

Management of Increased Intracranial Pressure with 23.4% Saline in the Adult Neurologically Injured Patient Population

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Background/Significance

- Hypertonic saline (HTS) is any concentration of sodium chloride higher than physiologic (0.9%)
- Hypertonic saline is used to achieve a state of hyperosmolarity
- By increasing serum sodium osmolality, HTS creates an osmotic gradient that pulls water from the intracellular compartments of the brain, reducing intracranial pressure (Froelich, Quanhong, Wess, Ougorets, & Hartl, 2009)
- It also leads to an increase in cerebral blood flow by reducing vascular resistance due to the decreased edema in the brain's vasculature (Froelich et al. 2009)

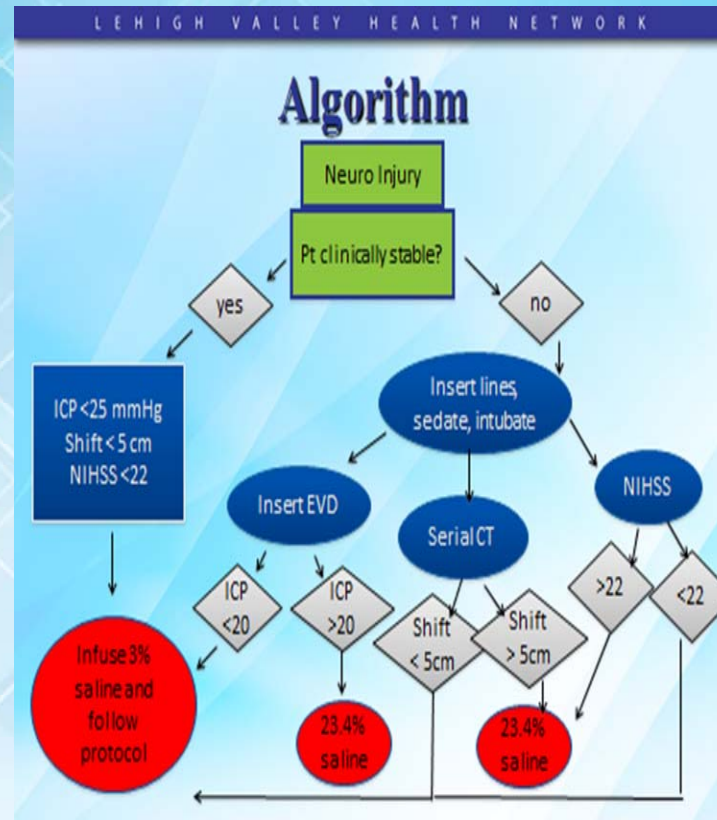
PICO Question

In the adult neurologically brain injured population is a bolus of 23.4% saline more efficacious than a continuous infusion of 3% NSS to reduce elevated intracranial pressure readings?

Process/Implementation

- Meet with NSICU physicians to create an algorithm for the use of 3% vs 23.4% saline
- Contacted pharmacy to obtain 23.4% HSS
- Submit algorithm and policy to administration for final approval
- Begin usage of 23.4% saline per physician order

Algorithm



Evidence

- Studies showed that with the use of a 23.4% saline bolus, the reduction in ICP from the baseline (within 6 hours after the bolus HTS treatment) was statistically significant; the mean reduction from baseline to follow-up values was 8.8 mm Hg (Paredes-Andrade et al. 2014)
- Treatment of refractory intracranial hypertension with 23.4% saline shows ICP was more than halved after the bolus administration (Bodel et al. 2013)
- A 30 ml bolus of 23.4% saline is the standard dose for emergent reduction of ICP (Kimberly & Sheth, 2011).
- HTS is associated with ICP reduction and reversal of transtentorial herniation (Stevens, Huff, Duckworth, Papangelou, Weingart, & Smith, 2012).

Dissemination

- Once 23.4% algorithm is approved, NSICU nurses will be educated on algorithm and the use of a bolus.
- Patient ICP readings will be monitored to evaluate the effectiveness of 23.4% saline boluses in rapidly reducing ICP.
- Hypertonic saline policy will be updated to include the use of 23.4% saline boluses in addition to a continuous infusion of 3% saline infusion

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