DOPAMINE

DESCRIPTION Naturally occurring precursor of noradrenaline. It has specific dopaminergic action in addition to alpha and beta adrenergic effects. It is generally accepted that the inotropic and peripheral vasoconstrictor effects of dopamine predominate in the newborn period, although there is considerable controversy surrounding the existence of any vasodilator effects in renal, coronary and cerebral circulations. There is no evidence of a significant difference between dopamine and dobutamine in terms of left ventricular output, tachycardia, neonatal mortality, incidence of periventricular leukomalacia or severe periventricular haemorrhage. Dopamine was more successful than dobutamine in treating systemic hypotension, with fewer infants having treatment failure.

USE To treat systemic hypotension. Also used as a renal vasodilator.

PHARMACOKINETICS Onset of action is 2-4 minutes. Half-life is 2 minutes. Rapidly metabolised in the liver, kidneys and plasma. Metabolites excreted via the kidneys. There can be wide variations in plasma concentrations between individuals for a given dose of dopamine. This is likely to be related to differences in plasma clearance rates which are independent of birthweight and gestational age. In addition, there is a poor correlation between plasma dopamine concentration and blood pressure response.

PRESENTATION 200mg/5ml vial

DOSE 2-20mcg/kg/min depending on the desired action

LOW DOSE 2-4mcg/kg/minute acts directly on dopaminergic receptors to produce renal and mesenteric vasodilation. Increases urine output and sodium excretion. Decreases peripheral vascular resistance. For a diuretic effect, 2mcg is as good as 4mcg dose.

INTERMEDIATE DOSE 5-10mcg/kg/minute β1-adrenergic effects become prominent, resulting in an increase in myocardial contractility, heart rate, cardiac output and possibly an increase in blood pressure (mainly systolic). Also increases renal blood flow.

HIGH DOSE 10-20mcg/kg/minute stimulates α-adrenergic receptors. Increases peripheral and possibly pulmonary vascular resistance. Increases myocardial contractility, blood pressure (mainly systolic), and heart rate. May cause renal vasoconstriction and reduce renal perfusion.

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<tr>
<th>Infusion strength</th>
<th>Prescribed amount</th>
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<td>1ml/hr=20mcg/kg/min</td>
<td>60mg/kg Dopamine to make a 50ml solution</td>
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RECONSTITUTION Add prescribed amount to 5% or 10% dextrose to make a total of 50ml solution.

ADMINISTRATION Continuous IV infusion only!

DOPAMINE SHOULD ALWAYS HAVE ITS OWN LINE AND NOT BE MIXED WITH ANYTHING TO AVOID ACCIDENTAL BOLUS.

STORAGE Discard unused portion.

MONITORING Continuous cardio-respiratory and intraarterial blood pressure monitoring is preferable. Observe IV site closely for blanching and extravasation.
DOPAMINE  cont

ADVERSE EFFECT

1. Tachycardia and arrhythmias. May increase pulmonary artery pressure.
2. Tissue sloughing may occur with IV infiltration. **Suggested treatment:** Inject a 1mg/ml solution of phentolamine into the affected area. The usual amount needed is 1-5 ml depending on the size of the infiltrate.

PRECAUTION

IV administration of phenytoin to patients receiving dopamine may result in severe hypotension and bradycardia. **Use with extreme caution.**

SOLUTION COMPATIBILITY  5%dextrose, 10%dextrose, 0.9%sodium chloride

INCOMPATIBILITY  acyclovir, amphotericin B, furosemide, indomethacin, insulin and sodium bicarbonate

TERMINAL INJECTION SITE COMPATIBILITY  dextrose, amino acid and fat emulsion, aminophylline, ampicillin, amiodarone, caffeine, calcium chloride, chloramphenicol, dobutamine, epinephrine, fluconazole, gentamicin, heparin, hydrocortisone, lidocaine, meropenem, metronidazole, midazolam, morphine, oxacillin, pancuronium, penicillin G, potassium chloride, PGE1, propofol, ranitidine, tobramycin, vecuronium.

REFERENCE