

Our Lady of the Lake Pharmacy & Therapeutics (P&T) Committee
Critical IV Infusion Guidelines (August 2019)

Clinical issue:

- JCAHO requires medication orders to be clear and accurate. The hospital is required to have a written policy defining the requirements of a complete medication order. (MM 04.01.01)
- Titration orders without titration and monitoring parameters are incomplete orders.
- Pharmacists and nurses must contact prescribers to clarify orders whenever clear parameters are not ordered.

Plan:

- Ensure all titratable medications have an initial rate, titration rate, frequency, and goal
- Whenever necessary, ensure orders indicate max rates and any other pertinent clinical information
- Ensure this information is added to the order comments of all titratable medications.
- Providers may adjust the parameters to meet the needs of their patients, these parameters will be used for default

| DRUG (BRAND NAME) | DOSING, TITRATION AND MONITORING |
|-----------------------------------|--|
| AMIODARONE (CORDARONE) | Start at 1mg/min times 6 hours; then decrease to 0.5mg/min. Maximum cumulative dose of 2.1 grams in 24 hours. Loading infusion and Maintenance in Critical Care Units -- Maintenance infusion in Monitored Units and Progressive Care Units only --- |
| ATRACURIUM (TRACRIUM) | Loading dose of 0.5mg/kg. Start continuous infusion at 5mcg/kg/min; may titrate by 5mcg/kg/min every 15 minutes up to a maximum of 15mcg/kg/min to maintain 1 to 2 twitches on a train of 4. Titrate sedation to maintain BIS < 50. ***Critical Care Units Only *** |
| CISATRACURIUM (NIMBEX) | ICU Paralysis: Loading dose of 0.2mg/kg IV bolus. Then start at 3mcg/kg/min; titrate by 0.5mcg/kg/min every 30 minutes to maintain 1 to 2 twitches on a train of 4. Titrate sedation to maintain BIS < 50. Do not exceed 10 mcg/kg/min***Critical Care Units Only ARDSnet Protocol Paralysis: 15mg loading dose followed by 37.5mg/hr x 48 hours (not titratable) Titrate sedation to maintain BIS < 50. ***Critical Care Units Only *** |
| CLEVIDIPINE (CLEVIPREX) | Initiate at 1mg/hr, titrate by doubling dose every 3 min to maintain SBP less than *** mmHg; Maximum dose is 21mg/hr. **Critical Care Units Only** |
| DEXMEDETOMIDINE (PRECEDEX) | Optional bolus 1mcg/kg over 25 minutes; start infusion at 0.2mcg/kg/hr and then titrate by 0.2mcg/kg/hr every 30 minutes for sedation (RASS 0 to -1), pain and anxiety up to a max rate of 1.5mcg/kg/hr Hold loading dose in patients with marginal hypotension (SBP<100), bradycardia (HR<60), greater than 70 years of age, or EF<25%. Discontinue drip and notify MD if symptomatic/acute hypotension or bradycardia occurs. ***Critical Care Units Only *** |
| DILTIAZEM (CARDIZEM) | Start at 5mg/hr; increase by 5mg/hr every 15 minutes to a desired target HR below 110. Maximum dose is 15mg/hr. *May be titrated in Critical Care and Progressive Care Units Only * **Cardiac Telemetry Units must use fixed rate, no titrations** |
| DOBUTAMINE (DOBUTREX) | Start at 2.5 mcg/kg/min; then titrate by 2.5mcg/kg/min every 10 minutes up to a maximum dose of 20mcg/kg/min to achieve a SBP>90. Call MD for cardiac arrhythmias. ***May be titrated in Critical Care Units only*** Progressive Care Units and Monitored Units must be fixed rate, no titrations*** |
| DOPAMINE | Start at 5mcg/kg/min; may titrate by 5mcg/kg/min every 10 minutes up to a maximum of 20mcg/kg/min to maintain MAP of 65 or above. *** May be titrated in Critical Care Units only*** Progressive Care Units and Monitored Units must be at fixed and rate should not exceed 5mcg/kg/min, No Titrations*** |

| | |
|--------------------------------------|---|
| EPINEPHRINE (ADRENALIN) | <p>Start at 0.02 mcg/kg/min. Adjust by 0.01 mcg/kg/min every 5 minutes up to a maximum of 1 mcg/kg/min to maintain MAP of 65 mmHg or greater. Contact physician for titration above 1 mcg/kg/min.. **** Critical Care Units Only ***</p> |
| EPTIFIBATIDE (INTEGRILIN) | <p>Acute Coronary Syndrome: Bolus 180mcg/kg (maximum 22.6mg) over 2 minutes followed by continuous infusion of 2mcg/kg/min (maximum 15 mg/hr) until hospital discharge or initiation of CABG surgery up to 72 hours.</p> <p>Percutaneous Coronary Intervention (PCI): Loading dose 180mcg/kg over 2 minutes, then repeat in 10 minutes. (Max loading dose of 22.6mg) Initial rate 2 mcg/kg/min. Bolus, start infusion, and re-bolus 10 minutes after the initial bolus. Reduce infusion to 1mcg/kg/min for CrCl <50ml/min. Max duration 72 hours. Do not exceed 15 mg/hr.</p> <p>Non-PCI: Loading dose 180mcg/kg over 2 minutes (Max loading dose of 22.6mg) Initial rate 2 mcg/kg/min. Reduce infusion to 1mcg/kg/min for CrCl <50ml/min. Max duration 72 hours. Do not exceed 15 mg/hr. For patients with eCrCl < 50 ml/min: reduce rate of continuous infusion to 1 mcg/kg/min (maximum 7.5 mg/hr)</p> |
| ESMOLOL (BREVIBLOC) | <p>Loading dose of 0.5mg/kg over 1 minute, then start infusion at 50mcg/kg/min; increase by 50mcg/kg/min every 5 minutes to a target HR of ___ or systolic blood pressure of __. Max dose 300mcg/kg/min. ***Critical Care Units Only ***</p> |
| FENTANYL | <p>Continuous infusion—Start at 25 mcg/hr; increase by 25mcg/hr every 15 minutes for target RASS of 0 to -1. Maximum dose of 200mcg/hr without physician override. ***Critical Care Units Only ***</p> |
| FENOLDOPAM (CORLOPAM) | <p>Initial 0.05mcg/kg/min, increase by 0.05mcg/kg/minute every 15 minutes until SBP less than 160 mmHg. Maximum dose 1.6 mcg/kg/minute. *May be titrated in Critical Care Units only* **Progressive Care and Cardiac Telemetry Units must use fixed rate of 0.1 mcg/kg/min or less, no titrations**</p> |
| ISOPROTERENOL (ISUPREL) | <p>Initiate at 2 mcg/min, increase by 2 mcg/min every 5 minutes to achieve a target heart rate of *** Do not exceed 20 mcg/min.</p> |
| KETAMINE (KETALAR) | <p>Initiate continuous infusion at 0.05 mg/kg/hr. Increase by 0.1mg/kg/hr every 15 minutes up to 2.5mg/kg/hr to achieve a target RASS of 0 to -1 in mechanically ventilated patients***Critical Care Units Only***</p> |
| LABETALOL (TRANDATE) | <p>Start at 2mg/min; increase by 1mg/min every 10 minutes achieve target systolic blood pressure less than ***mmHg. Maximum dose is 6mg/min.***Critical Care Units Only ***</p> |
| LIDOCAINE | <p>Loading dose of 1 mg/kg over 5 minutes. If refractory VF or pulseless VT, repeat 0.5 to 0.75 mg/kg bolus every 5 to 10 minutes (maximum cumulative dose: 3 mg/kg). Follow with continuous infusion at 1 mg/min after return of perfusion. Reappearance of arrhythmia during constant infusion give 0.5 mg/kg bolus and reassessment of infusion with increase in rate by 1mg/min increments with maximum dose of 4 mg/min.</p> |
| LORAZEPAM (ATIVAN) | <p>Loading dose 2mg. Then start IV infusion at 2mg/hr; titrate by 1mg/hr every 30 minutes up to a maximum of 10mg/hr to achieve desired level of sedation of 0 to -2 on RASS ; ***Critical Care Units Only***</p> |

| | |
|--------------------------------------|---|
| MIDAZOLAM (VERSED) | Initial 0.05mg/kg followed by maintenance infusion started at 0.02mg/kg/hr titrated by 0.02mg/kg/hr every 10 minutes to desired level of sedation of 0 to -1 on RASS. Max rate 0.25mg/kg/hr *** Critical Care Units Only*** |
| MILRINONE (PRIMACOR) | May begin maintenance infusion at 0.375mcg/kg/min; titrate by 0.005mcg/kg/min every 5 minutes up to a maximum dose of 0.75mcg/kg/min to achieve the desired hemodynamic and clinical response (improvement in the clinical signs and symptoms of CHF); Call MD for cardiac arrhythmia. ***May be titrated in Critical Care and Progressive Care Units only*** Cardiac Telemetry Units must use fixed rate, no titrations*** |
| NICARDIPINE (CARDENE) | Start at 5mg/hr; increase by 2.5mg/hr every 15 minutes to maintain a SBP of less than ***mmHg; Maximum dose is 15mg/hr. ***Critical Care Units Only *** |
| NITROPRUSSIDE (NIPRIDE) | Start at 0.5mcg/kg/min; may titrate by 0.5mcg/kg/min every 5 minutes up to a maximum of 10mcg/kg/min to maintain a SBP less than ***mmHg (Do not exceed 10mcg/kg/min for more than 10 minutes at any given time) Monitor thiocyanate levels if requiring infusion >3 days or dose \geq 4 mcg/kg/min ***Critical Care Units Only *** |
| NITROGLYCERIN (TRIDIL) | Start at 5mcg/min; then increase by 5mcg/min every 5 minutes up to a maximum of 20mcg/min to achieve SBP less than ***mmHg. If no response at 20mcg/min increase by 10mcg/min every 3 minutes up to a max 200mcg/minute***Critical Care Units Only *** |
| NOREPINEPHRINE (LEVOPHED) | Start at 0.02 mcg/kg/min; Adjust by 0.01 mcg/kg/min every 5 minutes up to a maximum of 1 mcg/kg/min to maintain MAP of 65 mmHg or greater. Contact physician for titration above 1 mcg/kg/min. ***Critical Care Units Only *** |
| PHENYLEPHRINE (NEOSYNEPHRINE) | Initial dose 0.5 mcg/kg/min; Adjust infusion by 0.1 mcg/kg/min every 5 minutes; max rate 2 mcg/kg/min; target MAP greater than or equal to 65 mmHg ***Critical Care Units Only *** |
| PROPOFOL (DRIPRIVAN) | Initiate rate at 10 mcg/kg/min; titrate by 5 mcg/kg/min every 5 minutes up to a maximum of 50mcg/kg/min to achieve Target RASS 0 to -1; ***Critical Care Units Only *** (Once spiked, bottle and tubing only good for 12 hours --- must be replaced every 12 hours) |
| ROCURONIUM (ZEMURON) | Initial bolus dose: 1mg/kg, then a continuous IV infusion of 8mcg/kg/minute; adjust rate by 0.8 mcg/kg/min every 60 minutes to maintain 1 to 2 twitches on a train of 4. Do not exceed 12 mcg/kg/min. Titrate sedation to a BIS of < 50. ***Critical Care Units Only*** |
| TIROFIBAN (AGGRASTAT) | Unstable angina/non-ST-elevation myocardial infarction (UA/NSTEMI): Bolus 25 mcg/kg over 5 minutes or less, followed by continuous infusion of 0.15 mcg/kg/minute for up to 18 hours. For patients with eCrCl < 60 ml/min: Reduce rate of continuous infusion to 0.075 mcg/kg/min |
| VASOPRESSIN | Shock —Start drip at 0.03 units/min; Dose titration not recommended in septic shock. Goal MAP 65 ***Critical Care Units Only*** |
| VECURONIUM (NORCURON) | Initial bolus 0.1mg/kg followed by a continuous infusion of 0.8mcg/kg/minute which can be increased by 0.3 mcg/kg/minute every 60 minutes up to 1.7mcg/kg/minute to maintain 1 to 2 twitches on a train of 4. Titrate sedation to a BIS of <50. ***Critical Care Units Only*** |