ICU Drips
Stephanie Sanderson, RN, MSN, CNS, CCNS, CCRN
Medical Cardiac ICU-UNMH
Objectives

- Discuss commonly used medication drips in the intensive care setting.
- Review criteria for using specific medications.
- Discuss possible complications and adverse side effects of medications.
Hemodynamic instability/shock

- Norepinephrine (Levophed)
- Epinephrine
- Phenylephrine (Neosympinephrine)
- Vasopressin
- Dopamine
- Dobutamine
**Levophed**

- Levophed: normal dose 1-20 mcg/min
- Alpha/Beta agonist
- Titrate to desired effect (MAP greater than 65) Mix 4mg in 250 ml NS or D5W
- Quick acting
- Assure adequate fluid resuscitation
- Maintain adequate pH, monitor blood pressure continuously, administer via central line to prevent extravasation.
Epinephrine

- Used for profound, refractory hypotension
- Give centrally to avoid the risk of extravasation
- 1 mcg/kg to start, titrate to 3-4 mcg/kg if necessary. Mix 4 mg in 250 ml D5W or NS
- Causes hyperglycemia so monitor blood glucose levels with high doses and prolonged administration
Phenylephrine

- Use for profound hypotension-use cautiously in elderly, CAD, and hypovolemia.
- Do not use in patients with cardiogenic shock or elevated SVR.
- Give centrally to avoid extravasation.
- Dose 100-180 mcg/min, mix 40 mg in 250 ml D5W or NS.
Vasopressin

- Use as a second line vasopressor (use to augment Levophed).
- Use for infusion and cardiac arrest is off label.
- Continuous infusion mix 40 units in 1000 ml NS and infuse at 0.04 units/minute.
- Administer centrally due to vesicant properties.
Dopamine

- Adrenergic Agonist
- Used to enhance hemodynamic support.
- Mix 400 mg in 250 ml D5W or NS, start at 2-3 mcg/kg/min and titrate up to 20 as needed.
- Causes significant tachycardia, especially in the presence of heart disease or hypovolemia.
- Give centrally if at all possible, especially high doses (10-20 mcg).
Dobutamine

- Adrenergic Agonist
- Used to treat cardiogenic shock (chemical balloon pump reduces afterload but increases rate and contractility).
- Off label use includes administration for decompensated hemodynamics related to sepsis.
- Use with caution in the presence of hypovolemia.
- Mix 500 mg in 250 ml D5W and start infusion at 1-2 mcg/kg/min and titrate up slowly and carefully.
- If the tank isn’t full, the patient will develop profound hypotension. Do not continue infusion until fluid volume status is addressed.
Considerations

- All vasoactive drips effects are dose dependent.
- All of the drips discussed previously must be administered via an infusion pump.
- Elderly patients respond differently and need to be monitored carefully.
- Patients requiring vasoactive drips should have an arterial line for blood pressure monitoring.
- It is essential to assure that fluid volume status is being addressed during administration of this type of medication. "Fill the Tank"!
- Most all are pro-arrhythmic so careful monitoring is essential and recognition of lethal arrhythmias is crucial.
- All cause serious tissue injury if infiltration occurs. Administer centrally if at all possible.
- Correct acidosis to improve the effectiveness of the drip.
Antihypertensives and Rate controllers

- Nicardipine
- Nitroprusside
- Nitroglycerine
- Amiodorone
- Esmolol
Nicardipine

- Calcium Channel Blocker
- Antihypertensive used when PO treatment is not feasible.
- Used to control hypertension and blood pressure elevation in acute ischemic stroke.
- Mix 50 mg in 250 ml D5W and administer 0.3-10 mcg/kg/min
Nitroprusside

- Vasodilator
- Used to manage acute hypertensive crisis, decompensated heart failure and to control bleeding during surgery.
- Mix 50 mg in 250 ml D5W and start infusion at 0.3 mcg/kg/min and increase slowly to a max dose of 10 mcg/kg/min.
- Use cautiously in renal impaired patients.
- Monitor for cyanide toxicity.
- Use very cautiously in patients with aortic stenosis as the use of this medication can decrease coronary artery perfusion.
- Titrate off slowly to prevent seizure activity.
Nitroglycerine

- Nitrate
- Vasodilator
- Used for acute angina, hypertensive crisis and pulmonary edema
- Mix 50 mg in 250 ml D5W dose 10-200 mcg/min
- Start slowly and titrate up. If drip is at 200 mcg/min, and the patient is still hypertensive or experiencing angina, another agent needs to be considered.
- Drug of choice for cocaine induced MI or chest pain.
Amiodarone

- Antiarrhythmic Agent-Class III
- Used in the management of life threatening ventricular fibrillation.
- Also used to treat rapid atrial arrhythmias causing hemodynamic instability.
- Administer a loading dose and then begin the drip. Loading dose 5-7 mg/kg over 15-30 minutes. Mix drip 900 mg in 500 ml D5W (1 mg/min for 6 hours and 0.5 mg/min for 18 hours then DC).
- Use a .22 micron filter during administration.
**Esmolol**

- Antiarrhythmic Class II, Beta Blocker
- Used to treat tachyarrhythmias such as SVT or sinus tachycardia.
- Can also be used for post operative hypertension.
- Careful dosing is essential as drug is very quick acting.
- Can use loading dose or not depending on the hemodynamics.
- Mix 2500 mg in 250 ml D5W.
- Administer bolus of 1 mg/kg over 30 seconds and begin drip at 150 mcg/kg/min, titrating to 300 mcg/kg/min if necessary.
Considerations

- Monitor all patients but especially the elderly for hypotension and arrhythmias.
- Medications must be administered via an infusion pump.
- Titrate medications thoughtfully and do not discontinue medications without titrating them down first.
- Nitroprusside turned off without weaning can cause vasospasms leading to seizure activity.
- Beta blockers can cause bronchospasms so use caution in patients with pulmonary disease.
- Be mindful of using beta blockers with calcium channel blockers as this can cause complete heart block.
- Monitor all patients for signs of anaphylaxis.
- These medications can all be administered peripherally but central access is optimal.
- Avoid extravasation.
Sedation and Analgesia

- Fentanyl
- Ativan
- Precedex
- Propofol
- Versed
Fentanyl

- Analgesic Opiate
- Used to relieve pain or as an adjunct to general anesthesia.
- Mix 1000 mcg in 100 ml NS administer 25-200 mcg/hour. Can administer up to 700 mcg/hour in the critically ill, mechanically ventilated patient.
- If fentanyl is not effective in relieving pain, consider using morphine instead.
Ativan

- Benzodiazepine
- Used to treat anxiety and seizure activity.
- Used as a sedative in the critical care setting.
- Off label use: management of AWS (Acute Alcohol Withdrawal Syndromes).
- Also can be used as an antiemetic adjunct.
- Mix 50 mg in 50 ml NS and administer 1-15 mg/hour.
- Understand the half life and depot effect of the drug!
Precedex

- Alpha Adrenergic Agonist/Sedative
- Used for ICU sedation and for the treatment of AWS.
- Mix 200 mcg/ in 50 ml NS
- Loading dose (as long as patient is hemodynamically stable) 1 mcg/kg over several minutes. Begin drip and administer 0.2-0.7 mcg/kg/min.
- Off label to use drug longer than 24 hours.
- Use carefully in the presence of hypotension.
Propofol

- General Anesthetic
- 10 mg/ml (100 ml bottles)
- Lipid based - 5-50 mcg/kg/min
- Use carefully in patients with GI disorders.
- Must be given alone without any other infusions in the port it is being administered in.
- Tubing changes done every 12 hours to prevent infection.
- Monitor lipase and triglycerides.
- Assure euvoolemia prior to administration.
- Do not bolus!
Versed

- Benzodiazepine
- Used in the ICU for sedation, treatment of anxiety and procedural sedation.
- Can be given in bolus doses or as a continuous infusion. (1-5 mg every 15-30 minutes)
- Mix 100 mg in 100 ml NS and administer 1-5 mg/hour.
- Shorter acting and onset of action is faster than Ativan.
Considerations

- Use these medications cautiously in the elderly.
- Assure that fluid volume status is adequate when administering Precedex and Propofol because both medications can cause profound bradycardia and hypotension.
- All medications except the Precedex will cause respiratory depression!
- Propofol should not be given to an unintubated patient and if it is, someone with the ability to intubate needs to be present during administration of the medication.
- Propofol is not bolused when being given as a continuous infusion. Titrate the drip up until desired effect is reached.
- Daily sedation vacations help to clear the drug and allow for liberation from the ventilator sooner.
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- Winner receives 1 year of FREE CME/CE!
Upcoming RHEO Sessions...

- May 25 (Wednesday) at 15:00
- **Trauma Assessment**
  - Joan Deis, RN (Director, UNMH Clinical Education)
Thank You!