Guideline

1.0 SCOPE

1.1. Care of the Trauma Services patient at CCHMC.
1.2. This guideline provides the clinical guidance of care for any patient with a severe traumatic brain injury (TBI).

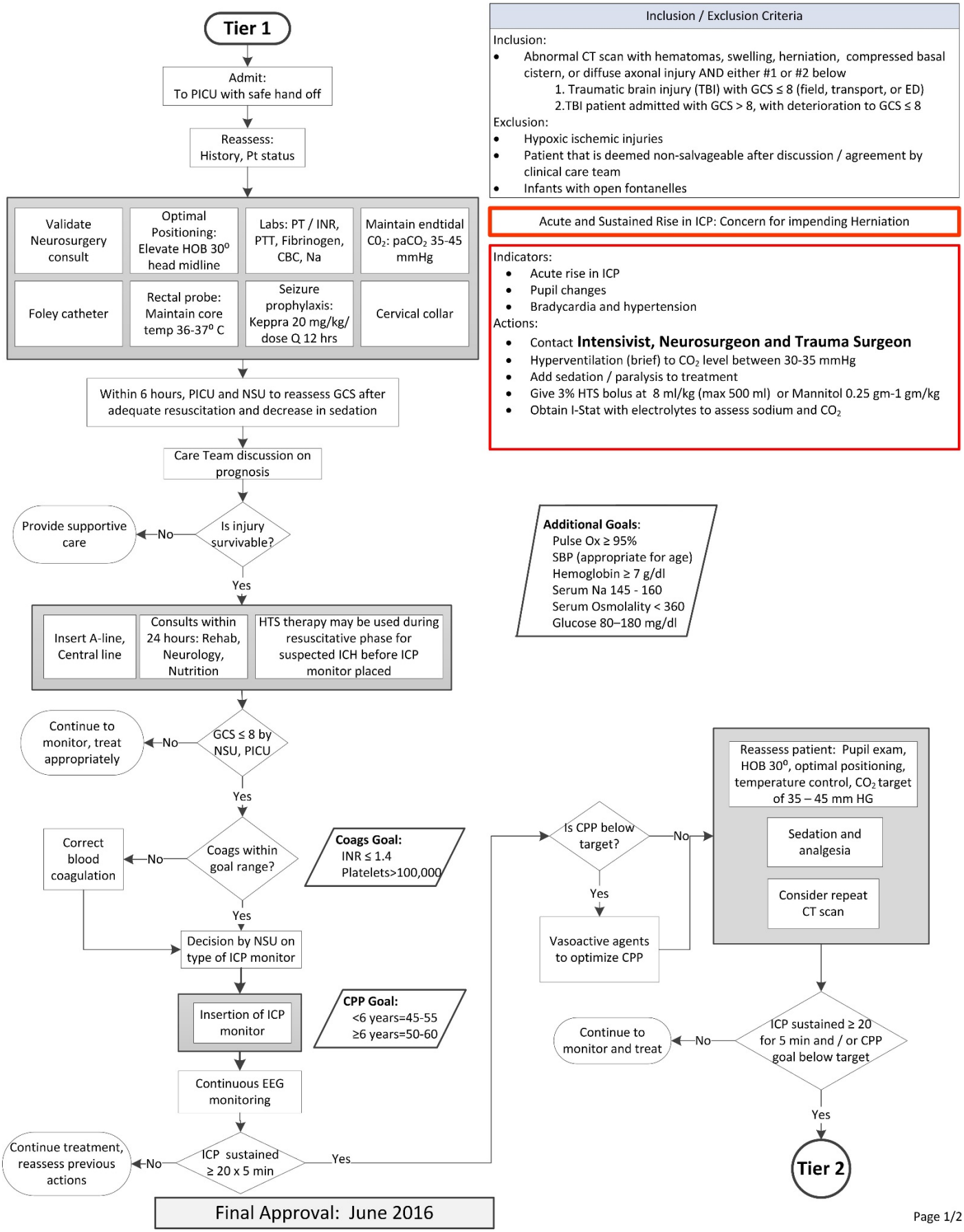
2.0 DEFINITIONS

2.1. **Severe Traumatic Brain Injury:** Inclusion Criteria:
  2.1.1. Abnormal CT scan with hematomas, swelling, herniation, compressed basal cistern, or diffuse axonal injury AND either #1 or #2 below
    2.1.1.1. Traumatic brain injury (TBI) with GCS ≤ 8 (field, transport, or ED)
    2.1.1.2. TBI patient admitted with GCS > 8, with deterioration to GCS ≤ 8
2.2. Exclusion Criteria:
  2.2.1. Hypoxic ischemic injuries.
  2.2.2. Patient that is deemed non-salvageable after discussion / agreement by clinical care team
  2.2.3. Infants with open fontanelles

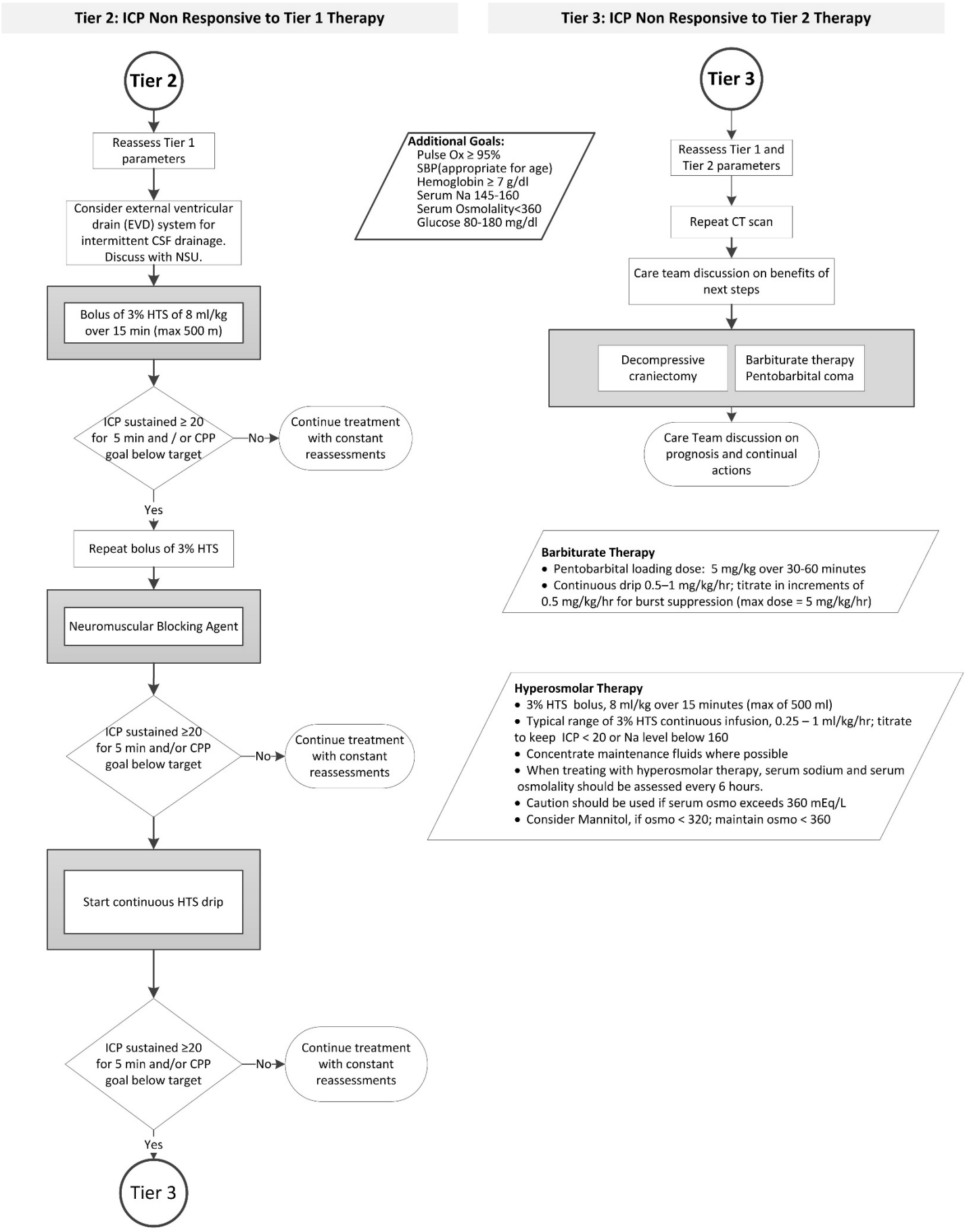
3.0 GUIDELINE

3.1. Complete primary and secondary survey per guidelines.
3.2. Refer to Severe TBI flow diagram next page

Severe Traumatic Brain Injury: Guideline for Management of ICH in PICU



Final Approval: June 2016


Tier 2: ICP Non Responsive to Tier 1 Therapy
Tier 2
Reassess Tier 1 parameters
Consider external ventricular drain (EVD) system for intermittent CSF drainage. Discuss with NSU.
Bolus of 3% HTS of 8 ml/kg over 15 min (max 500 m)
ICP sustained ≥ 20 for 5 min and / or CPP goal below target
No
Continue treatment with constant reassessments
Yes
Repeat bolus of 3% HTS
Neuromuscular Blocking Agent
ICP sustained ≥20 for 5 min and/or CPP goal below target
No
Continue treatment with constant reassessments
Start continuous HTS drip
ICP sustained ≥20 for 5 min and/or CPP goal below target
No
Continue treatment with constant reassessments
Yes
Tier 3
Additional Goals:
Pulse Ox ≥ 95%
SBP(appropriate for age)
Hemoglobin ≥ 7 g/dl
Serum Na 145-160
Serum Osmolality<360
Glucose 80-180 mg/dl
Tier 3: ICP Non Responsive to Tier 2 Therapy
Tier 3
Reassess Tier 1 and Tier 2 parameters
Repeat CT scan
Care team discussion on benefits of next steps
Decompressive craniectomy
Barbiturate therapy Pentobarbital coma
Care Team discussion on prognosis and continual actions
Barbiturate Therapy
• Pentobarbital loading dose: 5 mg/kg over 30-60 minutes
• Continuous drip 0.5–1 mg/kg/hr; titrate in increments of 0.5 mg/kg/hr for burst suppression (max dose = 5 mg/kg/hr)
Hyperosmolar Therapy
• 3% HTS bolus, 8 ml/kg over 15 minutes (max of 500 ml)
• Typical range of 3% HTS continuous infusion, 0.25 – 1 ml/kg/hr; titrate to keep ICP < 20 or Na level below 160
• 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

4.0 REFERENCES

4.1. Brain Trauma Foundation; American Association of Neurological Surgeons; Congress of Neurological Surgeons; Joint section of Neurotrauma and Critical Care, AANS/CNS, Bratton SL, Chestnut RM, Ghajar J, McConnell Hammond FF, Harris OA, Hartl R, Manley GT, Nemecek A, Newell DW, Rosenthal F, Schouten J, Shutter L, Timmons SD, Ullman JS, Videtta W, Wilberger JE, Wright DW. Guidelines for the Management of Severe Traumatic Brain Injury. 2007.

5.0 APPROVALS

All revisions of this guideline are approved by the Trauma Service Department. This guideline is reviewed every three years or sooner if deemed necessary. Policy authority for this document resides with the Trauma Service Department. This guideline is approved by the Trauma Services Manager and the Director of Trauma Services.

HISTORY
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07/2016
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06/18