

# Ascension St. Vincent adult severe traumatic brain injury guideline

**Purpose:** Utilization of best-practice guidelines to assist with the management of adult trauma patients who have sustained a severe traumatic brain injury.

**Scope:** Adult trauma patients who have suffered a severe traumatic brain injury.

## Inclusion/Exclusion Criteria:

- Inclusion:
  1. Abnormal CT scan with hematomas, swelling, herniation, compressed basal cistern, or diffuse axonal injury **and** either A or B below:
    - A. Traumatic brain injury (TBI) with GCS  $\leq$  8 (field, transport, or ED)
    - B. TBI patient admitted with GCS  $>$ 8, with deterioration to GCS  $\leq$  8
- Exclusion:
  1. Hypoxic ischemic injuries
  2. Patient that is deemed non-salvageable after discussion/agreement by clinical care team

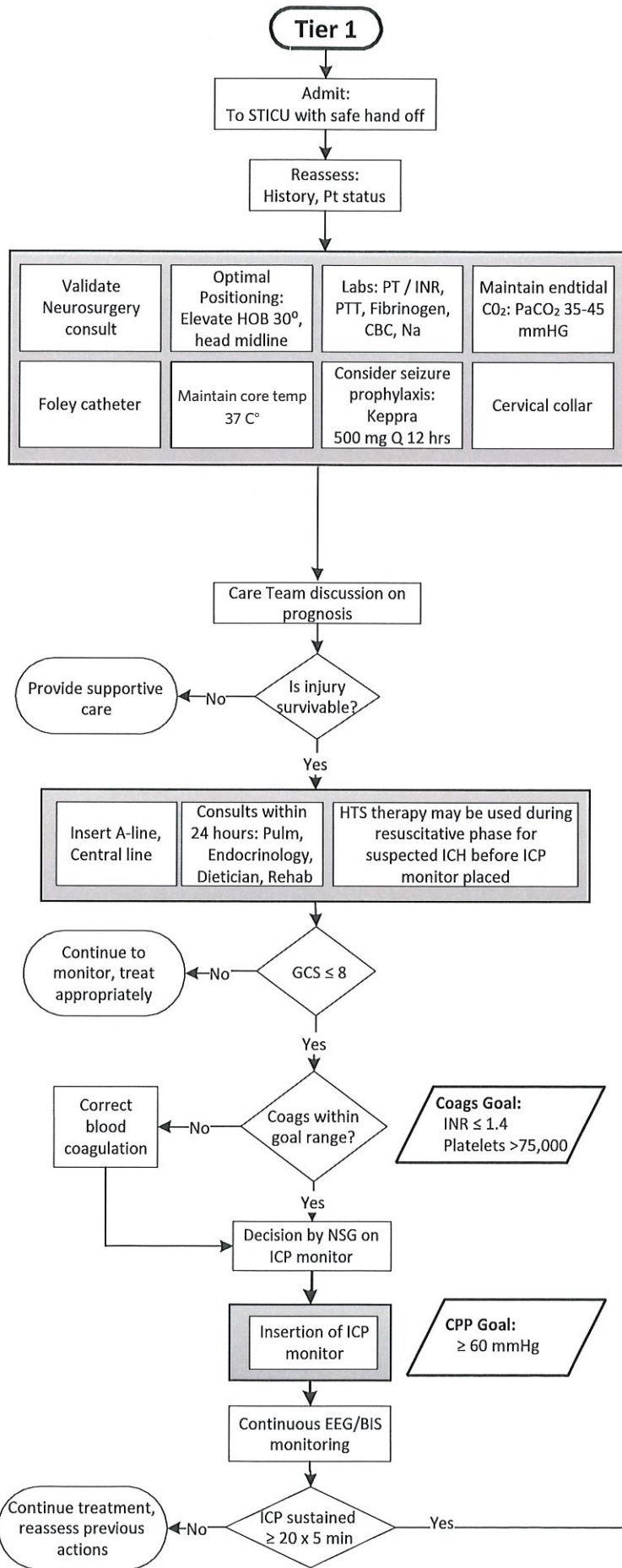
## Guideline:

- Complete primary and secondary survey per guidelines
- Refer to severe TBI algorithm on next page

## Review/Revision History:

Review /Revision Date:	Approved by:
Created 02/2018	Trauma Services
Revised 02/2022	Trauma Services
Revised 03/2022	Trauma Services

# Severe traumatic brain injury: Guideline for management of ICH in STICU



Acute and Sustained Rise in ICP: Concern for impending herniation

Indicators:

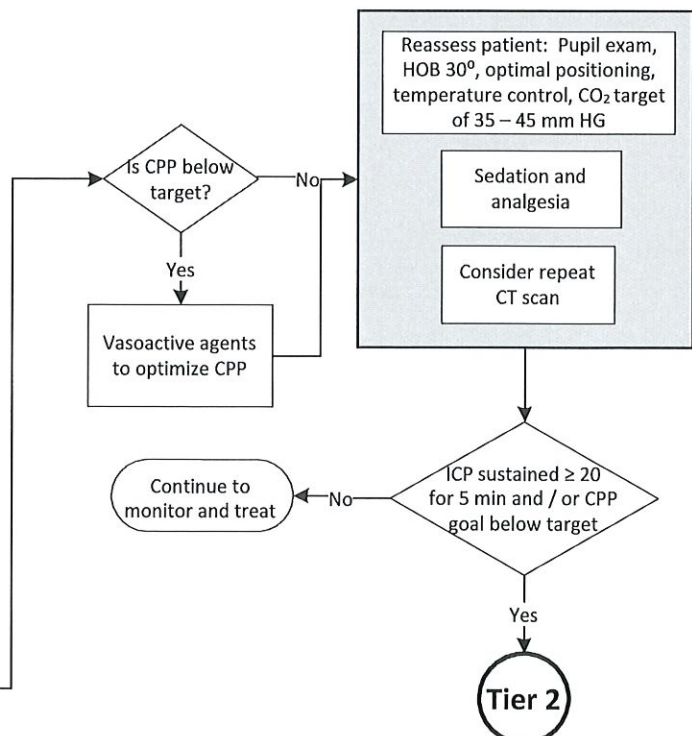
- Acute rise in ICP
- Pupil changes
- Bradycardia and hypertension

Actions:

- Contact **Neurosurgeon and Trauma Surgeon**
- Hyperventilation (brief) to CO<sub>2</sub> level between 30-35 mmHg
- Add sedation / paralysis to treatment
- Give 3% HTS bolus at 250 mL over 30 mins or Mannitol 0.25-1gm/kg body weight

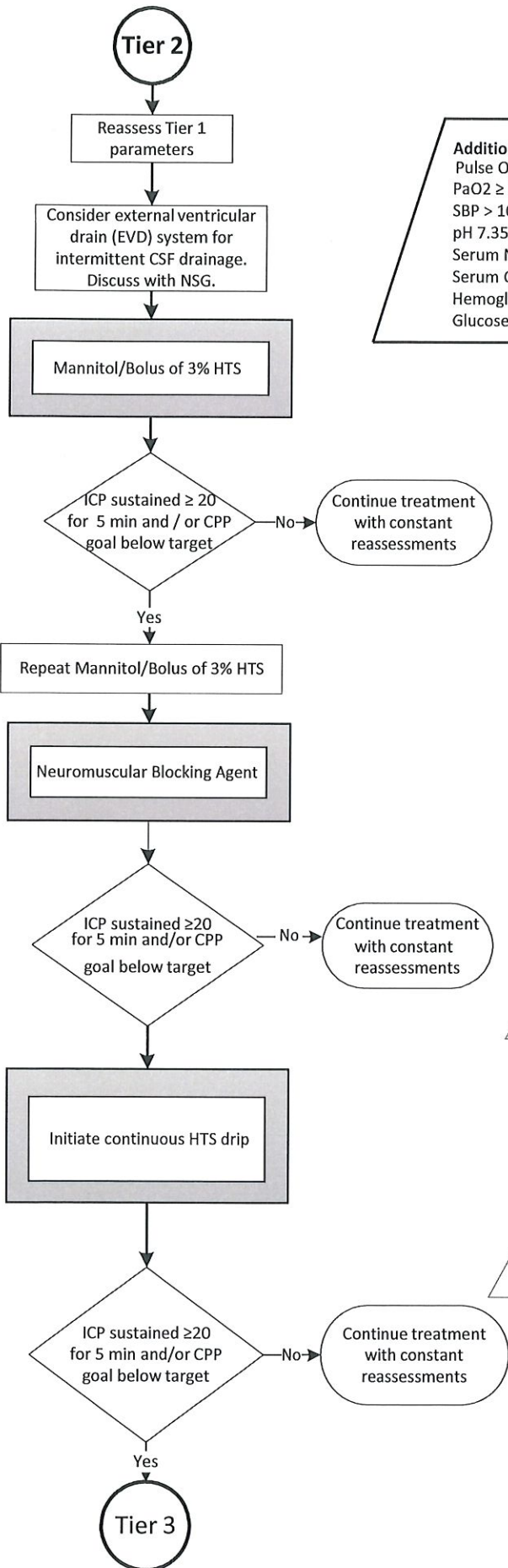
Additional Goals:

- Pulse Ox ≥ 95%
- PaO<sub>2</sub> ≥ 100 mmHg
- SBP > 100 mmHg
- pH 7.35-7.45
- Serum Na 140-155
- Serum Osmo ≤ 320
- Hemoglobin ≥ 7 g/dl
- Glucose 80-180 mg/dl

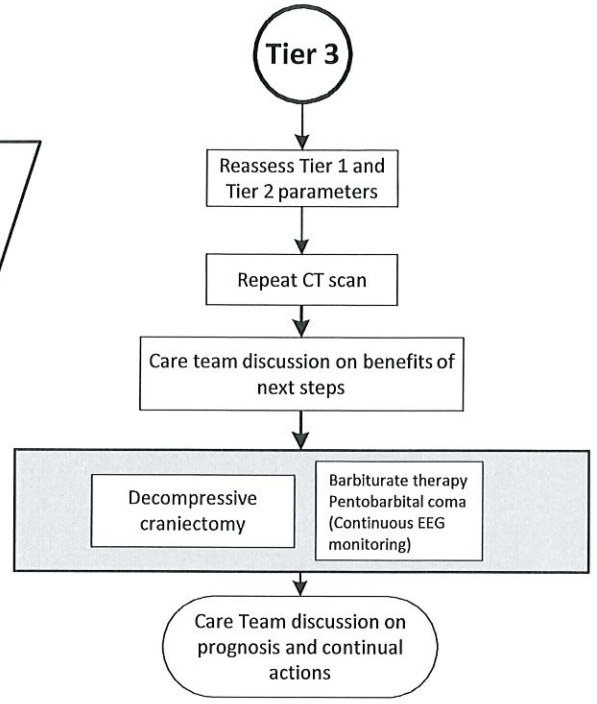


**Tier 2: ICP Non Responsive to Tier 1 Therapy**

**Tier 3: ICP Non Responsive to Tier 2 Therapy**



**Additional Goals:**  
 Pulse Ox  $\geq 95\%$   
 PaO<sub>2</sub>  $\geq 100$  mmHg  
 SBP  $> 100$  mmHg  
 pH 7.35-7.45  
 Serum Na 140-155  
 Serum Osmo  $\leq 320$   
 Hemoglobin  $\geq 7$  g/dl  
 Glucose 80-180 mg/dl



**Barbiturate Therapy**

- Pentobarbital loading dose: 10mg/kg over 30 minutes;
- Initiate continuous drip at 5mg/kg/hr for 5 hours then decrease infusion rate to 1mg/kg/hr (max dose = 5mg/kg/hr). Titrate per physician order for goal burst suppression.

**Hyperosmolar Therapy**

- 3% HTS bolus dosing: administer 250 mL over 30 minutes
- Typical range of 3% HTS continuous infusion: 30-60ml/hr; titrate to keep ICP  $< 20$  or Na level below 160
- Mannitol dosing: 0.25-1 gm/kg body weight
- Concentrate maintenance fluids where possible
- When treating with hyperosmolar therapy, serum sodium and serum osmolality should be assessed every 6 hours.
- Caution should be used if serum osmo exceeds 360 mEq/L
- Consider Mannitol, if osmo  $< 320$ ; maintain osmo  $< 360$

**Additional Information**

- Severe TBI patients should receive full treatment for a minimum of 72 hrs post injury
- Nutrition should begin early, as soon as the patient is hemodynamically stable, & ideally within 24 -48 hrs post injury
- VTE prophylaxis should be considered within the first 72 hrs following TBI.