<table>
<tr><td>Alert</td><td></td></tr>
<tr><td>Indication</td><td>Treatment of hypotension. May also be used to improve renal perfusion.</td></tr>
<tr><td>Action</td><td>Catecholamine with alpha and beta adrenergic, dopaminergic and serotoninergic actions
Haemodynamic effects are dose dependent:[1]
•Low dose 1 to 5 microgram/kg/min – increases renal blood flow and glomerular filtration rate.
•Intermediate dose 5 to 10 microgram/kg/min – increases cardiac output and blood pressure. Increases renal blood flow.
•High dose 10 to 20 microgram/kg/min – systemic vasoconstrictor effect outweighs all other effects[2]. Reduces renal blood flow[1].</td></tr>
<tr><td>Drug Type</td><td>Inotropic vasopressor.</td></tr>
<tr><td>Trade Name</td><td>Dopamine concentrate DBL</td></tr>
<tr><td>Presentation</td><td>200 mg/5 mL</td></tr>
<tr><td>Dosage/Interval</td><td>1–20 microgram/kg/minute</td></tr>
<tr><td>Maximum daily dose</td><td>Use doses 10–20 microgram/kg/minute with caution.</td></tr>
<tr><td>Route</td><td>Continuous IV infusion.</td></tr>
<tr><td>Preparation/Dilution</td><td>SINGLE STRENGTH continuous IV infusion
<table>
<tr><th>Infusion strength</th><th>Prescribed amount</th></tr>
<tr><td>1 mL/hour = 10 microgram/kg/minute</td><td>30 mg/kg dopamine and make up to 50 mL</td></tr>
</table>
Draw up 0.75 mL/kg (30 mg/kg) of dopamine and add glucose 5% or sodium chloride 0.9% to make a final volume of 50 mL. Infusing at a rate of 1 mL/hour = 10 microgram/kg/minute.

DOUBLE STRENGTH continuous IV infusion
<table>
<tr><th>Infusion strength</th><th>Prescribed amount</th></tr>
<tr><td>1 mL/hour = 20 microgram/kg/minute</td><td>60 mg/kg dopamine and make up to 50 mL</td></tr>
</table>
Draw up 1.5 mL/kg (60 mg/kg) of dopamine and add glucose 5% or sodium chloride 0.9% to make a final volume of 50 mL. Infusing at a rate of 1 mL/hour = 20 microgram/kg/minute.

QUARDRUPLE STRENGTH continuous IV infusion
<table>
<tr><th>Infusion strength</th><th>Prescribed amount</th></tr>
<tr><td>1 mL/hour = 40 microgram/kg/minute</td><td>120 mg/kg dopamine and make up to 50 mL</td></tr>
</table>
Draw up 3 mL/kg (120 mg/kg) of dopamine and add glucose 5% or sodium chloride 0.9% to make a final volume of 50 mL. Infusing at a rate of 1 mL/hour = 40 microgram/kg/minute.</td></tr>
<tr><td>Administration</td><td>Continuous intravenous infusion via a central line. Use with caution via a peripheral line.</td></tr>
<tr><td>Monitoring</td><td>Continuous heart rate, ECG and blood pressure monitoring preferable.
Assess urine output and peripheral perfusion frequently.
Observe IV site closely for blanching and extravasation.</td></tr>
<tr><td>Contraindications</td><td>Arrhythmia and tachyarrhythmia.</td></tr>
</table>

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Precautions	Ensure adequate circulating blood volume prior to commencement. May increase pulmonary pressures.
Drug Interactions	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.
Adverse Reactions	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.
Compatibility	Fluids: Glucose 5%, glucose 10%, glucose in sodium chloride solutions, glucose 5% in Hartmann's, Hartmann's, mannitol 20%, sodium chloride 0.9% 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, remifentanil, sodium nitroprusside, streptokinase, tigecycline, tirofiban, vecuronium, verapamil, zidovudine.
Incompatibility	Fluids: Sodium bicarbonate and other alkaline solutions. Y-site: Aciclovir, alteplase, ampicillin, azathioprine, cephazolin, chloramphenicol, esomeprazole, ganciclovir, indomethacin, insulin (short-acting), sodium bicarbonate, thiopentone.
Stability	Ampoule: Store below 30°C. Protect from light. Diluted solution: Stable for 24 hours below 25°C
Storage	Store below 25°C Protect from light. Discard remainder after use
Special Comments	Ensure dopamine has a "dedicated" line to avoid accidental bolus. Do not use as a side line with maintenance fluids. Discard admixtures exhibiting colour change.
Evidence summary	Efficacy: 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)[3]. Dose response is variable with considerable inter-individual variability in blood pressure response reported by studies. Limited data suggest higher dose dopamine may reduce cardiac output. (LOE II, GOR C)[2,4]. 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.

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	(LOE I, GOR B)[5]. Vasopressors for hypotensive shock (newborns excluded): There is no difference in mortality between noradrenaline and dopamine. Safety: 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)[6]. There is insufficient safety data in neonates for use at doses > 20 micrograms/kg/min. Pharmacokinetics: 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[7].
References	1. Seri, I., Cardiovascular, renal, and endocrine actions of dopamine in neonates and children. J Pediatr, 1995. 126(3): p. 333–44. 2. Osborn, D., N. Evans, and M. Kluckow, Randomized trial of dobutamine versus dopamine in preterm infants with low systemic blood flow. J Pediatr, 2002. 140(2): p. 183–91. 3. Subhedar, N.V. and N.J. Shaw, Dopamine versus dobutamine for hypotensive preterm infants. Cochrane Database Syst Rev, 2003(3): p. CD001242. 4. Roze, J.C., et al., Response to dobutamine and dopamine in the hypotensive very preterm infant. Arch Dis Child, 1993. 69(1 Spec No): p. 59–63. 5. Barrington, K. and L.P. Brion, Dopamine versus no treatment to prevent renal dysfunction in indomethacin-treated preterm newborn infants. Cochrane Database Syst Rev, 2002(3): p. CD003213. 6. Havel, C., et al., Vasopressors for hypotensive shock. Cochrane Database Syst Rev, 2011(5): p. CD003709. 7. Padbury, J.F., et al., Dopamine pharmacokinetics in critically ill newborn infants. J Pediatr, 1987. 110(2): p. 293–8 8. Young TE, Mangum B [2008]. Neofax: A manual of drugs used in neonatal care. Acorn Publishing, Inc. Raleigh, NC 27619 9. Australian Injectable Drugs Handbook, 6th Edition, Society of Hospital Pharmacists of Australia 2014

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