Mannitol Intravenous for Adults

Who can administer

May be administered by registered competent doctor or nurse/midwife

Important information

- **Crystallisation** may occur - see under 'storage requirements' for further information
- See 'Monitoring requirements' below
- **Flush line with Glucose 5%** as there is a risk of precipitation with Sodium chloride 0.9% (ref 1)
- Administer via central line or large peripheral vein
- **Extravasation** causes inflammation and thrombophlebitis

Available preparations

Mannitol 10% 500mL infusion (50g in 500mL)

Mannitol 15% 500mL infusion (75g in 500mL)

Mannitol 20% 500mL infusion (100g in 500mL) (this product may not be available- it has been discontinued by some manufacturers)

Reconstitution

Already in solution

Infusion fluids

Not required - product ready for infusion

Methods of intravenous administration

Slow intravenous injection (test dose for patients with marked oliguria or suspected inadequate renal function)

- **Test dose** over 3 to 5 minutes

Intermittent intravenous infusion

- See under 'dose' for details
- Administer via a giving set that incorporates a 15 micron **in-line filter** (ref 1) - check packaging of administration set for details)- see photo

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- The rate of infusion is usually adjusted to maintain a urine flow of at least 30 to 50mL/hour
- In emergency situations, the maximum infusion rate can be as high as 0.2g/kg over five minutes

Dose in adults

Volume in ml of Mannitol solution required							
	Required dose	**15g**	**25g**	**50g**	**75g**	**100g**	**150g**
10% solution		**150ml**	**250ml**	**500ml**	**750ml**	**1000ml**	**1500ml**
15% solution		**100ml**	**167ml**	**333ml**	**500ml**	**667ml**	**1000ml**
20% solution		**75ml**	**125ml**	**250ml**	**375ml**	**500ml**	**750ml**

Reduction of intracranial pressure, cerebral volume and intraocular pressure

- Usual dose: 1.5 to 2g/kg infused over 30 to 60 minutes (some references suggest a range of 0.25 to 2g/kg [ref 2])
- Dose may be repeated once or twice after 4 to 8 hours [ref 2]
- See table above for guidance on the different volumes of mannitol required (depending on concentration)
- When used pre-operatively, the dose should be administered 60 to 90 minutes before surgery to obtain the maximum effect

Use in patients with oliguria or renal impairment

- A test dose (to assess renal function) of about 0.2g per kg should be administered over three to five minutes - this should produce a diuresis of at least 30 to 50ml/hour during the next two to three hours
- A second test dose may be given if there is inadequate response to the first test dose
- See table above for guidance on the different volumes of mannitol required (depending on concentration)
- If the second test dose does not produce an adequate urine output, then need to reassess management

Acute renal failure

- The general dose range for adults is 50 to 200g mannitol in a 24 hour period, with a dosage limit of 50g mannitol on any one occasion
- In most instances, adequate response will be achieved at a dosage of 50 to 100g mannitol per day
- The rate of administration is usually adjusted to maintain a urine flow of at least 30 to 50mL/hour
- See table above for guidance on the different volumes of mannitol required (depending on concentration)

Promotion of elimination of renally excreted toxic substances in poisoning

- An initial loading dose of 25g may be given
- Adjust dose to maintain urinary output of at least 100ml/hour and positive fluid balance of 1 to 2 litres
- See table above for guidance on the different volumes of mannitol required (depending on concentration)

Renal impairment

- Use with caution in severe renal impairment
- If the second test dose does not produce adequate urine output, reassess options

Monitoring

- Renal function, fluid balance, serum electrolytes, serum and urine osmolality
- Monitor central venous pressure
- Assess cardiac function before and during treatment

Storage

- Store between 20 and 30^{0}C [ref 1]
- Do not refrigerate or freeze
- Solutions may crystallise, especially if stored at low temperatures
- The administration set should contain a **15 micron in-line filter** - see under method of administration above

Crystals may be redissolved by warming before use as follows:

- Re-dissolve any crystals by warming to 37^{0}C (Baxter products), or 60^{0}C (Fresenius Kabi products) [ref 1]
- Use of dry heat (eg warming cabinet) is recommended - solutions should not be heated in water due to risk of contamination
- Shake vigorously occasionally [ref 1]
- Microwave heating **should not be used**
- The product should be allowed to cool to 37^{0}C before infusion

References

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1. Injectable medicines administration guide, Medusa Accessed online 7th July 2023

2. BNF- accessed online 7th July 2023

Therapeutic classification

Osmotic diuretic