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|  | **Nursing School 911** |  |
| **Pathophysiology: Increased ICP** | **Signs & Symptoms** | **Nursing Care** |
| **Etiologies/ Risk Factors:** Anything that increases blood, CSF, or brain volume (cerebral edema)**Traumatic brain injury** is the etiology Bleeding and cerebral edemaIncreased ICPDecreased CPP (cerebral perfusion pressure)*Compensatory mechanisms for decreased CPP: CSF shifts to spinal cavity & systemic vasoconstriction to decrease blood flow to brain*If compensatory mechanisms are ineffective…..Cerebral hypoxia/ cellular necrosisCytotoxic cerebral edemaSeverely increased ICP! | **\*Normal ICP 5-15 mmHg\*****Early:** \*\*\*Restlessness/ agitation, HA (pressure on meninges), Vomiting (pressure on medulla)**Late:** \*Cushing triad (Increased SBP/ wide pulse pressure, Bradycardia, Bradypnea), fixed/dilated pupils, seizures, papilledema (vision problems), Doll’s eyes (brain stem impairment), +Babinski reflex | **Priority Assessments:**1. Airway (If LOC is decreased the patient can’t protect their airway)
2. Breathing (RR/effort/quality/breath sounds/O2 sat/ ABGs)
3. Circulation (BP and HR)
4. LOC/MS/GCS
5. Pupils/ EOMs (CN II, III. IV, VI)
6. Advanced neurological assessments: oculocephalic and oculovestibular
7. Body temperature (hyperpyrexia increases metabolic demands)
8. Skin assessments (pressure injuries)
9. Hemodynamic monitoring: ICP monitoring; CVP must be maintained to maintain CPP

**Priority Interventions:**1. HOB 30-45 degrees: NO HEAD FLEXION
2. LIMIT SUCTIONING if intubated!
3. Prevent hypoxia and hypercapnia!
4. Mechanical ventilation for CO2 removal
5. Anti-pyretics to treat fever
6. Prevent shivering (sedatives)
7. Avoid straining (stool softeners), vomiting (anti-emetics), sneezing, agitation
8. Restraints are a LAST RESORT! They increase ICP!
9. Enteral nutrition
10. Meticulous skin care, care of invasive sites
11. DVT Prophylaxis
12. **Medications:**

Barbiturates: Decrease cerebral metabolismVasopressors: Maintain MAP and CPPMannitol: Decrease cerebral edemaLoop diureticsCorticosteroids |



**KEY POINTS:**

* **Common causes of increased ICP:** Acidosis (cerebral vasodilation), head trauma, meningitis/ encephalitis, tumor
* **Normal ICP Range:** 5-15 mmHg; ICP > 20 mmHg warrants immediate intervention!
* Increased ICP decreases CPP (CPP= MAP – ICP)
* CPP should be greater than 70 mmHg
* The EARLIEST sign of increased ICP is restlessness/ agitation!
* Cushing triad is a LATE sign of increased ICP (brain herniation)!
* PROPER POSITIONING is key!



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**Reference**: www.medscape.com