



## College of Intensive Care Medicine of Australia and New Zealand

### Work-Based Competency Assessment: Brain Death

This assessment is designed to be used as a learning tool and for assessment purposes. Prior to presenting for assessment the trainee should have developed the knowledge, behaviours and skills necessary for determination of brain death. This competency can be assessed by a Fellow of the CICM. To **be deemed competent (passing) the trainee will demonstrate adequate or good knowledge and skills in all performance indicators.**

<b>Trainee</b>		
<b>Assessor</b>		
<b>Date</b>		
<b>Result</b> (please circle)	<b>Passed</b>	<b>To be repeated</b>

Trainee signature:.....

Assessor signature:.....

Professional Elements of Practice	Performance Criteria	Improvement required	Acceptable	Good	Comments
What legislation governs this area of ICU practice?	Human Tissue Act in each State and Territory.				
What is the pathophysiology of brain death?	Severe brain injury / Elevation of intracranial pressure / Inadequate cerebral perfusion pressure / Cycle of cerebral ischaemia and oedema / Intracranial pressure reaches or exceeds systemic blood pressure / Intracranial blood flow ceases / Whole brain including brain stem dies.				
What must be known about the brain pathology before considering brain death testing?	Unresponsive coma / clinical or imaging evidence of acute brain pathology that is consistent with the irreversible loss of all brain function.				
What are the two methods for diagnosing brain death?	Clinical testing and imaging demonstrating absence of intracranial blood flow.				
<b>CLINICAL BRAIN DEATH TESTING</b>					
Who can do the testing?	Two medical practitioners with specific experience and qualifications as dictated by the various State and Territory Human Tissue Acts.				
What is the period of observation from apparent loss of brain function required before considering brain death testing?	Minimum of 4 hours observation and mechanical ventilation during which the patient has unresponsive coma, with pupils non-reactive to light, absent cough/tracheal reflex and no spontaneous breathing efforts.				
What time frames are required when brain death is suspected after cardio-respiratory arrest with and without therapeutic hypothermia?	When brain death is suspected following an hypoxic-ischaemic brain injury, clinical brain death testing should be delayed for at least 24 hours after the cardio-respiratory arrest and 24 hours after rewarming if therapeutic hypothermia has been used (with all other preconditions having been met).				

Professional Elements of Practice	Performance Criteria	Improvement required	Acceptable	Good	Comments
What preconditions must be met before determination of brain death by clinical examination can be undertaken?	<ol style="list-style-type: none"> <li>1. Normothermia – temperature &gt;35°C</li> <li>2. Normotension – Systolic &gt; 90mmHg or MAP &gt; 60mmHg in an adult</li> <li>3. Sedative drug effects are excluded – sufficient time for elimination or use of specific antagonists</li> <li>4. There is no severe electrolyte, metabolic or endocrine disturbance</li> <li>5. Neuromuscular function is intact – peripheral nerve stimulation</li> <li>6. It is possible to examine the brain-stem reflexes (including at least one ear and one eye)</li> <li>7. It is possible to perform apnoea testing – may be precluded by severe hypoxic respiratory failure or a high cervical spinal cord injury</li> </ol>				
Equipment required to proceed with brain death testing	<ol style="list-style-type: none"> <li>1. Brain death record form and pen</li> <li>2. Gloves</li> <li>3. Bright torch</li> <li>4. Soft cotton wool swabs and saline</li> <li>5. Otoscope</li> <li>6. Container of ice with water added</li> <li>7. 50ml syringe, long drawing up cannula, kidney dish</li> <li>8. Laryngoscope</li> <li>9. Cotton swab stick and saline</li> <li>10. Blood gas syringes</li> </ol>				
<u>Demonstrate</u> on the patient how you would test for coma?	Looking for no motor response in the cranial nerve distribution to noxious stimulation of the face, trunk and four limbs and no response in a cranial nerve distribution to peripheral stimulation – pressure over supraorbital nerve / sternal rub / deep nail bed pressure.				
<u>Demonstrate</u> the clinical tests for brain stem reflexes – ideally at the bedside in the ICU on a patient but can be done in a simulation environment.	<ol style="list-style-type: none"> <li>1. Pupillary light reflex</li> <li>2. Corneal reflex</li> <li>3. Reflex response to pain in trigeminal nerve distribution</li> <li>4. Vestibulo-ocular reflex</li> <li>5. Gag reflex</li> <li>6. Cough reflex</li> </ol>				

Professional Elements of Practice	Performance Criteria	Improvement required	Acceptable	Good	Comments
Demonstrate the apnoea test	Preoxygenate / Mild hypercarbia / Apnoeic oxygenation / Timing of ABG / PaCO <sub>2</sub> > 60mmHg and pH < 7.3 / Managing hypoxia during the test.				
What observations are considered to be compatible with brain death?	Spinal reflexes / sweating blushing tachycardia / Normotension with no need for inotropes / Absence of diabetes insipidus.				
What observations are incompatible with brain death?	Decerebrate or decorticate posturing / true extensor or flexor motor responses to painful stimuli / seizures.				
NON CLINICAL BRAIN DEATH TESTING					
List the indications for non-clinical brain death testing	Preconditions are not met.				
What imaging can be used to determine the absence of intracranial blood flow?	Four vessel angiography Radionuclide Imaging CT angiography if four vessel / radionuclide are not available				
When can imaging be undertaken and what patient examination should occur prior to imaging?	Imaging may be undertaken as soon as brain death is suspected. If possible, there should be a minimum of 4 hours observation and mechanical ventilation during which the patient has unresponsive coma, with pupils non-reactive to light, absent cough/tracheal reflex and no spontaneous breathing efforts should occur to increase the likelihood of the study showing no intracranial blood flow. Clinical examination of brain death should be undertaken as far as possible before undertaking blood flow studies to increase the likelihood of the study showing no intracranial flow.				
Who is required to certify brain death on imaging studies?	Two medical practitioners who having examined the patient and are aware of the circumstances of the onset of the coma are assisted in determining brain death by evidence of absence of intracranial blood flow as reported by a radiologist or nuclear medicine specialist It is recommended that neither doctor be the practitioner reporting the blood flow study.				

Professional Elements of Practice	Performance Criteria	Improvement required	Acceptable	Good	Comments
<b>TIME OF DEATH</b>					
When is the time of death?	Death is certified when two medical practitioners as defined in local legislation have both completed the process required to diagnose brain death. Time of death recorded as the time when the second clinician determines that brain death has occurred.				

**Feedback:**