

**Reversal of sedative effects of benzodiazepines (if drowsiness recurs after injection)**

## ▶ BY INTRAVENOUS INFUSION

- ▶ Neonate: 2–10 micrograms/kg/hour, adjusted according to response.

- ▶ Child: 2–10 micrograms/kg/hour (max. per dose 400 micrograms/hour), adjusted according to response

**Reversal of sedative effects of benzodiazepines in intensive care**

## ▶ BY INTRAVENOUS INJECTION

- ▶ Child: 10 micrograms/kg every 1 minute (max. per dose 200 micrograms) if required, dose to be administered over 15 seconds; maximum 2 mg per course; maximum 50 micrograms/kg per course

- **UNLICENSED USE** Not licensed for use in children under 1 year. Not licensed for use by intravenous infusion in children. Not licensed for use in children in intensive care.

**IMPORTANT SAFETY INFORMATION**

Flumazenil should only be administered by, or under the direct supervision of, personnel experienced in its use.

- **CONTRA-INDICATIONS** Life-threatening condition (e.g. raised intracranial pressure, status epilepticus) controlled by benzodiazepines
- **CAUTIONS** Avoid rapid injection following major surgery · avoid rapid injection in high-risk or anxious patients · benzodiazepine dependence (may precipitate withdrawal symptoms) · children · ensure neuromuscular blockade cleared before giving · head injury (rapid reversal of benzodiazepine sedation may cause convulsions) · history of panic disorders (risk of recurrence) · prolonged benzodiazepine therapy for epilepsy (risk of convulsions) · short-acting (repeat doses may be necessary—benzodiazepine effects may persist for at least 24 hours)
- **SIDE-EFFECTS**
  - ▶ **Common or very common** Anxiety · diplopia · dry mouth · eye disorders · flushing · headache · hiccups · hyperhidrosis · hyperventilation · hypotension · insomnia · nausea · palpitations · paraesthesia · speech disorder · tremor · vertigo · vomiting
  - ▶ **Uncommon** Abnormal hearing · arrhythmias · chest pain · chills · cough · dyspnoea · nasal congestion · seizure (more common in patients with epilepsy)
  - ▶ **Frequency not known** Withdrawal syndrome
- **PREGNANCY** Not known to be harmful.
- **BREAST FEEDING** Avoid breast-feeding for 24 hours.
- **HEPATIC IMPAIRMENT** Manufacturer advises caution (risk of increased half-life).  
**Dose adjustments** Manufacturer advises cautious dose titration.
- **DIRECTIONS FOR ADMINISTRATION** For *continuous intravenous infusion*, dilute with Glucose 5% or Sodium Chloride 0.9%.

- **MEDICINAL FORMS** There can be variation in the licensing of different medicines containing the same drug.

**Solution for injection**▶ **Flumazenil (Non-proprietary)**

- ▶ **Flumazenil 100 microgram per 1 ml** Flumazenil 500micrograms/5ml solution for injection ampoules | 5 ampoule [PoM] £72.46 (Hospital only) | 5 ampoule [PoM] £65.50-£70.00 | 10 ampoule [PoM] £140.00

## 3.2 Digoxin toxicity

**ANTIDOTES AND CHELATORS** > **ANTIBODIES****Digoxin-specific antibody**● **INDICATIONS AND DOSE**

**Treatment of known or strongly suspected life-threatening digoxin toxicity associated with ventricular arrhythmias or bradyarrhythmias unresponsive to atropine and when measures beyond the withdrawal of digoxin and correction of any electrolyte abnormalities are considered necessary**

## ▶ BY INTRAVENOUS INFUSION

- ▶ Child: Serious cases of digoxin toxicity should be discussed with the National Poisons Information Service (consult product literature)

- **MEDICINAL FORMS** There can be variation in the licensing of different medicines containing the same drug.

**Powder for solution for infusion**▶ **DigiFab** (BTG International Ltd)

**Digoxin-specific antibody fragments 40 mg** DigiFab 40mg powder for solution for infusion vials | 1 vial [PoM] £750.00 (Hospital only)

## 3.3 Heparin toxicity

**ANTIDOTES AND CHELATORS****Protamine sulfate**● **INDICATIONS AND DOSE**

**Overdosage with intravenous injection or intravenous infusion of unfractionated heparin (less than 30 minutes lapsed since overdose)**

## ▶ BY INTRAVENOUS INJECTION

- ▶ Child: 1 mg (max. per dose 50 mg), to be administered at a rate not exceeding 5 mg/minute, to neutralise each 100 units of unfractionated heparin

**Overdosage with intravenous injection or intravenous infusion of unfractionated heparin (if 30–60 minutes lapsed since overdose)**

## ▶ BY INTRAVENOUS INJECTION

- ▶ Child: 500–750 micrograms (max. per dose 50 mg), to be administered at a rate not exceeding 5 mg/minute, to neutralise each 100 units of unfractionated heparin

**Overdosage with intravenous injection or intravenous infusion of unfractionated heparin (if 60–120 minutes lapsed since overdose)**

## ▶ BY INTRAVENOUS INJECTION

- ▶ Child: 375–500 micrograms (max. per dose 50 mg), to be administered at a rate not exceeding 5 mg/minute, to neutralise each 100 units of unfractionated heparin

**Overdosage with intravenous injection or intravenous infusion of unfractionated heparin (if over 120 minutes lapsed since overdose)**

## ▶ BY INTRAVENOUS INJECTION

- ▶ Child: 250–375 micrograms (max. per dose 50 mg), to be administered at a rate not exceeding 5 mg/minute, to neutralise each 100 units of unfractionated heparin

**Overdosage with subcutaneous injection of unfractionated heparin**

## ▶ BY INTRAVENOUS INJECTION, OR BY INTRAVENOUS INFUSION

- ▶ Child: (max. per dose 50 mg), 50–100% of the total dose to be given by intravenous injection (rate not exceeding 5 mg/minute), then give any remainder of dose by intravenous infusion over 8–16 hours, 1 mg neutralises approx. 100 units of unfractionated heparin