

## MIDAZOLAM

### ACTION and USES

A short acting benzodiazepine used for sedation of ventilated and unventilated infants and control of seizures. Is a sedative, not an analgesic agent.

### DOSAGE

**Give a bolus** of 150 micrograms/kg followed by a **continuous intravenous infusion** starting at 60 micrograms/kg/hour. This infusion **can be increased** by 60 micrograms/kg/hour up to a maximum infusion rate of 300 micrograms/kg/hour. These doses are applicable to all gestations and ages.

If being used for sedation **reduce dose** by 50% in babies who are already on morphine and adjust thereafter according to degree of sedation. This also applies in hypovolaemic, vasoconstricted and hypothermic babies.

**For short term use only** (Max treatment period <96 hours) in ventilated babies. **Wean dose slowly over 1-2 days.**

**Single IV bolus doses** of 100 micrograms/kg/dose may be used in patients who have not received any sedation. Great caution is appropriate if there is acute pulmonary insufficiency or respiratory depression.

### ADMINISTRATION

By continuous infusion. IV bolus over at least 5 minutes can be used.

### RECONSTITUTION

Midazolam is available in solution containing 5mg/ml. Reconstitution is not required. The injection can be used orally, to an appropriate diluted concentration immediately prior to use.

#### Midazolam 100microgram/ml (loading dose)

Add 0.2ml of midazolam 5mg/ml to 9.8ml of sodium chloride 0.9% (ie total volume 10ml) and shake well to mix.

#### Midazolam 100microgram/kg/ml

(equivalent to 100microgram/kg/hr at 1ml/hr)

Add 1ml/kg (5mg/kg) of midazolam 5mg/ml to a 50ml syringe and make up to final volume of 50ml with sodium chloride 0.9%. Shake well to mix. At this concentration the rate of infusion is calculated by the following formula

Rate (ml/hr) = 0.01 x prescribed dose (microgram/kg/hr)

see explanation and example

#### Other compatible diluent

glucose 5% infusion BP.

### INCOMPATIBILITIES

Do not mix or infuse with any other drug or diluent. Y-site compatibilities with fluconazole, morphine, pancuronium has been reported. It is incompatible with dexamethasone, furosemide, phenobarbital, erythromycin and sodium bicarbonate.

## STORAGE

Use immediately. Do not store diluted solutions. However, the final diluted solution is stable for 24 hours at room temperature. Store unopened ampoule at room temperature in IV medicine cupboard. The injection can be used orally and must be diluted prior to use, discard any remained thereafter.

## MONITORING

Monitor respiratory depression, heart rate and hypotension. Seizures or seizure like activity may occur after rapid IV bolus, therefore administer over at least 5 minutes. Observe liver function tests at least weekly. Withdrawal symptoms can occur after prolonged therapy (>72 hours). Safety of continuous infusion for .14 days is not known. Gastro-intestinal side effects include nausea and vomiting. The injection is painful and can cause thrombophlebitis.

## Explanation of formula

Final dilution is based on the premise that a dose of 100microgram/kg/hr can be provided by infusion rate of 1ml/hr irrespective of baby's weight providing midazolam is diluted to 5mg/kg/50ml (100microgram/kg/ml)

Note 1000nanogram = 1 microgram

Dose = 100microgram/kg/hr

Concentrated solution = 5mg/ml

Final diluted solution = 1ml of concentrated solution/kg to 50ml

= 5mg/kg/50ml

= 5000microgram/kg/50ml

= 100microgram/kg/ml

Infusion rate to give dose of 100microgram/kg/hr using final dilution of 100microgram/kg/ml

= Dosage / final concentration

= 100microgram/kg/hr / 100microgram/kg/ml

= 1ml/hr

## Example

Infant weight = 2.9Kg

Prescribed dose = 200microgram/kg/hr

5mg/kg/50ml = 1ml/kg/50ml using concentrated solution (5mg/ml)

For a 2.9kg infant  $= 1 \times 2.9 = 2.9$

Add 2.9ml of midazolam 5mg/ml to 47.1ml sodium chloride 0.9% (ie 50ml)

200microgram/kg/hr  $= 2\text{ml/hr}$