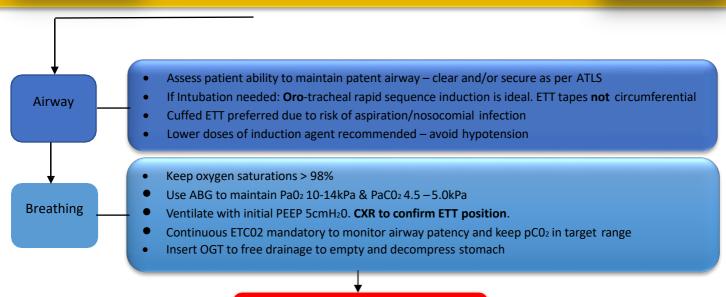


Guideline for Patients with Severe Traumatic Brain Injury (GCS ≤8)

Call PICU: 1800 222 378





- Out-rule ongoing haemorrhage as per ATLS
- Maintain minimum systolic BP ≥ [70mmHg + (age in years x2)] if 0-10yr & ≥90mmHg if >10yr old
- If Hypotensive/hypovolaemic 10-20ml/kg 0.9% NaCl as IV push reassess post bolus. Repeat x3
- If fluid resistant consider inotropes see full guideline. Noradrenaline is typically first line via good PIV if CVC unavailable

Priority Two

Maintain Haemodynamic stability

- IVF @ 100% maintenance for age—NaCl 0.9%. Add dextrose 5% if <1yr AND hypoglycaemic. Keep bld glucose >4mmol/L
- Maintain Hb >100g/L. FFP, platelets and tranexamic acid can be considered if blood loss significant or ongoing
- Catheterise to monitor U/O and avoid bladder distension.

Priority Three Neuroprotection

- Adequate sedation 1st line morphine load 100mcg/kg then infusion @ dose 20mcg/kg/hr (range 20-60mcg/kg/hr) AND midazolam load 50mcg/kg then infusion @ 2mcg/kg/min (range 1-5mcg/kg/min)
- Treat seizures as per APLS lorazepam 0.1mg/kg x2 then Levetiracetam load 40mg/kg IV over 20minutes (max 2.5gram)
- Maintain normothermia (36 36.5°C). Monitor **core** temp (rectal/oesophageal). Cool aggressively if hyperthermic >37°C
- If shivering occurs consider neuromuscular blockade (NMB).
- NMB will mask seizures but may be necessary to facilitate safe transfer. Ensure adequate sedation before paralysing
- Nurse with head in midline and head at 30° elevation if no C-spine precautions in place
- Perform non contrast CT brain and C spine when safe. Do not delay transfer for scan if head injury is obvious and timely
 CT unavailable discuss with neurosurgical team/PICU team if unsure

Priority Four Treatment of suspected raised ICP

- Suspect raised ICP if: Lateralising signs, pupillary dilatation, falling GCS, acute HR/BP changes, abnormal CT
- If clinical concern reassess priorities 1-3. Assess need to suction sedate for same. Use NBM if coughing
- Osmotic therapy –3% NaCl 5ml/kg OR mannitol 0.5gm/kg IV over 15- 20minutes can be repeated
- If ongoing concern: Third line therapies → 3-5min targeted fall in paCO2 of 1-2kpa prolonged use is harmful



• Intermittent/continuous NMB blockade

Time Critical Pre-Departure Checklist Child with Elevated ICP

To be completed by referring team prior to departure

Contact with the accepting PICU intensivist via 1800 222 378

For advice during transfer



Airway / Ventilation Considerations

Appropriate Sized ETT well secured with spare intubation set available		Blood gas (cap/ven/art) checked once on transport ventilator. Blood glucose reviewed.	
NGT inserted and attached to bile bag for drainage		ETCO ₂ in ventilation circuit and visible on transport monitor – targeting 4.5-5Kpa	
CXR performed and ETT & NGT position modified if required		Oxygen titrated to achieve 0 ₂ sats between 94-98% - avoid hypoxia AND hyperoxia	
Vent set to achieve 6-8ml/kg/min Tv + RR to keep $ETCO_2$ in target. PEEP typically set to $5cmH_2O$		Appropriately sized ETT suction catheters available (uncuffed ETT size $x2 = Catheter French$) i.e. 3.5 cuffed ETT has same internal diameter as a 4.0 uncuffed ETT \therefore (4 x 2) = 8 F suction catheter	
Patient in midline and elevated to 30° – 45° for transfer		Maintain normothermia – monitor core body temp	
Ci	rculation	Considerations	
		rought in addition to, and kept separate from, those suggested below	
Working Vascular Access x2 (IV/IO)		If patient already on Noradrenaline – discuss with PICU re additional inotrope to bring on transfer –	
Continuous ECG monitoring on transport monitor		likely Adrenaline/Vasopressin	
NIBP set to auto q3-5min if art line unavailable		Push dose pressors: (to correct hypotension) Choice & dose at discretion of medically responsible consultant. 1. Adrenaline 1:100,000	
Maintain minimum systolic BP ≥ 0-10yr = [70mmHg + (age in years x2)] >10yr old = ≥90mmHg		Add 1ml Adrenaline 1:1,000 to 99ml NS = 10mcg/ml solution (label clearly) Dose - 0.1ml/kg = 1mcg/kg per dose	
Rescue fluid available – 0.9% Saline		 Phenylephrine 100mcg/ml Dose - >1mo - 12yrs = 5-20mcg/kg Dose - >12yrs = 100-500mcg/kg 	
Noradrenaline infusion prepared and connected to patient (if in use dose range is 0.02mcg/kg/min to 0.2mcg/kg/min)		 Ephedrine diluted to conc. of 3mg/ml Dose – 1-12yr = 500mcg/kg Dose - >12yr = 3-7.5mg 	
Sedation / Neurosurgical Considerations			
Deep sedation required: <2yr or haemodynamically unstable Morphine 20-40mcg/kg/hr AND Midazolam 3-5mcg/kg/min		Suggested bolus CNS medications for transfer Use & dose at discretion of medically responsible consultant. Dose titration recommended if haemodynamically unstable	
>2yr and haemodynamically stable Propofol 3-5mg/kg/hr +/- Remifentanil 0.1 – 0.2mcg/kg/min		 Ketamine 0.5-2 mg/kg Rocuronium - 0.6-1.2 mg/kg Propofol 1-2 mg/kg Lorazepam Dose 0.1mg/kg max 4mg for seizures 	

5. Fentanyl 1-2mcg/kg



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IPATS
Irish Paediatric Acute
Transport Service

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The Irish Paediatric Acute Transport Service (IPATS) in conjunction has produced this clinical guideline with the Paediatric Intensive Care Unit and Neurosurgical Department, in Children's University Hospital, Temple Street. It has been designed for nurses, doctors and ambulance staff to refer to in the emergency care of critically ill children.

This guideline represents the views of IPATS and was produced after careful consideration of available evidence in conjunction with clinical expertise and experience. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.