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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 edema  Increased ICP  Decreased 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 necrosis  Cytotoxic cerebral edema  Severely 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 metabolism  Vasopressors: Maintain MAP and CPP  Mannitol: Decrease cerebral edema  Loop diuretics  Corticosteroids |

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**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