Increased Intracranial Pressure (ICP) Management Algorithm

**Criteria for ICP Management**
If ICP is > 20 mmHg for more than 5 minutes or ICP is > 25 mmHg

**Initial Interventions**
- Troubleshoot ICP to ensure accuracy of monitored data
- Call Neurosurgery House Officer or neurocritical care team
- Elevate head of bed 30°, midline position
- Assess level of sedation and pain
- Check temperature (treat if > 99°F, cooling blanket)
- Arterial blood gases (ABG)

**ICP normal?**
- **Targets:**
  - ICP < 20 mmHg
  - CPP > 70 mmHg
  (Formula: CPP = MAP - ICP)*

- **YES** Observe

**ICP normal?**
- **YES** Observe

**NO** Reassessment
- Monitor ICP
- Neuro exam

**Stepwise Treatment**
1. **Stat head CT**
2. **Cerebrospinal fluid:** Drain if appropriate. Consult Neurosurgery if considering ventriculostomy or lumbar drain, if not already in place.
3. **Hyperosmolar therapy:**
   - Mannitol (0.25-1 g/kg IV q6h, hold for osmol greater than 320 -- target serum osmol 300-320 mOsm/kg), or
   - Hypertonic saline (3% NaCl, ~4 ml/kg (maximum 500 mL), hold for osmol greater than 320 mOsm/kg or serum Na greater than 160 – target serum osmol 300-320 mOsm/kg and serum Na 145-155)
4. **Sedation:** propofol, per protocol*, max rate of 50 mcg/kg/min, or possibly induce pentobarbital coma, loading dose 10 mg/kg, max rate of 50 mg/min, then 1-3 mg/kg/hr.
5. **Hyperventilation:** PaCO₂, 30-35 mmHg, use for no longer than 30 minutes.
6. **Surgical decompression** (if surgical candidate).

*ICU IV Infusion Guidelines, Pharmacy website.

**Consider other causes, such as:**
- Hypercarbia
- Hypoxia
- Hyperthermia
- Hypoglycemia
- Inadequate sedation/analgesia
- Suctioning
- Mass lesion
- Cerebral edema
- Technical problem with ICP monitor

* Key: CPP = Cerebral Perfusion Pressure; MAP = Mean Arterial Pressure

Notes: (1) ICP and CPP targets can be adjusted, based on physician judgment. (2) Use of vasopressors to maintain CPP greater than 70 is discouraged in patients with traumatic brain injury.

**References:**