Vasopressors & Ionotropes			
Agent	**Dose range (mcg/kg/min)**	**Mechanism**	**Considerations**
Dopamine	1-20 (1-5 mostly affects DA; 6-10 β_1; 11-20 alpha 1)	DA, β_1, α_1,	• Lower doses primarily cause inotropy and chronotropy (β1); DA-mediated splanchnic vasodilation of uncertain clinical significance • Higher doses will increase SVR and chronotropy, could decrease CO • Can be used w/ norepinephrine for distributive or hypovolemic shock as higher doses increase SVR
Epinephrine	0.05-1	β_1, $\beta_2 > \alpha_1$	• Increases CO, SVR w/ effects on CO > effects on SVR • Due to strong inotropic effects, preferred agent for cardiogenic shock
Norepinephrine	0.01-1	$\alpha_1 > \beta_1 > \beta_2$	Primarily increases SVR, minimal change to HR
Milrinone	0.25-1	Phosphodiesterase inhibitor	• Positive inotrope and decreases SVR (SVR effect more prominent - BP likely to decrease even if CO increases) • Useful for cardiogenic shock (CHF) w/ normal or high BP to reduce afterload and increase CO

Hypertensive Crisis	
Definitions	• **Hypertensive Urgency**: severe elevation in blood pressure W/O evidence of acute end organ damage • **Hypertensive Emergency**: BP>Stage II HTN for age W/ evidence of acute end organ damage
Etiology	• **Neonates**: renovascular disease, congenital renal anomalies, BPD, coarctation • **Children**: renovascular disease, glomerulonephritis, endocrine disease • **Adolescents**: renovascular disease, drugs (cocaine, amphetamines, Serotonin Syndrome)
Clinical Manifestations	• **Hypertensive encephalopathy**: headache, altered MS, vision changes, seizures, acute stroke • **Myocardial ischemia**: acute chest pain, dyspnea, orthopnea, cough. Can hear diffuse, fine crackles at lung base, S3 gallop. • **Aortic Dissection**: Chest, abdominal pain, end-organ dysfunction. • Retinal hemorrhages and exudates • **Malignant nephrosclerosis**: leading to acute renal failure, hematuria, and proteinuria • **Posterior Reversible Encephalopathy Syndrome (PRES)**: Encepholopathic or seizing patient in setting of acute hypertensive crisis w/ neuroimaging findings of reversible vasogenic subcortical edema w/o infarction. Edema usually seen in parietal and occipital lobes
Diagnostic Studies	• 4 Extremity BP's • Fundoscopic Exam. • Chem 10 to evaluate for renal impairment • CBC and +/- reticulocyte count and smear to look for microangiopathic anemia • UA to look for hematuria, proteinuria • EKG to look for evidence of LVH or myocardial ischemia • CXR if chest pain or SOB (look for cardiac enlargement, pulmonary edema) • Head CT or MRI if abnormal neurologic exam or mental status • Consider tox screen, pregnancy test, endocrine testing to look for underlying cause