


Name of Policy: <u>Apneic Oxygenation Test</u> Policy Number: 3364-136-01-15 Department: Pulmonary Services Approving Officer: Senior Hospital Administrator Responsible Agent: Director, Pulmonary Services Scope: The University of Toledo Medical Center Pulmonary Services Department	 Effective Date: March 1, 2023 Initial Effective Date: 5/1/1981
<input type="checkbox"/> New policy proposal <input type="checkbox"/> Major revision of existing policy	<input type="checkbox"/> Minor/technical revision of existing policy <input checked="" type="checkbox"/> Reaffirmation of existing policy

(A) Policy Statement

Brain death occurs as a result of absent cerebral blood flow due to trauma or critical illness. Brain death determination is usually confirmed by a neurologic examination along with a positive apnea test (lack of spontaneous respiratory efforts in the presence of an elevated PaCO₂). Apneic diffusion oxygenation is the procedure used to maintain oxygenation during apnea testing. The following procedure shall only be performed with an appropriate written order by the responsible physician, and in the presence of the examining physician. The procedure is in accordance with the UTMC Policy 3364-100-45-02 "Request for Determination of Death by Brain Criteria".

(B) Purpose of Policy

To test the absence of spontaneous respiratory activity under optimally controlled circumstances for patient safety.

(C) Procedure

1. Ventilation on 100% oxygen for 20 minutes. The Respiratory Care Practitioner will increase the FIO₂ on the ventilator to 1.0 for a period of twenty minutes without a change in other ventilatory parameters. Pre-oxygenation eliminates the respiratory nitrogen stores, accelerates the transport of oxygen and significantly decreases the risk of hypoxic complications during the test.
2. Draw blood for determination of arterial blood gases. The patient's oxygen saturation will be monitored with a pulse oximeter during the apneic oxygenation test. The Respiratory Care Practitioner will draw an arterial blood gas sample at the end of twenty minutes of the patient's exposure to an FIO₂ of 1.0. The results of the blood gas must be reported to the responsible Respiratory Care Practitioner and the examining physician before continuing with the test.
3. Insertion of a catheter via the endotracheal tube into the trachea above the carina, for insufflation with 100% oxygen at 6 l/m, long enough for a rise in PCO₂ of at least 20 mmHg, or in the case of a CO₂ retainer, to at least 20 mmHg above baseline.
 - a. With the physician's approval, the Respiratory Care Practitioner will disconnect the patient from the ventilator. Using sterile technique, an O₂ catheter (size 14 French) lightly lubricated with a water-soluble gel, will be inserted by the Respiratory Care Practitioner into the patient's trachea via the endotracheal or tracheostomy tube. Six liters of oxygen will be delivered through the catheter.

- b. The examining physician and the responsible practitioner will observe the absence of spontaneous breathing for a test period of ten minutes, during which the patient's ventilation is unsupported. If the patient has any significant cardiac arrhythmias, the oxygen saturation drops below 85%, has a significant change in blood pressure, or spontaneous breathing occurs, blood gases will be drawn, and the patient placed back on the ventilator.
4. Repeat blood draw for determination of blood gases. The Respiratory Care Practitioner will draw an arterial blood gas sample at the end of ten minutes of apneic oxygenation, provided that the test was not terminated due to cardiopulmonary changes as described in step 3 above.
5. Removal of catheter and resumption of ventilation. The Respiratory Care Practitioner will reconnect the ventilator to the patient and adjust the FIO2 to the setting prior to the apneic O2 test. According to Plum and Posner (1980), the PCO2 rises 5 points per minute during apneic oxygenation. Therefore, regardless of starting level, the PCO2 would rise high enough so that neither hypocapnia nor brain stem ischemia could be causes of continued apnea. The second ABG is obtained to prove the PCO2 rise.
6. The Respiratory Care Practitioner will report the results to the responsible physician.
7. Record the completion of the test in the EMR.

<p>Approved by:</p> <p><u>/s/</u> Michael J. Taylor Director, Pulmonary Services</p> <p><u>3/1/2023</u> Date</p> <p><u>/s/</u> Russell Smith Senior Hospital Administrator</p> <p><u>3/3/2023</u> Date</p> <p><i>Review/Revision Completed By: Director, Pulmonary Services</i></p>	<p>Review/Revision Date:</p> <p>07/30/1998 10/04/1999 10/01/2001 03/14/2002 03/01/2005 09/17/2007 09/22/2010 08/02/2012 12/01/2015 04/08/2019 03/01/2023</p> <p>Next Review Date: March 2026</p>
<p>Policies Superseded by This Policy:</p>	