (1mg/ml)	Load: 0.25mg/kg IV push over 2 minutes Infusion: 5mg/hr	Titrate by 2.5mg/hr every 15 minutes	1 to 15mg/hr	15mg/hr	20mg/hr	MAP >= 65mmHG, HR<120bpm; SBP>90mmHg or as ordered by MD	If pulse or blood pressure out of target at max dose	HR, arrhythmia and BP
DoBUTamine (mcg/kg/min)	500mg/250ml (2mg/ml)	Start at 2.5mcg/kg/min	Titrate by 2.5mcg/kg/min q15 min to reach goal	2 to 20mcg/kg/min	20mcg/kg/min	40mcg/kg/min	Goal cardiac index>2.5 and/orSvO2≥70 AND/OR as ordered by MD	If CI or SvO2 not achieved, HR>125 or ventricular tachyarrhythmias	HR, BP, arrhythmia, myocardial ischemia, CO, chest pain
DOPamine (mcg/kg/min)	400mg/250ml (1,600mcg/ml) 800mg/250ml (3,200mcg/ml)	Initial rate: 5mcg/kg/min	Titrate by 5mcg/kg/min q10min to reach goal	2 to 20mcg/kg/min	20 mcg/kg/min	30mcg/kg/min	MAP ≥ 65mmHg; SBP>90, HR<125bpm or as ordered by MD	If MAP not achieved at max. dose; HR>125 or ventricular tachyarrhythmia	HR, BP, arrhythmia,
Esmolol (mcg/kg/min)	2500mg/250ml (10mg/ml)	Load:500mcg/kg over 1min Infusion:50mcg/kg/min	Titrate by 50mcg/kg/min q5min to reach goal	50 to 200mcg/kg/min	200mcg/kg/min	300mcg/kg/min	Tachycardia/hypertension: Goal HR/BP to be specified by MD	Pulse or blood pressure out of target at max dose	HR, BP, arrhythmia, CHH, bronchospasm
EPInephrine (mcg/kg/min)	4mg/250ml (16mcg/ml) 8mg/250ml (32mcg/ml)	0.05-0.1 mcg/kg/min	Titrate 0.1 mcg/kg/min q5min to reach goal	0.05-0.5 mcg/kg/min	0.5 mcg/kg/min	1 mcg/kg/min	MAP > 65mmHG, SBP>90; HR≤125bpm or as specified by MD	If dose > 0.5 mcg/kg/min and goal of MAP not achieved; HR>125 or ventricular tachyarrhythmias	HR, BP, arrhythmia, myocardial ischemia, pulmonary edema, Central line preferred
Isoproterenol (mcg/min)	1mg/250ml (4 mcg/mL)	1mcg/min	Titrate by 1mcg/min Q15min	2 to 10mcg/min	20mcg/min	30mcg/min	Goal of HR/BP to be specified by MD		Increasing HR, arrhythmias, BP, HA, Pulmonary edema
Labetalol (mg/min)	300mg/300ml (1mg/1ml) 500mg/250mL (2mg/mL)	Load: 5 to 20 mg IV push Infusion: 1mg/min	Titrate by 0.5mg/min q10min to reach goal	1 to 4mg/min	4mg/min =240mg/hr	8mg/min	Goal HR/BP to be specified by MD	Pulse or blood pressure out of target at max dose	HR, BP
Lidocaine (mg/min)	2000mg/500ml (4mg/ml)	Load: 1 mg/kg (max 100mg) Infusion: 2mg/min Ventricular Arrhythmia	Titrate per MD order Only	1 to 4mg/min		4mg/min	Converting arrhythmia	If goal not reach at max. dose.	EKG, BP, HR, Monitor drug levels for infusion >24hrs (therapeutic range 1.5-5 mcg/mL)
Milrinone (mcg/kg/min)	20mg/100ml (0.2mg/ml)	Acute CHF loading: (optional) 50mcg/kg over 10min Initial rate: 0.25mcg/kg/min <b>**Consider lower initial rate in pts with renal failure**</b>	Increase by 0.005 mcg/kg/min every 10 min PER MD ORDER ONLY	0.375 to 0.75mcg/kg/min		0.75mcg/kg/min	Per MD order	If goal not achieved at max. dose	CVP, BP, HR, Renal function, LFT, CBC, platelet
Nicardipine (mg/hr)	40mg/200ml or 50mg/250ml (0.2mg/ml)	No bolus Infusion: 5mg/hr	Titrate by 2.5mg/hr every 15 min to reach goal	5 to 15mg/hr		15mg/hr	Hypertension: goal of blood pressure specified by MD	Goal of blood pressure not achieved at max dose	BP, HA, Flushing
Nitroglycerin (mcg/min)	50mg/250ml (200mcg/ml)	5 to 10 mcg/min	Titrate by 5mcg/min every 5min to reach	5 to 200mcg/min	200mcg/min	400mcg/min	Reduction of chest pain and SBP>100	Chest pain not relieved or hypotension (SBP<100)	BP, HR, Flushing, tolerance may develop if continue>24h
Nitroprusside (Nipride) (mcg/kg/min)	50mg/250mg (200 mcg/mL)	0.3mcg/kg/min	0.3mcg/kg/min q5 min to reach goal	0.2 to 3mcg/kg/min	3mcg/kg/min	10mcg/kg/min	Reduction of hypertension per MD specified. Order cyanide level on day 3 if infusion >48 or rate>2mcg/kg/min	If dose >2mcg/kg/min and blood pressure not achieved	BP, HR, CO, renal function, hepatic function, Cyanide, thiocyanate or methemoglobin level
Norepinephrine (Levophed) (mcg/kg/min)	4mg/250ml (16mcg/ml) 16mg/250ml (64mcg/ml)	Initial rate: 0.05-0.1 mcg/kg/min	Titrate by 0.1 mcg/kg/min q5min to reach goal	0.05-0.5 mcg/kg/min	0.5 mcg/kg/min	1 mcg/kg/min	Hypotension: MAP≥65mmHg, BP.>90 and HR<125 bpm or as specify by MD	If dose >0.5 mcg/kg/min and blood pressure not achieved Digital ischemia	HR, BP, arrhythmia, CO, Central line prefer to avoid extravasation
Phenylephrine (Neo-synephrine) (mcg/kg/min)	50mg/250ml (0.2mg/ml) 100mg/250ml (0.4mg/ml)	Initial rate: 0.5 mcg/kg/min	Titrate by 0.2 mcg/kg/min q2min to reach goal	0.5-2 mcg/kg/min	2 mcg/kg/min	3 mcg/kg/min	Hypotension: MAP≥65mmHg or as ordered by MD	If dose >2 mcg/kg/min and blood pressure not achieved Digital ischemia	HR, BP, arrhythmia, central line preferred to avoid extravasation
Procainamide (mg/min)	2000mg/500ml (4mg/ml)	Initial Rate: 1mg/min	Titrate by 1mg/min every 15 min per parameter ordered by MD	1 to 4mg/min	4mg/min	6mg/min	Converting arrhythmia	If goal not achieved at max. dose.	ECG, BP, HR, renal function, CBC, NAPA for prolonged infusion.
Vasopressin (unit/min)	50units/250ml (0.2units/ml)	0.04 unit/min	<b>Do Not Titrate UP</b>	0.04unit/min	0.04units/min	0.06unit/min	MAP≥65, SBP>90, HR<125bpm or as specify by MD	Blood pressure not achieved at max dose	BP, HR, Central line prefer

**\*\*Physician (non-midlevel provider) order required to titrate above soft limit\*\***

Paralytics									
Medication	Concentration	Initial Rate of Infusion (Unless specified by MD)	Titration Rate (Increase/decrease)	Typical dosage range	Soft Limit	Hard Limit	Goal/Desired response	Call MD if Below Parameters Not Achieved at Soft Limit	Monitoring
Atracurium (mcg/kg/min)	1000mg/100ml (10mg/ml)	Load: 0.4mg/kg Infusion: 5mcg/kg/min	Titrate by 1mcg/kg/min q15min	5 to 9mcg/kg/min	10mcg/kg/min	15mcg/kg/min	Neuromuscular blockade to achieve 2 twitches on train of 4	Train of 4 not achieved at maximum dose	HR, BP, and Train of 4
Cisatracurium (mcg/kg/min)	100mg//100ml (1mg/ml)	Load: 100 to 200mcg/kg Infusion: 2mcg/kg/min	Titrate by 1mcg/kg /min Q15min	1 to 10mcg/kg/min		10mcg/kg/min	Neuromuscular blockade to achieve 2 twitches on train of 4	Train of 4 not achieved at maximum dose	HR, BP, and Train of 4
Rocuronium (mcg/kg/min)	500mg/100ml (5mg/ml)	Load: 0.6mg/kg Infusion: 4mcg/kg/min	Titrate by 1 mcg/kg/min q15 min	8 to 12mcg/kg/min	12mcg/kg/min	16mcg/kg/min	Neuromuscular blockade to achieved 2 twitches on train of 4	Train of 4 not achieved at maximum dose	HR, BP, and Train of 4
Vecuronium (mcg/kg/min)	100mg/100ml (1mg/ml)	Load: 0.1mg/kg IV push Infusion: 1mcg/kg/min	Titrate by 0.2mcg/kg/min q15 min	0.8 to 1.2 mcg/kg/min	1.2 mcg/kg/min	1.7mcg/kg/min	Neuromuscular blockade to achieve 2 twitches on train of 4 or as ordered by MD	Train of 4 not achieved at max dose	Train of 4, renal function, liver function
Pain/Sedation Medications									
Medication	Concentration	Initial Rate of Infusion (Unless specified by MD)	Titration Rate (Increase/decrease)	Typical dosage range	Soft Limit	Hard Limit	Goal/Desired response	Call MD if Below Parameters Not Achieved at Soft Limit	Monitoring
Dexmedetomidine (mcg/kg/hr)	400mcg/100ml or 1000 mcg/250 mL (4mcg/ml)	Infusion:0.2mcg/kg/hr	Titrate by 0.2mcg/kg/hr 30 min	0.2 to 0.7mcg/kg/hr	---	1mcg/kg/hr	RASS 0 to -2 or specified by MD	If pain or sedation not achieved at max dose-1mcg/kg/hr	BP, HR, RR, pain level. Sedation scale
Fentanyl (mcg/hr)	1000mcg/100ml (10mcg/ml) 2000mcg/100ml (20mcg/ml)	50 mcg/hr	Titrate by 25 to 50mcg/hr every 15 min to reach goal	25 to 200mcg/hr	200mcg/hr	400mcg/hr	RASS 0 to -2 or specified by MD	Target pain uncontrolled or sedation not achieved at dose>200mcg/min	BP, RR, Pain scale
Hydromorphone (mg/hr)	20mg/50ml (0.4mg/ml)	Infusion: 0.2mg/hr	Titrate by 0.2mg/hr q30min	0.2mg to 3mg/hr	3mg/hr	10mg/hr	RASS 0 to -2 or specified by MD	Target pain uncontrolled or sedation not achieved at 3mcg/hr	BP, RR, Pain scale
Ketamine (mg/kg/hr)	500mg/500ml (1mg/ml) 1000mg/500ml (2mg/ml)	Intubated infusion: 0.25mg/kg/hr Non intubated infusion 0.05mg/kg/hr	Intubated titration 0.25mg/kg/hr every hour Non intubated titration 0.05mg/kg/hr every hour	Intubated 0.25-2mg/kg/hr Non intubated 0.05-0.5mg/kg/hr		2mg/kg/hr	RASS 0 to -2 or specified by MD	Target pain uncontrolled or sedation not achieved at max dose	BP, RR, Pain score
Lorazepam (mg/hr)	40mg/200ml (0.2mg/ml)	Load: 1 to 2mg IV over 2min Initial rate: 0.5mg/hr	Titrate by 0.5mg/hr every 30min to reach goal	0.5 to 4mg/hr	6mg/hr	10mg/hr	RASS 0 to -2 or specified by MD	If target sedation not achieved at dose >4mg/hr	BP, HR, RR, acidosis
Midazolam (mg/hr)	50mg/250ml (0.2mg/ml) 100mg/250ml (0.4mg/ml)	Load: 1 to 2mg IV over 2min Infusion: 1 to 2mg/hr	Titrate by 1mg /hr q10min to reach goal	1 to 5mg/hr	5mg/hr	15mg/hr	RASS 0 to -2 or specified by MD	If target sedation not achieved at dose >5mg/hr	BP, HR, RR,
Morphine (mg/hr)	100mg/100ml (1mg/ml)	Load: 2mg IV over 1min Initial rate: 0.5 to 1mg/hr	Titrate 0.5mg/hr q30min to reach goal	1 to 5mg/hr	10mg/hr	20mg/hr	RASS 0 to -2 or specified by MD	If pain or sedation not achieved at dose>4mg/hr	BP, HR, Pain scale
Propofol (mcg/kg/min)	1000mg/100ml 10mg/ml	Infusion: 5mcg/kg/min	Titrate 5mcg/kg/min q5min	5 to 50mcg/kg/min	50mcg/kg/min	67mcg/kg/min	RASS 0 to -2 or specified by MD	If sedation not achieved at max dose or hypotension (SBP<100)	BP, sedation scale, triglyceride level, CPK, and lactate

**\*\*Physician (non-midlevel provider) order required to titrate above soft limit\*\***