

## DOPAMINE

### ACTION and USES

This agent has a dose dependent action on the systemic vascular tone. Low doses improve tissue perfusion and are used to treat oliguria on this unit. Larger doses increase blood pressure by increasing vascular tone and are used to treat hypotension and shock.

### DOSAGE

- 5 - 20 micrograms/kg/minute to treat hypotension and shock
- 3 micrograms/kg/minute to treat oliguria
- The dose and rate of administration must be stated on the prescription

### ADMINISTRATION

By continuous infusion of a diluted solution. NEVER give undiluted

### RECONSTITUTION

Dopamine Injection is available as a solution containing 40mg/ml in a 5ml ampoule

- Reconstitution is not necessary but it must be diluted

#### Standard Strength Dilution

- 10 microgram/kg/min is provided at 1ml/hr
- Add 30mg/kg (i.e. 0.75ml/kg of Dopamine Injection 40mg/ml) to a 50ml syringe and make up to a final volume of 50ml with glucose 5%.
- At this concentration the rate of infusion is calculated by the following formula

$$\text{Rate(ml / hr)} = 0.1 \times \text{dose(micrograms/ kg / minute)}$$

See explanation of formula and examples.

If the patient is fluid restricted Dopamine may be prescribed as a double strength solution which must be clearly stated on the prescription

#### Double Strength Dilution

**You must write "Double strength" and the unit concentration on the IV administration record under "Concentration" columns.**

- 20 microgram/kg/min is provided at 1ml/hr
- Add 60mg/kg (i.e. 1.5ml/kg of Dopamine Injection 40mg/ml) to a 50ml syringe and make up to a final volume of 50ml with glucose 5%
- At this concentration the rate of infusion is calculated by the following formula

$$\text{Rate(ml / hr)} = 0.05 \times \text{dose(micrograms/ kg / minute)}$$

See explanation of formula and example.

#### Other compatible diluents

- glucose 10%
- Sodium Chloride 0.9%

## INCOMPATIBILITIES

Do not mix or infuse with

- Sodium bicarbonate
- Furosemide
- Phenytoin

## STORAGE

- Opened ampoules should be discarded immediately after opening
- Do not store diluted solutions
- The unopened ampoules are stored in the drug cupboard.

## MONITORING

Neonates receiving dopamine will be intensively monitored for cardiovascular and renal parameters. Nausea, vomiting, peripheral vasoconstriction, hypotension, hypertension and tachycardia are frequent adverse effects. If extravasation occurs prompt infiltration of saline and phentolamine should be performed. Hypersensitivity reactions may occur.

### Explanation of formula

**Standard strength dilution** is based on the premise that a dose of 10 micrograms/kg/min will be given if the infusion rate is 1ml/hr, irrespective of body weight, if dopamine 40mg/ml is diluted to 30mg/kg/50ml (600 microgram/kg/ml).

Therefore: 10 micrograms/kg/min  
 = 600 micrograms/kg/hr (multiplied by 60 minutes)  
 = 600 micrograms/kg in 1ml (chosen rate = 1ml/hr)  
 = 30,000 micrograms/kg in 50ml (multiplied by 50)  
 = 30mg/kg in 50ml which is the same concentration as 600 micrograms/kg/ml

**Double strength dilution** is based on the premise that a dose of 20 micrograms/kg/min will be given if the infusion rate is 1ml/hr irrespective of body weight if dopamine 40mg/ml is diluted to 60mg/kg/50ml (1.2mg/kg/ml).

Therefore: 20 micrograms/kg/min  
 = 1200 micrograms/kg/hour (multiplied by 60)  
 = 1200 micrograms/kg in 1ml (rate 1ml/hr)  
 = 60,000 micrograms/kg in 50ml (multiplied by 50)  
 = 60mg/kg in 50ml

### Examples

**Example 1:** Standard strength (30mg/kg/50ml) 10 microgram/kg/min is provided at 1ml/hr

Infant weighs = 2.9kg

30mg/kg = 0.75ml/kg of dopamine injection (40mg/ml)

For a 2.9kg infant =  $2.9 \times 0.75 = 2.175$  (rounded up to 2.2ml)

Add 2.2ml Dopamine injection plus 47.8ml of glucose 5% (ie 50ml)

To administer 10micrograms/kg/min

Rate of infusion = 1ml/hr

To administer 12 micrograms/kg/min

Rate of infusion = 1.2ml/hr

**Example 2:** Standard strength (30mg/kg/50ml) 10 microgram/kg/min is provided at 1ml/hr

Infant weighs = 1.6kg

30mg/kg = 0.75ml/kg of Dopamine injection (40mg/ml)

For a 1.6kg infant =  $1.6 \times 0.75 = 1.2\text{ml}$

Add 1.2ml Dopamine injection plus 48.8ml of glucose 5% (i.e. 50ml)

To administer 10 micrograms/kg/min

Rate of infusion = 1ml/hr

To administer 8 micrograms/kg/min

Rate of infusion = 0.8ml/hr

**Example 3:** Double strength (60mg/kg/50ml) 20 microgram/kg/min is provided at 1ml/hr

Infant weighs = 2.9kg

60mg/kg = 1.5ml/kg of Dopamine injection (40mg/ml)

For a 2.9 kg infant =  $2.9 \times 1.5 = 4.35\text{ml}$  (rounded up to 4.4ml)

Add 4.4ml of Dopamine injection plus 45.6ml of glucose 5% (i.e. 50ml)

To administer 10 micrograms/kg/min

Rate of Infusion = 0.5ml/hr

To administer 12 micrograms/kg/min

Rate of Infusion = 0.6ml/hr