

**The George Washington University Hospital**  
**Standard Practice Manual**

**Burst – Suppression Protocol**

<b>General Description:</b>	Deep anesthesia to the point of EEG electrical silence lowers ICP and decrease the cerebral metabolic usage of oxygen by altering vascular tone, suppressing metabolism, inhibiting free radical mediated lipid peroxidation, and coupling cerebral blood flow to regional metabolic demands. This has a beneficial effect on ICP and global cerebral perfusion.
<b>Purpose:</b>	Anesthesia titrated to a burst-suppression pattern on the EEG is used in patients with severe brain injury when intracranial hypertension is refractory to maximal medical and surgical intracranial pressure (ICP) lowering therapy. This protocol is intended to enable rapid implementation of burst suppression; parameters may be modified to meet individual patient needs.
<b>Patient Population Involved:</b>	Severe brain injured patients with increased ICP refractory to maximal medical and surgical therapy. Patients in status epilepticus or recurrent seizures uncontrollable with standard anticonvulsant therapy.
<b>Providers Involved:</b>	Physicians, Nurses, Pharmacists, and Respiratory Therapists

**Protocol:**

1. The neurosurgeon/neurologist will assess patients for appropriateness of treatment. Patients sustaining the following are candidates for burst suppression:
  - a. Traumatic brain injury with increased ICP not controlled with maximal medical and surgical interventions.
  - b. Intracerebral hemorrhage including Subarachnoid hemorrhage.
  - c. Status epilepticus.
2. Upon receipt of the physician order to administer institute burst suppression, assure the patient has the following supportive equipment:
  - a. Mechanical ventilator and pulse oximeter/End tidal CO<sub>2</sub> monitor
  - b. Cardiac monitor
  - c. Central venous pressure.
  - d. Arterial catheter for invasive BP monitoring
  - e. Vascular access (large bore lines) sufficient to allow fluid and medication administration
  - f. Bispectral Index Monitor (BIS)
  - g. Bedside EEG monitor capable of monitoring burst suppression, if ordered by neurosurgeon/neurologist
  - h. ICP monitor\*
    - Note: \*These items may not be needed in certain patients and are at the discretion of the physician.
3. Assess the patient's clinical status. Prior to initiating burst suppression
  - a. Assure ventilatory status is secured by mechanical ventilation. Maintain SaO<sub>2</sub> > 95%.
  - b. Assure patient is normovolemic. Maintain CVP > 5 mm Hg titrate with 5% albumin or NS per order.
  - c. Assure Cerebral Perfusion Pressure (CPP) is > 70 mm Hg. Administer volume as stated above and then begin vasopressors to achieve adequate Mean Arterial Pressure (MAP) per physician order.
  - d. Assure /sequential compression device are in place
  - e. Assess ICP if monitor in place and document.
  - f. Initiate Bispectral Index Monitor (BIS).

4. Dosage of Thiopental per physician order to induce burst suppression:
  - A. For increased ICP:
    1. Loading dose: 5 mg/kg of thiopental sodium over 10 minutes IV, then thiopental 2 mg/kg/10 minutes until BIS shows suppression ratio > 80% or BIS index < 20.
    2. Thiopental infusion to maintain BIS SR 70 – 80% or BIS index < 20. Titrate per sedation protocol.
  - B. For Status epilepticus:
    1. Loading dose: 5 mg/kg of thiopental over 5 minutes IV, repeat every 5 minutes until BIS shows suppression ratio > 80% or BIS index , 20..
    2. Thiopental infusion to maintain BIS SR 70 – 80%. Titrate per sedation protocol.
5. Assess patient closely while on burst-suppression therapy.
6. Monitor Neuro status. Pupils may vary in size and be non-reactive. However, changes in eye exam should be reported to neurosurgery/ neurology. Blink reflex and cough reflex will diminish or be absent.
  - 1) Lacrilube both eyes, q 4 hours
  - 2) Monitor ICP and responses to therapy.
  - 3) If EEG is ordered, monitor EEG for burst suppression. Goal is 10-12 seconds (5-6 lines on EEG) of burst suppression as seen on EEG.
  - a. Monitor respiratory status. Due to diminished cough reflex, patient is at great risk for pulmonary sequelae.
    - 1) Monitor ventilator settings, SaO<sub>2</sub>, PaO<sub>2</sub>, and PaCO<sub>2</sub>/ETCO<sub>2</sub>.
    - 2) Turn patient at least every 1-2 hours, and as needed; avoid head down positioning – document on flow sheet.
    - 3) Suction patients as indicated
  - b. Monitor hemodynamic status
    - 1) Monitor MAP.
    - 2) Titrate volume to maintain CVP per physician orders
    - 3) Administer vasopressors to maintain an adequate CPP (or MAP > 90 mm Hg if no ICP) as per physician orders. Neosynephrine, Dopamine, or norepinephrine may be used to enhance MAP per order.
    - 4) Monitor serum electrolytes q 24 hours or as needed per physician order.
  - c. Assure system support is instituted
    - 1) NG/OG to low continuous suction
    - 2) Maintain normothermia 36 – 37.5°C.
    - 3) Sequential compression device to reduce risk of DVT
    - 4) Skin assessment and care prn and document on flow sheet
    - 5) Range of motion to extremities as tolerated
7. Upon physician order to discontinue coma, wean propofol to off over one hour.