Alternatives to hydralazine injection during shortage (11/10/14)

Due to an ongoing shortage of intravenous hydralazine, providers are encouraged to use alternate antihypertensive agents. Note: **Oral hydralazine is not on shortage. Providers are encouraged to use oral antihypertensives when it is appropriate to do so.** Consider adjusting the existing antihypertensive regimen before adding a new agent, and IV options may be reserved for acute control in emergent situations. A list of alternative agents available at John Dempsey Hospital is listed below. Please refer also to hospital IV medication guidelines and other resources for additional information.

Drug	Common Adult Dosing	Suggested Maximum Dose	Comments
Oral			
Hydralazine	10 to 25 mg PO 4 times daily	Maximum 300 mg/day	
Captopril	12.5 to 25 mg PO 2 to 3 times per day (May adjust by 12.5 to 25 mg/dose at 1 to 2 week intervals)	50 mg 3 times per day	Avoid in patients with bilateral renal artery stenosis
Clonidine	0.1 mg PO 2 times per day (Increase dose gradually as needed)	In maintenance therapy, doses up to 1.2 mg twice daily may be used	Abrupt discontinuation of this medication may lead to rebound hypertension
IV Intermittent			
Labetalol	5 to 20 mg slow injection over 2 mins (May repeat 40 or 80 mg at 10 min intervals as needed)	Maximum 300 mg	Avoid β-blockers in symptomatic bradycardia, heart block, or severe acute decompensated heart failure. Labetalol also has α-blocking activity. Does not elevate intracranial pressure
Enalaprilat	1.25 mg diluted in 5 ml 0.9% NaCl over 2 to 3 minutes (May administer q 6hrs)	5 mg q6 hrs	Avoid in patients with bilateral renal artery stenosis
Metoprolol	1.25 to 10 mg over 1 to 2 minutes (May administer q4 hrs, q 6 hrs, or q8 hrs)		Avoid β-blockers in symptomatic bradycardia, heart block, or severe acute decompensated heart failure.
Verapamil	2.5 to 10 mg over at least 2 minutes (may repeat dose x 1 if no response in 15-30 mins)		
IV Continuous Infusion			
Nicardipine	2.5 to 5 mg/hr initially (May adjust 2.5 mg/hr q5 min)	15 mg/hr	Does not elevate intracranial pressure
Nitroglycerin	10 mcg/min initially (May adjust 10 mcg/min q5 min)	200 mcg/min	Dose appropriately to minimize the development of tolerance
Nitroprusside	0.3 mcg/kg/min initially (May adjust 0.3 mcg/kg/min q5 min)	10 mcg/kg/min	Monitor for cyanide toxicity with high doses and extended courses of therapy
Esmolol	500 mcg/kg loading dose over 1 min followed by continuous infusion of 50 mcg/kg/min for 5 min (May increase rate of continuous infusion by 50 mcg/kg/min)	Maximum rate of 200 mcg/kg/min	β-blockers should not be used in symptomatic bradycardia, heart block, or severe acute decompensated heart failure
Labetalol	5 to 20 mg loading dose followed by doses of 40 to 160 mg q10 min as needed up to a maximum of 300 mg, followed by continuous infusion at 0.5 mg/min (May rebolus then increase by 0.5 mg/min q15-30 min)	2 mg/min (Maximum 300 mg/day)	Avoid β-blockers in symptomatic bradycardia, heart block, or severe acute decompensated heart failure. Labetalol also has α-blocking activity. Does not elevate intracranial pressure

References: 1.) University of Connecticut Health Center/John Dempsey Hospital IV Medication Guidelines; 2.) Soto-Ruiz KM, Peacock WF, Varon J. Perioperative hypertension: diagnosis and treatment. *Neth J Crit Care.* 2011; 15(3): 143-148.; 3.) Lexi-Comp, Inc. (Lexi-Drugs®). Lexi-Comp, Inc.; November 6, 2014; 4.) Micromedex® 2.0 Truven Health Analytics, Inc.Greenwood Village, CO. Available at www.micromedexsolutions.com. Accessed November 10, 2014.