# DOPAMINE

## Indication
- Treatment of hypotension, severe sepsis and septic shock\(^1\)
- Augmentation of cardiac output and renal blood flow\(^2\)

## Presentation
- Ampoule 200 mg in 5 mL

## Dosage
**Low dose action**
- 1–4 microgram/kg/minute\(^3\)

**Blood pressure**
- 5–20 microgram/kg/minute\(^2,4\)
  - Commence at 10 microgram/kg/minute\(^3\)
  - May be effective at 5 microgram/kg/minute for premature infants\(^3\)
  - Titrate according to response\(^2\)

## Special considerations
- Correct hypovolaemia prior to commencement\(^1\)
- Infusions may be prescribed as single, double, quadruple or greater strength
  - Maximum concentration 6 mg/mL\(^5\)
  - Low-stiction syringe recommended, but do not withhold treatment if unavailable
- Infuse via CVL, UVC or large peripheral vein\(^2\)
  - Use a dedicated IV line or Y site to avoid accidental bolus\(^5\)
  - Do not flush the IV line
- Do not cease abruptly (reduce dose gradually\(^5\))

## Monitoring
- Consider baseline echocardiogram (may assist in determining most appropriate inotrope or vasopressor)
- Continuous ECG\(^5\), arterial BP\(^2\)
- Urine output, peripheral perfusion\(^2\)
- Extravasation risk: can cause necrosis\(^5\)

## Compatibility
**Fluids**
- 5% glucose\(^5\), 10% glucose\(^6\), 0.9% sodium chloride\(^5\)
- Y-site
  - Adrenaline (epinephrine)\(^5\), amiodarone\(^5\), caffeine\(^5\), ciprofloxacin\(^5\), dobutamine\(^5\), esmolol\(^5\), fentanyl\(^5\), fluconazole\(^5\), glyceryl trinitrate\(^5\), heparin\(^5\), hydrocortisone\(^5\), lidocaine (lignocaine)\(^5\), methylprednisolone\(^5\), metronidazole\(^5\), midazolam\(^5\), milrinone\(^5\), morphine\(^5\), noradrenaline (norepinephrine)\(^5\), piperacillin-tazobactam\(^5\), potassium chloride\(^5\), ranitidine\(^5\), sodium nitroprusside\(^5\), vecuronium\(^5\), verapamil\(^5\), zidovudine\(^5\)

**Incompatibility**
- Sodium bicarbonate or other alkaline solutions\(^5\)
- Drugs
  - Aciclovir\(^5\), ampicillin\(^5\), cefazolin\(^5\), esomeprazole\(^5\), insulin-(short-acting)\(^5\), indomethacin\(^5\), sodium bicarbonate\(^5\)

## Injections
- Concurrent use of:
  - Phenytoin may result in hypotension and/or cardiac arrest\(^7\)
  - Digoxin may result in an increased risk of cardiotoxicity (arrhythmias)\(^7\)
  - Vasodilators (e.g. glyceryl trinitrate and sodium nitroprusside) may result in hypotension\(^7\)
Stability

- Ampoule
  - Store below 30 °C. Protect from light
  - Use only if solution clear colourless to pale yellow
- Infusion solution
  - Stable for 24 hours below 25 °C

Side effects

- Circulatory: tachycardia, abnormal ventricular conduction, vasoconstriction, hypotension or hypertension, arrhythmias
- Digestive: vomiting
- Endocrine: reversible suppression of thyrotropin secretion
- Immune: allergic reaction
- Nervous: mydriasis, piloerection
- Respiratory: dyspnoea
- Urinary: polyuria

Actions

- Stimulates dopamine receptors; is an alpha and beta and serotonin agonist. Varying effects at different doses
- Low doses (1–4 microgram/kg/minute)
  - Increases renal blood flow and glomerular filtration rate
- Intermediate doses (5–10 microgram/kg/minute)
  - Increases cardiac output, blood pressure and renal blood flow
- High doses (10–20 microgram/kg/minute)
  - Systemic vasoconstriction

Abbreviations

- BP: blood pressure,
- CVL: central venous line,
- ECG: electrocardiogram,
- IV: intravenous,
- UVC: umbilical venous catheter

Keywords
dopamine, vasopressor, hypotension, inotrope, blood pressure, BP

Quick Guide: dopamine infusion concentrations

<table>
<thead>
<tr>
<th>Draw up dopamine dose (mg/kg)</th>
<th>Make up to total volume (mL)</th>
<th>Infusion rate (mL/hour)</th>
<th>Delivers (microgram/kg/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 mg/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>10 microgram/kg/minute</td>
</tr>
<tr>
<td>60 mg/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>20 microgram/kg/minute</td>
</tr>
<tr>
<td>120 mg/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>40 microgram/kg/minute</td>
</tr>
</tbody>
</table>

The Queensland Clinical Guideline *Neonatal Medicines* is integral to and should be read in conjunction with this monograph. Refer to the disclaimer. Destroy all printed copies of this monograph after use.

References

## Document history

<table>
<thead>
<tr>
<th>ID number</th>
<th>Effective</th>
<th>Review</th>
<th>Summary of updates</th>
</tr>
</thead>
</table>