| PRESSOR | MECHANISM | RISKS | INDICATION | DOSING |
|---|---|---|---|---|
| Norepinephrine | - α-1 and α-2 agonism (balanced venous and arterial vasoconstrictor)<br>-Small amount of β-1 stimulation (increased chronotropy) | -Considered to be safer than other pressor choices<br>-Cardiac myocyte toxicity, cardiac arrhythmia, tissue ischemia | 1st-line: septic, neurogenic, cardiogenic shock | 2-4 mcg/min, titrate to effect |
| Epinephrine | -β-1 and β-2 agonism (increased inotropy and chronotropy, with small amount of bronchodilation)<br>-Small amount of α-1 agonism, leading to peripheral vasoconstriction | -Tachycardia<br>-Lactic acidosis (unclear whether this is clinically significant) | 1st-line: anaphylaxis<br>2nd-line: sepsis<br>*Avoid in cardiogenic shock | Anaphylaxis:<br>0.1 mg bolus, then<br>2-15 mcg/min<br>Sepsis: 0.05 mcg/kg/min – 2 mcg/kg/min |
| Dopamine | -Low doses: dopaminergic agonism (renal vasodilation, increased GFR; can lower BP)<br>-Moderate doses: β-1 agonism (inotropy and chronotropy)<br>-High doses: α-1 agonism (vasoconstriction) | **High risk for dysrhythmias<br>-Possibly independently associated with increased mortality | Rarely indicated<br>2nd-line: shock refractory to other pressors | 2-20mcg/kg/min |
| Dobutamine | -β-1>>β-2 agonism (predominantly inotropic effects, with small amount of vasodilation and chronotropy)<br>-High doses: mild α-1 agonism | -Increased myocardial oxygen demand, arrhythmias<br>-Possible hypotension<br>-Only use if fully fluid resuscitated or with vasopressor | -Septic shock with decreased cardiac output (despite adequate fluid resuscitation)<br>-Possibly first line for cardiogenic shock after MI | 2-20 mcg/kg/min |
| Milrinone | -PDE3 inhibition (ultimately leads to cardiac smooth muscle relaxation and peripheral vasoconstriction)<br>-No beta-adrenergic activity, so minimal chronotropy | -Hypotension (only use after fully fluid resuscitated, and/or with vasopressor)<br>-Sustained hypotension, dysrhythmias<br>-Avoid in patients with renal disease | -Exact indication is unclear<br>-Daily beta-blocker use, catecholamine resistance<br>-Possible role in patients with pulmonary HTN | -NEVER bolus<br>-Dose based on renal function<br>-General range: 0.25-0.75 mcg/kg/min |
| Vasopressin | -Directly stimulates vasopressin receptors in kidney (efferent arteriole constriction→ increased GFR) peripheral vasculature (vasoconstriction) | -Increased risk for digital ischemia (higher risk than catecholamine derivatives), especially when given with epinephrine | -2nd-line: septic shock<br>-May be useful (but role not well-established): cardiogenic shock, pulmonary hypertension | 0.04 U/min (set dose; no bolus, no titration) |
| Phenylephrine | -Pure α-1 agonism (vasoconstriction) | -Reflex bradycardia (only give with a chronotropic agent, to avoid this effect!)<br>-Digital ischemia<br>-Possibly worsened cardiac function, end-organ perfusion | -Never use as a single agent<br>-May be used with norepinephrine in neurogenic shock<br>-May serve a role in vasodilatory hypotension due to medication overdose | Start at 100-180 mcg/min, then titrate to maintenance (40-60 mcg/min)<br>-Can administer 50-200 mcg q20min PRN |

| Type of Shock | Pressor recommendation (and dose) |
|---|---|
| Septic | 1st line: norepinephrine (2-4 mcg/min, titrate to effect)<br>2nd line: Vasopressin (0.04 U/min) or epinephrine (0.05 – 2 mcg/kg/min)<br>*Septic shock with evidence of decreased cardiac output, with adequate fluid resuscitation: consider dobutamine (2-20 mcg/kg/min) |
| Cardiogenic | **Controversial<br>SBP 70-100 mmHg:<br>1st line: dobutamine (2-20 mcg/kg/min)<br>2nd line: norepinephrine (2-4 mcg/min, titrate to effect)<br>3rd line: milrinone (controversial) (0.25-0.75 mcg/kg/min; be cautious in renal disease)<br>SBP <70 mmHg:<br>1st line: norepinephrine<br>*Patients with daily beta-blocker use and/or long-standing heart failure: consider milrinone<br>*Vasopressin's role in cardiogenic shock is not well-established, but it may be beneficial |
| Neurogenic | 1st line: norepinephrine (2-20 mcg/min)<br>2nd line: Phenylephrine (only use as adjunct to norepinephrine) (initially 100-180 mcg/min, titrate to 40-60 mcg/min maintenance; bolus 50-200 mcg q20min PRN) |
| Anaphylactic | 1st line: epinephrine (initial bolus of 0.1 mg (1:10,000) over 5 minutes, followed by an infusion of 2-15 mcg/min) |