**Hypertonic 5% Saline***

**Indications**

*Osmotherapy for treatment of cerebral oedema and raised intracranial pressure (e.g. head injury, DKA)*

*Treatment of symptomatic hyponatraemic seizures.*

*‘Small volume’ resuscitation for shock (e.g. associated with traumatic head injury)*

**Mechanism of action**

*Hypertonic saline is as effective as mannitol for treatment of raised intracranial pressure in traumatic brain injury in children. Plasma sodium of up to 170mmol/L have been targeted to control ICP.*

*Hypertonic saline may produce less rebound intracranial hypertension following administration compared to mannitol which cannot easily be removed from. *Hypertonic saline does not cause obligatory osmotic diuresis and hence is likely to preserve or augment plasma volume rather than deplete it.*

*Mannitol may precipitate acute renal failure and may not be excreted in oligoanuria whereas hypertonic saline is renoprotective.*

*Hypertonic saline directly increases plasma Na. Measurable changes in blood can be easily monitored by measuring plasma Na. The effect of mannitol on plasma osmolality can only be estimated using an osmole gap.*

**Dose of 5% Saline**

*Standard dose is 5ml/kg of IVI 5% Saline, over 20 - 30 minutes preferably via central line, but can be given peripherally.*

*Dose may be repeated as clinically indicated according to the indication of use and plasma Na. Always check plasma Na prior to second and subsequent doses.*

*5mls/kg of 5% Saline may increase plasma Na by 3 – 5mmol/L. A greater increase may occasionally occur if a large diuresis occurs. Check plasma Na if any doubt on the rate of Na increase.*

*For hyponatraemic seizures there is no fixed threshold above which seizures stop, usually an increase of 3 to 7mmol/L is adequate.*
An acute rise in plasma sodium at a rate less than 10mmol/L in 24 hours is probably safe.\textsuperscript{4}

\textbf{Safety Considerations}

*For volumes <60mls do not connect the 500ml 5\% Saline polyfusor directly to the patient – draw the prescribed volume of 5\% Saline into a syringe and administer to patient via a syringe pump.
*For volumes >60mls administer to patient via a volumetric pump and SET VOLUME TO BE INFUSED accurately. As soon as volume administered disconnect 5\% Saline polyfusor from patient to avoid risk of accidental infusion.

\textbf{In case of accidental overdose of 5\% Saline:}

*Stop 5\% Saline infusion and inform Consultant IMMEDIATELY
*Give frusemide 1mg/kg to promote natriuresis – aim for 6ml/kg/hr. This may be sufficient to keep Na in safe range.
*Measure plasma Na every 30 – 60 minutes for trend. The indications for dialysis are anuria, oliguria or a rapid rise in Na > 5mmol/hr.
*DO NOT attempt to correct Na with free water or use 0.45\% Saline (risk of sudden drop in brain osmolality).

\textbf{References:}


*Modification of, but based on South Thames Retrieval Guidelines