

## Critical Thinking Algorithms Severe Brain Injury Population

**PbtO2 >20 - 40 mm Hg  
ICP > 20 mm Hg**

- Drain CSF
  - ↓ CO2 until ICP < 20;  
stop ↓ when PbtO2 < 20
  - Optimize CPP for pt.  
Use fluids to optimize  
CVP/PCWP and use  
Vasopressors to  
↑ CPP
  - ✓ analgesia/sedation:  
↑ Morphine/Ativan prn
  - Give Mannitol 0.25-1.0  
grams/kg IV
  - Call MD
  - ↑ Propofol and titrate  
10-100 ug/kg/min for  
ICP elevations
  - CT scan if ICP doesn't  
remain < 20 mmHg
- MD Decision**  
Pentobarb Coma  
vs  
Craniectomy

**PbtO2 < 20 mm Hg  
ICP > 20 mm Hg**

- Drain CSF
  - Place patient on 100% FIO2 x 5-15'
  - Optimize CPP for patient:
    - 1) Use fluids to optimize  
CVP/PCWP & Packed RBCs to  
Hematocrit of 33 if PbtO2 < 20
    - 2) Vasopressors
  - ✓ analgesia: ↑ Morphine if needed
  - Give Mannitol 0.25-1.0 grams/kg IV
  - ↑ Propofol/Titrate 10-100 ug/kg/min
  - Call MD
  - CT scan if ICP doesn't remain < 20
- MD Decision**
- ↓

↓
- Pentobarbitol Coma    Craniectomy
- \*Refer to decision tree in ICP < 20  
and PbtO2 < 20 for critical analysis of  
hemodynamic vs. pulmonary causes

**PbtO2 < 20 mm Hg  
ICP < 20 mm Hg**

- ✓ PaCO2: if low then ↑ to 40-45 mm Hg as  
long as ICP stays within range
  - If still low, place patient on 100% FIO2 x 5-15'
  - ✓ lung sounds/vent settings/CVP/PCWP/CI/MAP
- 1) Hemodynamic Eval

  - ✓ PCWP/CVP: if ↓ fluids
  - ✓ H/H: transfuse if < 33%
  - ✓ MAP/SVR/SV/LVSWI
    - a) If SVR < 1000, start  
Neo/Dopamine
    - b) If SVR > 1500cc,  
reeval vasopressors
    - c) If PVR ↑ & levophed  
used, wean levophed

2) Pulmonary Eval  
Consult RCP

  - ✓ vent settings
  - ✓ need for sedation
  - ✓ need for paralytic
  - ✓ need for treatments  
Change vent settings  
instead of high FIO2  
Evaluate I:E status
- 3) Fluid overload rt pulm. edema/volume overload
    - a) ✓ I/O balance    b) ✓ Chest Xray
    - c) ✓ PVR/LVSWI    d) Call MD    e) Consider Lasix
  - 4) Temp Management: Keep 36-37°/Individualize  
patient