

Pediatric Trauma Management

Preoperative management

- Initial stabilization in ED or ICU is crucial.
- If there is no time for stabilization before surgery, discussion with surgeon regarding need for lines, invasive monitoring.
- NPO status: all trauma victims are considered high risk for aspiration regardless of NPO status. Time from oral intake to the injury is more important than actual NPO duration.

Intra-operative management

- Induction:
 - Assess hemodynamic stability.
 - If difficult airway is suspected -> inhalational induction to maintain spontaneous respiration.
 - If TBI then IV induction preferred due to favorable effects on CMRO₂ and ICP
 - Anticipate hypotension and possible cardiovascular collapse with induction -> adequate vascular access should be secured prior to induction.

Intra-operative management

- Induction agents:
 - Propofol:
 - Causes hypotension even in healthy normovolemic kids.
 - Reflex cerebral vasodilation occurs -> increased ICP.
 - Not the best choice.
 - Etomidate:
 - Maintains sympathetic outflow, maintains MAP and CPP.
 - Myocardial depressant effect is less than equipotent doses of propofol or ketamine.
 - Adrenal suppression with brief use is questionable.
 - Ketamine:
 - Cerebral vasodilation: increases ICP if used for induction.
 - Direct myocardial depression -> hypotension in critically ill pts.

Intra-operative management

- Anesthetic maintenance:
 - Stable pts: volatile/ relaxant/ opioid technique
 - Unstable pt: opioid/ relaxant.
 - TBI pts:
 - Sevoflurane has the advantage of maintaining cerebral auto-regulation up to 1.5 MAC.
 - Avoid excessive opioid boluses: decreases MAP and causes cerebral vasodilation.

Intra-operative management

- Monitoring:
 - A-line
 - CVP if major fluid shift anticipated.
 - Urine output.
 - ICP monitoring.
 - Temperature monitoring.
- May need to be started while emergent surgery is underway.

Intra-operative management

- Fluids and blood:
 - Crystalloids.
 - Hypertonic saline: less volume, less cerebral edema.
 - Colloids: avoid hetastarch (bleeding).
 - Blood: transfuse if EBL $>40\%$ of blood volume. Transfuse earlier if comorbidities are present or if rapid loss. O- blood in emergency.

Intra-operative management

- Blood products:
 - PRBCs: 20 ml/kg. Give calcium if rapid transfusion.
 - FFP: 10-15 ml/kg, if the whole blood volume has been replaced. For factor V and VIII deficiency.
 - Platelets: for dilutional thrombocytopenia and non surgical bleeding, 0.1 units/kg raises platelet count by 20,000.
 - Cryo: factor VIII and fibrinogen. For DIC, massive transfusion. 0.1 units/kg.