

<b>Alert</b>	Ensure dopamine has a "dedicated" line to avoid accidental bolus. Do not use as a side line with maintenance fluids.												
<b>Indication</b>	Treatment of hypotension. May also be used to improve renal perfusion.												
<b>Action</b>	Catecholamine with alpha and beta adrenergic, dopaminergic and serotonergic actions Haemodynamic effects are dose dependent: <sup>1</sup> <ul style="list-style-type: none"> <li>•Low dose 1 to 5 microgram/kg/min – increases renal blood flow and glomerular filtration rate.</li> <li>•Intermediate dose 5 to 10 microgram/kg/min – increases cardiac output and blood pressure. Increases renal blood flow.</li> <li>•High dose 10 to 20 microgram/kg/min – systemic vasoconstrictor effect outweighs all other effects<sup>2</sup>. Reduces renal blood flow<sup>1</sup>.</li> </ul>												
<b>Drug type</b>	Inotropic vasopressor.												
<b>Trade name</b>	Dopamine concentrate DBL												
<b>Presentation</b>	200 mg/5 mL												
<b>Dose</b>	1–20 microgram/kg/minute												
<b>Dose adjustment</b>													
<b>Maximum dose</b>	Use doses 10–20 microgram/kg/minute with caution.												
<b>Total cumulative dose</b>													
<b>Route</b>	Continuous IV infusion.												
<b>Preparation</b>	<p><b>SINGLE STRENGTH continuous IV infusion</b></p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Infusion strength</th> <th style="width: 50%;">Prescribed amount</th> </tr> </thead> <tbody> <tr> <td>1 mL/hour = 10 microgram/kg/minute</td> <td>30 mg/kg dopamine and make up to 50 mL</td> </tr> </tbody> </table> <p>Draw up 0.75 mL/kg (30 mg/kg) of dopamine and add glucose 5%# to make a final volume of 50 mL. Infusing at a rate of <b>1 mL/hour = 10 microgram/kg/minute</b>.</p> <p><b>DOUBLE STRENGTH continuous IV infusion</b></p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Infusion strength</th> <th style="width: 50%;">Prescribed amount</th> </tr> </thead> <tbody> <tr> <td>1 mL/hour = 20 microgram/kg/minute</td> <td>60 mg/kg dopamine and make up to 50 mL</td> </tr> </tbody> </table> <p>Draw up 1.5 mL/kg (60 mg/kg) of dopamine and add glucose 5%# to make a final volume of 50 mL. Infusing at a rate of <b>1 mL/hour = 20 microgram/kg/minute</b>.</p> <p><b>QUADRUPLE STRENGTH continuous IV infusion – Can be used for infants up to 2500 g.*</b></p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Infusion strength</th> <th style="width: 50%;">Prescribed amount</th> </tr> </thead> <tbody> <tr> <td>1 mL/hour = 40 microgram/kg/minute</td> <td>120 mg/kg dopamine and make up to 50 mL</td> </tr> </tbody> </table> <p>Draw up 3 mL/kg (120 mg/kg) of dopamine and add glucose 5%# to make a final volume of 50 mL. Infusing at a rate of <b>1 mL/hour = 40 microgram/kg/minute</b>.</p> <p>*Maximum diluted concentration is 6 mg/mL.</p> <p>#Sodium chloride 0.9% can be used as a diluent, but only to make a maximum concentration of 3.2 mg/mL dopamine solution.</p>	Infusion strength	Prescribed amount	1 mL/hour = 10 microgram/kg/minute	30 mg/kg dopamine and make up to 50 mL	Infusion strength	Prescribed amount	1 mL/hour = 20 microgram/kg/minute	60 mg/kg dopamine and make up to 50 mL	Infusion strength	Prescribed amount	1 mL/hour = 40 microgram/kg/minute	120 mg/kg dopamine and make up to 50 mL
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<b>Administration</b>	Continuous intravenous infusion via a central line. Use with caution via a peripheral line.												
<b>Monitoring</b>	Continuous heart rate, ECG and blood pressure monitoring preferable. Assess urine output and peripheral perfusion frequently. Observe IV site closely for blanching and extravasation.												
<b>Contraindications</b>	Arrhythmia and tachyarrhythmia.												
<b>Precautions</b>	Ensure adequate circulating blood volume prior to commencement. May increase pulmonary pressures.												
<b>Drug interactions</b>	Hypotension may be observed with concurrent use of vasodilators such as glyceryl trinitrate, nitroprusside and calcium channel blockers. Concurrent use of digitalis glycosides may increase the risk of cardiac arrhythmias. Concurrent use of IV phenytoin with dopamine may result in dose dependent, sudden hypotension and bradycardia.												
<b>Adverse reactions</b>	Tachycardia and arrhythmia. Systemic and pulmonary hypertension especially at higher doses. Reversible suppression of prolactin and thyrotropin secretion. Tissue necrosis at infusion site with extravasation.												

<b>Compatibility</b>	<p>Fluids: Glucose 5%, glucose 10%, glucose in sodium chloride solutions, glucose 5% in Hartmann's, Hartmann's, mannitol 20%, sodium chloride 0.9%</p> <p>Y-site: Amino acid solutions, amifostine, amiodarone, anidulafungin, atracurium, aztreonam, bivalirudin, caffeine citrate, caspofungin, ceftaroline fosamil, ciprofloxacin, cisatracurium, dexmedetomidine, dobutamine, esmolol, ethanol, fluconazole, foscarnet, glyceryl trinitrate, granisetron, haloperidol lactate, heparin sodium, hydrocortisone sodium succinate, labetalol, lignocaine, linezolid, methylprednisolone sodium succinate, metronidazole, midazolam, milrinone, morphine sulfate, mycophenolate mofetil, noradrenaline, pancuronium, pethidine, piperacillin-tazobactam (EDTA-free), potassium chloride, ranitidine, remifentanyl, sodium nitroprusside, streptokinase, tigecycline, tirofiban, vecuronium, verapamil, zidovudine.</p>
<b>Incompatibility</b>	<p>Fluids: Sodium bicarbonate and other alkaline solutions.</p> <p>Y-site: Aciclovir, alteplase, ampicillin, azathioprine, cephazolin, chloramphenicol, esomeprazole, ganciclovir, indomethacin, insulin (short-acting), sodium bicarbonate, thiopentone.</p>
<b>Stability</b>	<p>Ampoule: Store below 30°C. Protect from light.</p> <p>Diluted solution: Stable for 24 hours below 25°C.</p>
<b>Storage</b>	<p>Store below 25°C</p> <p>Protect from light.</p> <p>Discard remainder after use.</p>
<b>Excipients</b>	
<b>Special comments</b>	<p>Ensure dopamine has a "dedicated" line to avoid accidental bolus. Do not use as a side line with maintenance fluids.</p> <p>Discard admixtures exhibiting colour change.</p>
<b>Evidence</b>	<p><b>Efficacy:</b></p> <p>Treatment of hypotension in preterm infants: Dopamine is more effective than dobutamine at increasing blood pressure in hypotensive infants but this may not change clinical outcome. (LOE I, GOR C)<sup>3</sup>.</p> <p>Dose response is variable with considerable inter-individual variability in blood pressure response reported by studies.</p> <p>Limited data suggest higher dose dopamine may reduce cardiac output. (LOE II, GOR C)<sup>2,4</sup>.</p> <p>Dopamine to prevent renal dysfunction in indomethacin-treated preterm newborn infants: Dopamine improved urine output but there was no evidence of effect on serum creatinine, incidence of oliguria or frequency of failure to close the ductus arteriosus. (LOE I, GOR B)<sup>5</sup>.</p> <p>Vasopressors for hypotensive shock (newborns excluded): There is no difference in mortality between noradrenaline and dopamine.</p> <p><b>Safety:</b> Dopamine increased the risk for arrhythmia. There is not sufficient evidence that any one of the investigated 6 vasopressors is clearly superior over others for treatment of hypotensive shock. (LOE I, GOR B)<sup>6</sup>. There is insufficient safety data in neonates for use at doses &gt; 20 micrograms/kg/min.</p> <p><b>Pharmacokinetics:</b> Steady-state plasma dopamine concentrations and plasma clearance rates were observed within 20 minutes (dose range 1–8 microgram/kg/min). Linear correlation between infusion rate and plasma dopamine concentration. Threshold for increases in mean arterial pressure was 50% below that for increases in heart rate<sup>7</sup>.</p>
<b>Practice points</b>	
<b>References</b>	<ol style="list-style-type: none"> <li>Seri, I., Cardiovascular, renal, and endocrine actions of dopamine in neonates and children. <i>J Pediatr</i>, 1995. 126(3): p. 333–44.</li> <li>Osborn, D., N. Evans, and M. Kluckow, Randomized trial of dobutamine versus dopamine in preterm infants with low systemic blood flow. <i>J Pediatr</i>, 2002. 140(2): p. 183–91.</li> <li>Subhedar, N.V. and N.J. Shaw, Dopamine versus dobutamine for hypotensive preterm infants. <i>Cochrane Database Syst Rev</i>, 2003(3): p. CD001242.</li> <li>Roze, J.C., et al., Response to dobutamine and dopamine in the hypotensive very preterm infant. <i>Arch Dis Child</i>, 1993. 69(1 Spec No): p. 59–63.</li> <li>Barrington, K. and L.P. Brion, Dopamine versus no treatment to prevent renal dysfunction in indomethacin-treated preterm newborn infants. <i>Cochrane Database Syst Rev</i>, 2002(3): p. CD003213.</li> <li>Havel, C., et al., Vasopressors for hypotensive shock. <i>Cochrane Database Syst Rev</i>, 2011(5): p. CD003709.</li> <li>Padbury, J.F., et al., Dopamine pharmacokinetics in critically ill newborn infants. <i>J Pediatr</i>, 1987. 110(2): p. 293–8</li> <li>Young TE, Mangum B [2008]. <i>Neofax: A manual of drugs used in neonatal care</i>. Acorn Publishing, Inc.</li> </ol>

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