Approved by Quality & Patient Care Committee
17 May 2018

DOPAMINE HYDROCHLORIDE

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

1. AIM

- To safely prescribe and administer intravenous dopamine.

2. PATIENT

- Woman requiring treatment of:
    - Hypotension/ haemodynamic compromise due to myocardial infarction, trauma, sepsis or congestive cardiac failure.
    - Persistent hypotension after correction of hypovoleamia.
    - Increase mesenteric blood flow in mesenteric ischaemia.
    - Oliguria secondary to renal blood flow impairment.

3. STAFF

- Medical, midwifery and nursing staff

4. EQUIPMENT

- Dopamine 200 mg/5 mL ampoule

5. CLINICAL PRACTICE

Dosing varies depending on the desired effect. Dopamine stimulates alpha, beta and dopaminergic receptors to have differing effects on renal, cardiac or venous vasculature.

- **Low Dose** 2-5 microgram/kg/minute
  Dopamine receptors may be selectively activated to stimulate renal and mesenteric vasodilation increasing urine output and sodium excretion. Blood pressure does not change.
- **Medium Dose** 5-10microgram/kg/minute
  β1 receptors are activated and cardiac output and systolic blood pressure increase.
- **High Dose** >10 microgram/kg/minute
  α receptors are activated causing vasoconstriction and both systolic and diastolic blood pressure increase.

Prescribing

- Prescribe dopamine according to patient's weight. See attached chart for rates of infusion and calculation.
- Order dopamine on a NSW Health Fluid Order Chart. Include strength, fluid infusion rate (mL/hour) and the corresponding drug infusion rate (microgram/kg/minute).
- Document minimum and maximum rates for titration and MAP parameters. Inform nursing staff to titrate to effect as per prescribed therapeutic end points.
- Insert an arterial line for accurate BP recordings.

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DOPAMINE HYDROCHLORIDE cont'd

Administration

- Dilute dopamine 200 mg into sodium chloride 0.9% 100 mL to provide a 2 mg/mL (2000 microgram/mL) solution.
- Administer into a large vein via a central venous line as extravasation can result in tissue necrosis. NB A peripheral line may be used for short periods until central venous access is available.
- Administer diluted dopamine solution by an infusion pump in order to prevent an inadvertent bolus or flush of infusate.
- Avoid co- infusing with variable rate infusions. Use a dedicated IV line and clearly label the line, ie do not administer other drugs through the same line.
- Change the infusion bag after 24 hours.

Observations

- Continuous haemodynamic observation. ECG and oxygen saturation monitoring is required.
- Five minutely blood pressure recordings until set parameters have been met then hourly observations.
- Hourly urine measures are required with an accurate recording of fluid input.

6. DOCUMENTATION

- Integrated Clinical Notes
- Medication Chart
- Observation Chart
- NSW Health Fluid Order chart

7. EDUCATIONAL NOTES

Dopamine onset of action is five minutes and half-life is two minutes.

Adverse Effects

- Arrhythmias/ tachycardia
- Headache
- Vasoconstriction/ renal failure
- Nausea/ Vomiting
- May cause hypotension if incorrectly used.

Precautions

- Patients taking monoamine oxidase inhibitors or who have taken them in the last two weeks require a substantially reduced dose.
- Hypovoleamia should be fully corrected prior treatment with dopamine.
- Patients with pre-existing peripheral vascular disease may be more susceptible to peripheral ischaemia due to vasoconstriction. Ischaemia may be reversed by decreasing the rate or discontinuation of the infusion or by intravenous administration of phentolamine.
- Care with ischaemic heart disease patients, as it may exacerbate ischaemia.
- **Pregnancy**- category; B3.
- **Breastfeeding**-dopamine is not recommended for breastfeeding mothers unless the expected benefits outweigh any potential risks.
- Extravasation can cause tissue necrosis when administered peripherally

DOPAMINE HYDROCHLORIDE cont'd

8. RELATED POLICIES / PROCEDURES / CLINICAL PRACTICE LOP

- Medication- Administration
- Labelling of injectable medicines, lines, fluids

9. RISK RATING

- High

10. NATIONAL STANDARD

- Medication Safety

11. REFERENCES

POWH policy on administration of Dopamine Hydrochloride.
MIMS online accessed via CIAP on 29/2/16
Australian Injectable Drugs Handbook, 6th Edition, Society of Hospital Pharmacists of Australia 2015.

REVISION & APPROVAL HISTORY

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FOR REVIEW : MAY 2020

FLOW RATE (ML/HOUR) OF DOPAMINE

Below calculations based on: Dopamine 200mg in 100mL sodium chloride 0.9% IV solution.

DOSAGE MICROGRAM/KG/MIN	WEIGHT OF PATIENT (KG)										
	40	45	50	55	60	65	70	75	80	85	90
2.5	3	3.4	3.8	4.1	4.5	4.9	5.3	5.6	6	6.4	6.8
5	6	6.8	7.5	8.3	9	9.8	10.5	11.3	12	12.8	13.5
7.5	9	10.1	11.3	12.4	13.5	14.6	15.8	16.9	18	19.1	20.3
10	12	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27
15	18	20.3	22.5	24.8	27	29.3	31.5	33.8	36	38.3	40.5
20	24	27	30	33	36	39	42	45	48	51	54

Calculation example:
Patient prescribed: 5microgram/kg/minute
Patient weight: 70kg
Dilution: 200mg in 100mL

$$\text{Rate} = \frac{\text{Dose (microgram)} \times \text{Pt weight (kg)} \times 60}{\text{min} \times \text{volume (mL)}}$$

$$\text{Rate (mL/hour)} = \frac{5 \times 70 \times 60 \times 100}{1000 \times 200}$$

$$= 10.5 \text{ mL/hour}$$