

**WEST VIRGINIA UNIVERSITY**  
**HOSPITALS**  
**POLICY AND PROCEDURE MANUAL**

**Policy IV.058 WVUH**  
**1st Effective 09/29/2022**  
**Revised 09/29/2022**  
  
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**APNEA TEST FOR DETERMINATION OF DEATH BY NEUROLOGICAL CRITERIA  
IN ADULTS NOT ON ECMO**

**Purpose:**

To standardize the evaluation of patients in regard to Brain Death and Apnea. Brain death is defined as the irreversible cessation of cerebral and brain stem function. For the Apnea Test to be positive there is to be no respiratory drive, or spontaneous breaths regardless of hypercarbia or hypoxemia. The following pre-requisites should be observed before proceeding with the test.

**Prerequisites:**

- Coma and absence of all brain stem reflexes (see Brain Death Protocol)
- Physician order
- $\geq 18$  years old
- Notify the RN prior to performing the test
- Physician must be present at bedside when performing apnea test
- Core temperature  $\geq 36.0$  C
- Systolic blood pressure  $\geq 100$  mm Hg
- RT and attending physician must be available at bedside.

**Apnea Test procedure:**

1. Review the last Blood Gas (Must have been obtained within the last 4 hours) making sure the PCO<sub>2</sub> is 35-45mm Hg and the PaO<sub>2</sub> > 80 mm Hg for patients with no pre-existing conditions (normal).
2. Set the FiO<sub>2</sub> to 100% for a minimum of 10 minutes prior to step 3
3. Place the patient on T-Piece. (Spontaneous mode ventilation is not recommended due to the inability to eliminate backup mode ventilation, to ensure that nonrespiratory movements initiate breaths, or that low respiratory rate ventilations are not initiated by patient.)
4. Closely look for respiratory movements that produce adequate tidal volumes
5. Closely monitor the HR, BP, SpO<sub>2</sub>, and RR with documentation every minute for 10 minutes. An additional 5 minutes of testing with documentation of vitals every minute is permitted if the patient is tolerating the procedure and if desired by the attending physician at bedside for a total of 15 minutes.
6. An arterial blood must be checked at the time of termination of the apnea testing for any reason (e.g end of test or patient instability) prior to the patient being placed back on the ventilator. The attending at bedside may request additional testing at their discretion (e.g. at 5, 10, and/or 15 minutes)
7. It is preferred to maintain SpO<sub>2</sub>  $\geq 92\%$  unless instructed to do otherwise by the Physician
8. If there is significant vital instability an ABG should be obtained, and testing terminated.
9. The apnea test is positive if (both required):
  - a. Spontaneous respiratory movements are absent and
  - b. The PaCO<sub>2</sub> is greater than or equal to 60 mmHg or if there is an increase by 20 mmHg in a patient with known CO<sub>2</sub> retention which would result in a final PaCO<sub>2</sub> greater than 60.
10. Testing is negative if:
  - a. Spontaneous respiratory movements are observed, or

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- b. PaCO<sub>2</sub> does not reach greater than or equal 60 mmHg or an increase in 20 mmHg from known elevated baseline in patients with known CO<sub>2</sub> retention
- 11. At the termination of the test (for any reason), obtain an Arterial Blood Gas prior to placing the patient back on the pre-test ventilator settings.
- 12. Chart the outcome of the test. Including:
  - Duration of test
  - HR every 1 min.
  - BP every 1min.
  - SpO<sub>2</sub> every 1 min.
  - Reason for terminating the test

Terminate the test if patient starts breathing spontaneously, develops hypotension, significant hypoxia, or significant cardiac arrhythmias.

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## Adult Apnea Testing Form

*Patient Sticker*

Date: \_\_\_\_\_

Name of Physician present: \_\_\_\_\_

Name of the patients R.N. that was notified of testing : \_\_\_\_\_

### Ventilator Settings Pre-Test:

Mode \_\_\_\_\_ FiO<sub>2</sub> \_\_\_\_\_ Rate \_\_\_\_\_ Vt \_\_\_\_\_ PEEP \_\_\_\_\_

Pressure Control/P High \_\_\_\_\_ Pressure Support (Hi/Low if needed) \_\_\_\_\_

**Pre-testing Arterial Blood Gas(ABG):** Time ABG performed \_\_\_\_\_

pH \_\_\_\_\_ CO<sub>2</sub> \_\_\_\_\_ PaO<sub>2</sub> \_\_\_\_\_ HCO<sub>3</sub> \_\_\_\_\_ BD/BE \_\_\_\_\_

**Time placed on 1.00 FiO<sub>2</sub> for pre-test(minimum of 10 minutes):** \_\_\_\_\_

### Ventilator or Aerosol T-Piece(ATP) settings during test:

Mode/ATP \_\_\_\_\_ FiO<sub>2</sub> \_\_\_\_\_ Rate \_\_\_\_\_ Vt \_\_\_\_\_

PEEP \_\_\_\_\_

Pressure Control/P High \_\_\_\_\_ Pressure Support (Hi/Low if needed) \_\_\_\_\_

### Monitor Vital Signs Q1 Minute for the duration of the test (10 minutes)

Time	Heart rate	Blood Pressure	SpO <sub>2</sub>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Reason test terminated if needed. Check all that apply.

Spontaneous Respirations \_\_\_\_\_

Arrhythmias \_\_\_\_\_

SpO<sub>2</sub> < 92 for CORE pt's \_\_\_\_\_

Hypotension \_\_\_\_\_

Physician decision \_\_\_\_\_

Time Test Stopped \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Post-testing ABG(ABG is to be obtained prior to placing patient back to pre-test ventilator settings):** Time of ABG \_\_\_\_\_

pH\_\_\_\_\_ CO<sub>2</sub>\_\_\_\_\_ PaO<sub>2</sub>\_\_\_\_\_ HCO<sub>3</sub>\_\_\_\_\_ BD/BE\_\_\_\_\_

**Ventilator Settings Post-Testing:**

Mode\_\_\_\_\_ FiO<sub>2</sub>\_\_\_\_\_ Rate\_\_\_\_\_ Vt\_\_\_\_\_ PEEP\_\_\_\_\_

Pressure Control/P High\_\_\_\_\_ Pressure Support (Hi/Low if needed)\_\_\_\_\_