

# Critical Care Medication Administration

## 1. HEPARIN (units/hour):

*Given in LII, LI, HG, ER, HCHA, PACU, Cath Lab, MSONT*

Purpose: Anticoagulation. Used to treat Acute MI, CVA, DVT, etc.

- Identify concentration (25,000u/500cc)
- Identify usual bolus and continuous infusion dosage range (bolus 2,500-5,000 units; continuous 600-1,200 units/hour)
- Indicate adverse patient response (PTT > 2.5 x normal, signs of bleeding)

## 2. LIDOCAINE (mg/min):

*Given in LII, LI, HG, ER, HCHA, PACU, Cath Lab*

Purpose: Antiarrhythmic, Class Ib. Used to treat ventricular dysrhythmias.

- Identify concentration (2gm/500cc)
- Identify usual bolus and continuous infusion dosage range (bolus 1-1.5 mg/kg, continuous 1-4 mg/min) NOTE: MD may order "Per Pharmacy Protocol"
- Identify special nursing considerations (Post ECG strip pre, during, and post infusion; record vital signs pre bolus, q 15 min. X 1 hr after start of infusion, then q 4 hr)
- Indicate adverse patient response (CNS changes, nausea, Lido level > 5)

## 3. PROCAINAMIDE (mg/min):

*Given in LII, LI, HC, ER, HCHA, Cath Lab, Only steady state with decreasing IV dose while converting to oral permitted in MSONT*

Purpose: Antiarrhythmic, Class Ia. Used to treat atrial and ventricular dysrhythmias.

- Identify concentration (2gm/500cc)
- Identify usual dose range: Bolus 10-17 mg/kg. Per IV piggyback (mixed by pharmacy). Do not exceed 20 mg/min infusion rate. Continuous infusion 1-4 mg/min. NOTE: MD may order "Per Pharmacy Protocol"
- Identify special nursing considerations: Post ECG strip pre, during, and post infusion; measure the QTc before & after administration; record vital signs pre bolus, q 15 min. X 1 hr after start of infusion, then q 4 hr
- Normal Procan level = 4-8. NAPA levels accumulate in renal dysfunction, therefore, usually ordered only when creatinine is > 1.5.
- Indicate adverse patient response (prolonged QT, hypotension).

## 4. CARDIZEM (mg/hr):

*Given in LII, LI, HG, ER, HCHA, Cath Lab*

Purpose: Calcium channel blocker. Dilates coronary and peripheral arteries. Slows SA/AV node conduction times.

- Identify concentration (125mg/125cc)
- Identify usual bolus and continuous infusion dosage rate (0.25mg/kg IV push over 2-10 minutes. Begin continuous infusion at 5-15 mg/hr. Titrate in increments of 5mg/hr. If desired effect not obtained in 15 minutes, you may repeat bolus with 0.35 mg/kg IV over 2-10 minutes).
- Identify special nursing considerations (Monitor BP and HR pre bolus, q 15 minutes X one hour after start of infusion, then q 2 hours)
- Identify adverse patient response (Bradycardia, prolonged AV conduction and hypotension)
- Post rhythm strips pre, during, and after infusion, and with each dose change.

## 5. ADENOSINE:

*Given in LIII, LI, HG, ER, HCHA, Cath Lab*

Purpose: Antiarrhythmic. Slows conduction through the AV node.

- Identify bolus dosage range (6mg rapid IV push followed by 10cc NS, if no response after 1-2 minutes, may

repeat 12mg dose x2).

- Identify special nursing considerations (Post ECG strip pre, during, and post infusion; record vital signs pre bolus, post bolus, then q 15 min x 1 hr. **Administer half dose for central line!**)
- Identify adverse patient response (flushing, hypotension, 2-6 sec asystole)

#### 6. DOPAMINE (mcg/kg/min):

*Given in LII, LI, HC, ER, HCHA, PACU, OR, Cath Lab, Only renal dose (2-5 mcg/kg/min., non-titratable permitted in MSONT.)*

Purpose: Catecholamine. Positive inotrope/chronotrope. At low dose dilates mesenteric arteries; medium dose increases contractility and heart rate; high dose stimulates alpha effects, causing peripheral vasoconstriction.

- Identify concentration (400mg/250cc)
- Identify usual dosage for renal, beta, alpha (renal 2-5 mcg/kg/min, beta 5-10 mcg/kg/min, alpha 10-20 mcg/kg/min)
- Identify special nursing considerations: Monitor and record BP and HR q 2-15 minutes during initial administration & during active titration, then q 1-2 hours when stabilized. Hourly urine output, accurate I&O, daily weight. Evaluate patients' response (HR, BP, signs of improved cardiac output). **NOTE: MSONT, LII, HC, and HCHA dose < 5 mcg/kg/min, non-titrating.** Post ECG strip pre, during, and post infusion.
- Identify fluid status prior to initiation, correct hypovolemia before administration (ensure adequate hydration).
- Identifies antidote for dopamine infiltrate (regitine/Phentolamine).
- Describes Management of Extravasation:
  - Stop infusion
  - Notify MD; obtain order for Regitine (Phentolamine Mesylate); must be given within 12 hours.
  - Aspirate drug out of angiocath
  - Reconstitute 5 mg vial with 1 ml sterile water; then add 9 ml NS
  - Inject 0.5 ml into angiocath as you withdraw it; administer small doses subq in clockwise fashion surrounding the infiltrated area. Blanching should reverse immediately. Monitor site, if blanching should reoccur, additional injections of Regitine are required.
  - Document

#### 7. DOBUTAMINE (mcg/kg/min):

*Given in LII, LI, HG, ER, HCHA, PACU, OR (Heart Team), Cath Lab, MSONT, LII, HC, and HCHA dose < 5 mcg/kg/min, non-titrating*

Purpose: Catecholamine. Positive inotrope. Increases myocardial contractility, causes minor increase in coronary blood flow and heart rate.

- Identify concentration (250mg/250cc = 1,000 mcg/ml)
- Identify usual dosage range (2-20 mcg/kg/min)
- Identify special nursing considerations: Monitor and record BP and HR q 2-15 minutes during initial administration & during active titration, then q 1-2 hours when stabilized. Evaluate patients' response (HR, BP, signs of improved cardiac output). **NOTE: MSONT, LII, HC, and HCHA dose < 5 mcg/kg/min, non-titrating.** Post ECG strip pre, during, and post infusion.
- Identify fluid status prior to initiation, correct hypovolemia before administration (ensure adequate hydration).

#### 8. NITROGLYCERIN (mcg/min):

*Given in LII, LI, HG, ER, HCHA, PACU, OR, Cath Lab*

Purpose: Antianginal, antihypertensive. Decreases preload and afterload, dilates coronary arteries.

- Identify concentration (50mg/250cc)
- Identify usual dosage range (10-200 mcg/min). Titrate in increments of 10mcg/min q 5-15 minutes until stabilized, monitor & record HR/BP q 2-15 minutes during active titration & q 1-2 hrs when stabilized.
- Identify special nursing consideration for infusion (glass bottle, nonpolyvinyl tubing; post ECG strips pre, during, and post infusion; record vital signs pre, during, and post infusion). Evaluate patients' response (HR, BP, improved tissue perfusion)

9. **NIPRIDE** (mcg/kg/min):

*Given in LI, ER, PACU, OR*

Purpose: Antihypertensive. Reduces preload and afterload. Relaxes arterial and venous smooth muscle in hypertensive crisis.

- Identify concentration (50mg/250cc)
- Identify usual dosage range (0.1-10 mcg/kg/min). Titrate in small doses (0.1-0.5 mcg/kg/min. q 2-15 minutes) until stabilized. Continuously monitor HR and BP during infusion.
- Identify special nursing considerations: Solution is light sensitive, protect with foil; monitor cyanide levels with high dose infusion; post EGG strips pre, during, and post infusion. Evaluate patients' response (HR, BP, tissue perfusion)
- Identify potential adverse reaction: monitor closely for profound hypotension.

10. **ATROPINE**:

*Given in LII, LI, HG, HCCH, ER, Cath Lab, PACU, MSONT*

Purpose: Anticholinergic. Increase heart rate by blocking vagal effect. Reverse adverse effects of anticholinesterase agents (neostigmine).

- Identify concentration (0.4 mg ampules and 1 mg pre-filled syringes)
- Identify usual dose range (0.4-1 mg IV push). Maximum dose 0.03 to 0.04 mg/kg.
- Identify special nursing considerations (post EGG strips pre, during, and post infusion; record vital signs pre, during, and post infusion; increased heart rate may cause ectopy or changes in blood pressure; contraindicated in narrow angle glaucoma)
- Identify potential adverse reactions (constipation, dry mouth, urinary hesitancy)

11. **CORVERT (Ibutilide)**:

*Given in LII, LI, ER, HG, HCHA, Cath Lab*

Purpose: Antiarrhythmic, Class III. Used for conversion of atrial fib/flutter to NSR.

- Identify concentration (1 mg/10cc)
- Identify dose (1 mg in 10cc over 10 min.; may repeat 1 mg over 10min. if arrhythmia does not convert within 10 minutes)
- Identify special nursing considerations: Before administration: check serum potassium & magnesium levels & replace if necessary; measure QTc before & after administration for at least 4 hrs or until the QTc has returned to baseline; **LII, HC, and HCHA: cardiologist must be in attendance during administration & 20 min. post**, continuous EGG monitoring, post ECG strips pre, during, and post infusion; record vital signs pre bolus, then q 15 min x 1 hr post infusion, then q 4 hr
- Identify adverse patient response (prolonged QT, Torsades, A-V block)

12. **DIGOXIN (Lanoxin)**:

*Given in LII, LI, HG, ER, HCHA, Cath Lab, MSONT*

Purpose: Cardiac glycoside, positive inotrope, negative chronotrope. Used for CHF & supraventricular tachyarrhythmias.

- Identify concentration (0.5 mg/2m1)
- Identify usual dosage range (For digitalization: 0.25 - 0.5 mg IV push q 4 - 6 hours times 2-3 doses; maintenance 0.125 - 0.25 mg daily)
- Identify special nursing considerations: Obtain apical HR before administration, hold for HR < 60/min. & call MD; post EGG strips pre and post loading dose; record vital signs pre and post infusion; monitor & correct serum electrolytes (potassium, magnesium & calcium)
- Identify adverse patient response (monitor for AV block, arrhythmias, vomiting, confusion & visual disturbances)

13. **METOPROLOL (Lopressor)**:

*Given in LIL LI, HC, HCHA, ER, Cath Lab, MSONT*

Purpose: Beta adrenergic blocker. Blocks stimulation of beta1 receptors in the heart causing a decrease in myocardial O<sub>2</sub> demand. Given as an antianginal, antihypertensive, or to prevent MI.

- Identify concentration (1 mg/1 ml)
- Identify usual dose range (5mg slow IV push, may be repeated q 15 minutes x 3)
- Identify nursing considerations (monitor vital signs and EGG every 5-15 minutes during therapy, and for 2 hours after dosing)
- Identify adverse patient response (bradycardia, CHF, hypotension)

#### 14. **LABETALOL (Normodyne):**

*Given in LII, LI, HC, HCHA, ER, Cath Lab*

Purpose: Beta adrenergic blocker. Inhibit beta1 and beta2 receptors in heart, bronchioles, and blood vessels. Primary effect is decrease in heart rate and blood pressure.

- Identify concentration (5mg/1cc)
- Identify usual dose range (20 mg slow IV push over 2 minutes, may repeat 20-40 mg IV)
- Identify special nursing considerations (Labetalol has alpha blocking activity which may result in more orthostatic hypotension; assess pulmonary status; monitor vital signs and EGG every 5-15 minutes during therapy and for 2 hours after therapy)
- Identify adverse patient response (bradycardia, CHF, orthostatic hypotension)

#### 15. **REGULAR INSULIN (units/hr):**

*Given in LII, LI, HC, ER, HCHA, PACU, Cath Lab, MSONT*

Purpose: Regulate blood glucose in diabetes mellitus or ketoacidosis

- Identify concentration (50 units/100cc)
- Administer bolus and infusion (bolus 5-15 units IV push, continuous infusion 2-10 units/hour)
- Evaluate patient's response; BG Chems Q 1-2 hours
- Identify special considerations (monitor potassium levels, watch for hypoglycemia)

#### 16. **BREVIBLOC (mcg/kg/min):**

*Given in LI, ER*

Purpose: Beta blocker. Negative inotrope, chronotrope. Slows rate of SA node, slows conduction through AV node, decreases myocardial O<sub>2</sub> consumption.

- Identify concentration (2.5 gms/250cc)
- Identify usual dosage (loading 500 mcg/kg/min over 1 minute, maintenance 50-300 mcg/kg/min)
- Post EGG strip pre, during, and post infusion; record vital signs pre, during, and post infusion
- Identify special considerations (use caution with Bradycardia or heart block, short acting)

#### 17. **PRIMACOR (Milrinone) (mcg/kg/min):**

*Given in LI*

Purpose: Positive inotrope. Increases cardiac output and reduces preload and afterload. Used to treat CHF & improve LV function post coronary bypass.

- Identify concentration (200mcg/ml)
- Identify usual dosage (loading dose: 50 mcg/kg IV over 10 minutes; maintenance dose: 0.375 - 0.75 mcg/kg/min)
- Identify special nursing considerations: Post ECG strip pre, during, and post infusion; continuously monitor HR/BP during infusion; monitor serum potassium & correct before administration of drug; monitor platelets before & during therapy. Evaluate patient response (improved cardiac output, HR, BP, and urine output)
- Identify potential adverse reactions: dysrhythmias, hypotension, thrombocytopenia

#### 18. **BRETYLIUM (mg/min):**

*Given in LI, ER*

Purpose: Antiarrhythmic. Used to treat ventricular arrhythmias not responsive to first line medications.

- Identify concentration (1gm/250cc)
- Identify usual dosage (loading 5 mg/kg IV push, may repeat 10mg/kg after 15 minutes to max load of 35 mg/kg, maintenance dose 1/2 mg/min)
- Identify special nursing considerations: Post ECG strip pre, during, and post infusion; record vital signs pre, during, and post infusion; can cause severe hypotension, use caution in digitalized patients, can cause vomiting with rapid infusions. Evaluate patient response (cardiac rhythm, HR, BP)

#### 19. **SODIUM BICARB:**

*Given in LII, LI, HC, ER, HCHA, Cath Lab, MSONT*

Purpose: Neutralizer used to treat acidosis.

- Administer bolus and infusion based on pH and lab as ordered (bolus 1-2 amps IV push, continuous infusion per MD order).
- Evaluate patient's response (labs)
- Identify special nursing considerations: (monitor K levels, pH; **do not mix with other drugs**)

#### 20. **EPINEPHRINE** (mcg/min):

*Given in LI, ER, OR (Heart team)*

Purpose: Catecholamine. Used as a cardiac stimulant and bronchodilator during cardiac arrest and anaphylaxis.

- Identify concentration (2mg/250cc)
- Identify usual bolus and continuous infusion dosage range: Bolus 1mg every 3- 5 min, continuous infusion 2-10 mcg/min. Titrate in small doses (0.5 - 1 mcg/min.) q 2-15 minutes until stabilized, continuously monitor HR/BP during infusion.
- Identify special nursing considerations: (can cause V-fib, wean medication off; use in central line as tissue sloughing may occur; monitor for hyperglycemia)

#### 21. **ISUPREL** (mcg/min):

*Given in LI, ER.*

Purpose: Catecholamine. May be used to treat bradycardia, heart block, shock, or bronchospasms.

- Identify concentration (2mg/250cc)
- Identify usual dosage range (2-20 mcg/min). Titrate in small doses (0.5 - 1 mcg/min.) q 2-15 minutes until stabilized; continuously monitor HR/BP during infusion.
- Identify special considerations (watch for pulmonary edema, hypotension, use caution with beta blockers, correct hypovolemia)

#### 22. **NEOSYNEPHRINE** (mcg/min):

*Given in LI, ER, OR, PACU*

Purpose: Adrenergic. Powerful alpha stimulator; causes potent vasoconstriction.

- Identify concentration (20mg/250cc)
- Identify usual dosage range (20-200 mcg/min). Titrate in doses of 10 mcg/min q 2-15 minutes. Continuously monitor HR/BP during infusion.
- Identify special nursing considerations (wean off, do not stop abruptly, titrate for effect; correct hypovolemia; for infiltration, inject with phentolamine)

#### 23. **PROPOFOL** (mg/kg/min):

*Given in LI*

Purpose: Anesthetic. Produces CNS depression; frequently used as a sedative in mechanically ventilated patients.

- Identify concentration: 1000mg/ 100cc
- Identify usual dose range: Induce with 5 mcg/kg/min. Continuous infusion 5 - 50 mcg/kg/min.

- Identify special nursing considerations: Continuously monitor HR, BP, respirations, and LOC.
- Identify adverse patient response: Hypotension, bradycardia, and oversedation may occur.
- Identify special considerations: mix in glass container only. Do not mix with other agents.

#### 24. **VERAPAMIL (Calan):**

*Given in LII, LI, HC, HCHA, ER, Cath Lab*

Purpose: Calcium channel blocker. Used in the management of supraventricular tachyarrhythmias such as SVT, atrial fibrillation and atrial flutter.

- Identify concentration (2.5 mg/ml)
- Identify usual dose: 2.5-5 mg IV push over 1-2 minutes, may repeat with 5-10 mg after 15-30 minutes.
- Identify special nursing considerations: Post rhythm strip pre and post dose; monitor and record HR/BP pre bolus & q 15 min x 1 hr post bolus. Do not use with concurrent IV beta blocker therapy; contraindicated in 2nd or 3rd degree AV block; do not administer if systolic BP < 90. Patient should remain recumbent for one hour following IV administration to minimize hypotensive effects.

#### 25. **REOPRO (mcg/min):**

*Given in LI, HC, HCHA, Cath Lab*

Purpose: Antiplatelet. Used with heparin and/or ASA post PTCA to prevent reclosure of affected arteries.

- Identify concentration: 7.2 mg/250cc
- Identify usual dose: Bolus 250 mcg/kg 10-60 min prior to PTCA, followed by 10 mcg/min infusion x 12 hours. For patients < 80 kgs, 0.125 mcg/kg/min x 12 hours. Must use filter (separate filter for bolus and infusion).
- Identify patient response: May cause hypotension, atrial fib/flutter, AV block.
- Identify special nursing considerations: May cause thrombocytopenia, observe for bleeding. Monitor and record VS er unit routine.

#### 26. **AMIODARONE (Cordarone):**

*Given in LII, LI, HC, HCHA, ER, Cath Lab*

Purpose: Antiarrhythmic, Class III. Used to treat atrial and ventricular dysrhythmias not controlled by other agents.

- Identify concentration (SOOmg/2SOcc)
- Identify usual dose: Bolus dose 150 mg in 100cc over 10 minutes. Continuous infusion 1 mg/min x 6 hours, then 0.5 mg/min x 18 hours.
- Identify special nursing considerations: Monitor pulmonary status, observe for development of CHF, monitor QTc before, during, and after therapy. Continuous ECG monitoring. Post rhythm strips pre and post administration. Monitor BP and HR pre bolus, q 5-15 minutes x one hour after start of infusion, then q 4 hours.
- Identify adverse patient response: Hypotension, prolonged QT (leading to Torsades), CHF, pulmonary fibrosis, and hepatotoxicity.
- Identify special considerations: Very expensive, mixed in glass bottle, administer with filter needle (changed with each bottle).

#### 27. **OCTREOTIDE (Sandostatin):**

*Given in LII, LI, HC, HCHA, ER, MSONT*

Purpose: Treatment of severe diarrhea. Treatment of GI bleeding (decreases splanchnic blood flow).

- Identify concentration: 250mcg/250cc D5W= 1 mcg/ml.
- Identify usual dose range: 50-100 mcg IV push over 1-2 minutes loading dose followed by 25-50 mcg/hr for 1-5 days.
- Identify special nursing considerations: Monitor serum blood sugar daily (decreases availability of insulin). Decreases gall bladder motility, observe for GB disease. May potentiate effects of beta blockers and calcium channel blockers.
- Identify potential adverse effects: Abdominal pain/distension, elevation of liver enzymes.

#### 28. **PROPRANOLOL (Inderal):**

*Given in LII, LI, HC, HCHA*

Purpose: Beta blocking agent. Inhibit beta, and beta2 receptors in heart, bronchioles, and blood vessels. Primary effect is decrease in heart rate and blood pressure.

- Identify usual dose range: 1-3 mg slow IV push, may be repeated after 2 min.
- Identify special considerations: Consider holding medication if HR < 60 and systolic BP < 90. Monitor BP and HR every 5-15 minutes during therapy and for one hour after administration. Post rhythm strips pre and post administration.
- Identify adverse effects: Bradycardia, hypotension, CHF.