

## Clinical Provocative Testing Protocols

Provocative testing in the clinical setting is important for identifying defective neuromonitoring equipment and defining individual patient physiology so as to tailor therapy accordingly. The patient's nurse and respiratory therapist should be made aware prior to testing. Provocative testing will be performed in the following order by a member of the neurosurgical or neurocritical care team. All physiological parameters are collected at 1 minute intervals.

### A. Pressor Challenge:

ABG and VBG are drawn at baseline  $\text{FiO}_2$  and physiological parameters (including a k value) are recorded for 3 minutes. IV pressor therapy will be initiated or increased to raise the baseline MAP by 10-15 mm Hg above baseline

- initiation occurs with phenylephrine 10 mcg/min IV and increased by 20 mcg/min every 5 minutes until a goal MAP is reached
- for patients already on phenylephrine drip the rate of infusion will be increased by 25% every 5 minutes until the goal MAP is reached

Once the goal MAP is obtained an ABG and VBG are drawn

Maximum testing time is 40 minutes

Testing is not initiated or is discontinued for HR <65, MAP >100

Once the MAP returns to baseline the oxygen challenge is initiated after a waiting of at least 30 minutes.

### B. Oxygen Challenge:

ABG and VBG are drawn at baseline  $\text{FiO}_2$  and physiological parameters (including a k value) are recorded for 3 minutes.

$\text{FiO}_2$  increased to 1.0 and continued throughout oxygen challenge and hyperventilation challenge.

Testing continues until the  $\text{P}_{\text{BrO}_2}$  reaches a stabilization point

Testing time takes approximately 20 minutes

At the end of the oxygen challenge an ABG and VBG are drawn and the hyperventilation challenge is initiated

### C. Hyperventilation Challenge:

Baseline RR is initially increased by 33% with a goal of decreasing baseline  $\text{EtCO}_2$  by 10mm Hg . If goal  $\text{EtCO}_2$  is not reached after 5 minutes, RR is increased by increments of 3 every 5 minutes to reach goal. Once goal  $\text{EtCO}_2$  is obtained and remains stable for 3 consecutive minutes an ABG and VBG are drawn and the patient is placed back on their baseline RR

Maximum testing time is 30 minutes

Testing is not initiated if the baseline  $\text{PaCO}_2 < 30\text{mm Hg}$  or baseline  $\text{EtCO}_2 < 25\text{ mm Hg}$

Test is discontinued if pre-test  $\text{P}_{\text{BrO}_2}$  decreases by more than 50% of baseline, or the patient becomes hemodynamically unstable ( $\text{O}_2$  saturation  $< 92\%$ ,  $\text{MAP} < 70 > 110$ ,  $\text{HR} < 55$ ,  $\text{RR} > 35$ )