

Document Type: Policy	Ref No: HRS/HPSD/BDD/1/2019	Version Number: 1
Document Title: Brain Death Determination	Effective Date: 1/3/2019	Revision Date: 1/3/2022
Ownership: Health Policies and Standards Department		
Applicability: All Hospitals Licensed by Dubai Health Authority (DHA)		
<p>1. Purpose:</p> <p>1.1. To align with the Dubai Health Authority (DHA) vision, mission and strategic objective, to improve the diagnosis and reporting of brain death.</p> <p>1.2. To ensure the diagnosis of brain death has been carried out as per worldwide standards and international best practices.</p> <p>1.3. To ensure all health facilities comply with the United Arab Emirates (UAE) federal laws and Dubai Health Authority (DHA) policy for brain death.</p> <p>1.4. To facilitate the diagnosis of brain death by the following DHA licensed physicians: Neurologists, Neurosurgeons, Internists, Intensivists, and Anesthesiologists, Pediatricians.</p> <p>1.5. To support organ transplantation at a national level.</p> <p>2. Scope:</p> <p>2.1. The following DHA licensed Healthcare Professionals:</p> <p>2.1.1. Critical Care Consultant (Adult or pediatrics).</p> <p>2.1.2. Neurology Consultant (Adult or pediatrics).</p> <p>2.1.3. Neurosurgery Consultant.</p> <p>2.1.4. Internal Medicine Consultant.</p> <p>2.1.5. Anesthesia Consultant (Adult or pediatrics).</p> <p>2.1.6. Pediatrics Consultant.</p>		

3. Definitions and Abbreviations:

Brain death: Irreversible cessation of all functions of the brain, including the brain stem.

Brain Death by neurological criteria: is defined as the irreversible loss of the capacity for consciousness combined with the irreversible loss of all brain and brainstem functions, including the capacity to breathe. Brain Death determined by neurological criteria is equivalent to the death of the individual, even though the heart continues to beat and spinal cord functions may persist.

Coma: The absence of any cerebrally mediated response to noxious stimuli including pain in all extremities (nail-bed pressure) and in the head (e.g. supraorbital or temporo-mandibular joint pressure). "Spinal" reflexes are consistent with brain death, but decorticate and decerebration posturing are not.

Grandfathering: is an external competent entity which shall oversee and support a health facility to meet the requirements in certain services.

DHA: Dubai Health Authority

EEG: Electroencephalogram

MRP: Most Responsible Physician

4. Policy Statement:

4.1. This policy is applicable from the point of brain function test request by the treating physician till the point of brain death determination.

4.2. The three essential findings in brain death are: coma, absence of brainstem reflexes, and apnea.

4.3. The diagnosis of brain death is primarily clinical.

4.4. The hospital shall ensure it has in place an active morbidity and mortality committee supported by written terms of reference.

4.4.1. The hospital morbidity and mortality committee shall maintain a register of the names of the physicians involved in brain death assessment and diagnosis.

4.5. If the EEG test is not conclusive or the apnea test cannot be performed, then one of the other confirmatory tests is required in compliance with Ministerial decision no. (550) of 2017 concerning the Requirements for Determining Death (**Appendix 1**).

4.6. Determination of brain death shall be performed by a minimum of three (3) DHA licensed physicians as per point 2.1 in this policy.

4.6.1. One of the three (3) physicians shall be an intensive care consultant or anesthesia consultant.

4.6.2. If the number of physicians who are permitted to determine the brain death is less than three (3), a grandfathering approach shall be adopted.

a. Grandfathering shall only be undertaken once both hospitals have signed a Memorandum of Understanding.

b. The nominated hospital to perform grandfathering shall have sufficient and competent physicians who are licensed by DHA or another competent health regulator in the UAE.

c. Grandfathering shall be free from any conflicts of interest that may affect the Determination of brain death (refer to point 4.7 in this policy).

4.7. Organ transplant physicians, and transplant surgeons are not permitted to perform the assessment for brain death determination.

4.8. The ICU physicians shall intensify the management of saving the organs during the critical period of diagnosis the brain death.

4.9. The ICU physicians shall notify the brain death cases as soon as possible to the National Organ Transplantation team, in order to encourage Organ Transplantation in UAE.

4.10. The hospital administration shall facilitate the reassessment of the brain dead patient by the National Organ Transplantation team.

4.11. Pre-requisites for Brain Death Assessment

4.11.1. Prior to requesting the assessment, the Most Responsible Physician (MRP), or his/her deputy, shall ensure that all of the pre-assessment conditions are met. The pre-assessment conditions are:

- a. The patient is in a state of deep coma due to a known reason.
- b. At least six hours have lapsed since the event leading to coma (for adults).
- c. Drug poisoning should be excluded in cases of motor vehicle accidents, suspicious drug poisoning, or coma due to unknown reason. If such screening is not performed, then five days (120 hours) shall elapse from the time an agent was ingested/administered, before brain function assessment can be done.
- d. The patient should not be under the influence of any sedatives, anxiolytics, hypnotics, narcotics, muscle relaxants, central nervous system depressants, or anti-depressants.
 - i. If the history is positive for ingestion/administration of any of above agents, then the influence of such agents should be excluded either by a laboratory test or awaiting five days (120 hours) from the last time an agent was ingested/administered, before brain function assessment can be done.

- e. The patient does not exhibit any spontaneous motor activity (decerebrate or decorticate postures).
- f. The patient does not demonstrate any limb or facial response to applying significant pressure to the supra-orbital rim (central pain).
- g. The patient is not in a cardiovascular shock.
- h. The patient's core temperature is more than 34°C.
- i. The patient is dependent on mechanical ventilation and can't trigger spontaneous ventilation.
- j. Biochemical tests does not indicate metabolic or hormonal derangements.
- k. Absence of any reflexes except for some simple spinal-cord mediated ones (e.g. plantar responses, muscle stretch reflexes, abdominal reflexes, and finger jerks).
- l. The most responsible physician (MRP), or his/her deputy, has informed the guardian or custodian about the assessment and the consequences of confirming brain death.
- m. The consent of the guardian or custodian is not required to perform the assessment.
- n. The MRP, or his/her deputy, makes the request for assessment by filling and signing of the brain functions assessment form (Clinical assessment for diagnosis of brain death as per the Ministerial Decision No. (550) Of 2017).

4.12. Brain Death Assessment

- 4.12.1. Once signed by the MRP, the form will be handed over to the assessing physicians.

4.12.2. The clinical assessment should be performed after the necessary monitoring period (**Appendix 2**). All test results should be documented on the patient's file by the assessing physicians.

4.12.3. Toxicological lab testing shall be done for the following:

- a. Traffic-related.
- b. Drugs-overdose.
- c. All unknown cases and where the physician determines a possible reversible therapy.
- d. If this the above is not feasible, a minimum period of 5 days shall be granted before brain death is considered.

4.12.4. Metabolic or endocrinological abnormalities shall be corrected.

4.12.5. Diagnosis of brain death resulting from complete and definitive cessation of all brain functions.

- a. This diagnosis shall be made using brain signs.
- b. It should be applied to any patient with the characteristics of death using cerebral criteria.

4.13. Diagnosing brain Death Using Brain Criteria

4.13.1. After ascertaining that the above conditions are in place, and excluding what to be excluded:

- a. A clinical assessment shall be carried out as per the Ministerial Decision no. 550, of 2017.

- b. The examining physician shall sign the death diagnosis document and repeat the second assessment after the specified period of observation and then sign the death certificate again.

4.14. Brain death notification

4.14.1. Upon completion of the assessment form (i.e. all the tests in the assessment form and/or the confirmatory tests confirm brain death), the brain death notification shall be signed by:

- a. Three (3) Consultant physicians who are satisfied with the completeness of the brain functions assessment form and that all tests confirm brain death.
- b. The assessment form and the brain death notification shall be uploaded into the hospital patient health record, regardless of the results.
- c. The hospital health information management section shall keep all the forms and notifications, and maintain a registry (regardless of the results).

4.15. Consequence to brain death determination

4.15.1. After the brain death notification form is duly signed, the MRP, or his deputy, should inform the guardian or custodian about the brain death and the consequences.

4.15.2. If the deceased meets the criteria for organ donation, as set by the UAE national organ transplant protocol, then the transplant coordinator should be informed for the necessary actions as per the organ transplant program (**Appendix 4**).

4.15.3. If the deceased doesn't meet the criteria for organ donation or the guardian or custodian doesn't approve the organ transplantation, then life sustaining equipment is withdrawn,

in compliance with article (10) point (2) of the UAE federal decree law no. (4) 2016 on medical liability.

4.15.4. The guardian or custodian shall be informed about the withdrawal, but their consent is not required, in compliance with article (10) point (2) of the UAE federal decree law no. (4) 2016 on medical liability.

4.16. Documentation in the Health Record

4.16.1. The declaration of death by brain death criteria shall be documented in the health record as a death note in a manner similar to any other declaration of death and include the following information:

- a. Etiology and irreversibility of coma.
- b. Absence of motor response to pain.
- c. Absence of brain stem reflexes.
- d. Details of the apnea test, including pre and posttest arterial blood gas values.
- e. Justification for Confirmatory testing, if performed, along with results and name of the attending physician responsible for interpretation.
- f. Results of repeat neurological assessments, if performed.
- g. The date and time of declaration of death.
- h. The name of the consultants that determined death by brain criteria.
- i. Indication that the Medical Examiner was contacted if appropriate.

4.17. Issuance of death certificate

4.17.1. The death certificate shall be filled after the brain death notification is duly signed and either: the organ harvest process is complete as per the organ transplant program or the life sustaining equipment is withdrawn as per pathway in **Appendix 3 and 4.**

5. References

- 5.1. Federal Law No. (4) of 2016; Medical Liabilities; Article 10 and 11.
- 5.2. Federal Decree-Law No. (5) of 2016 on Regulation of Human Organs and Tissue Transplantation.
- 5.3. Ministry of Health and Prevention, Office of the Minister, Ministerial Decision no. (550) of 2017, Death Diagnosis Criteria.
- 5.4. Standardized Critical Care Notification and UAE organ Brain Death Diagnosis Protocol.
- 5.5. Evidence-based guideline update: Determining brain death in adults
<http://www.who.int/service-delivery/safety/ddcr78.pdf>

Appendix 1 - Brain Functions Assessment Form

Section A- REQUEST FOR ASSESSMENT			
Patient Name:		الاسم:	
Age:	العمر:	Gender:	الجنس:
Nationality:	الجنسية:	Blood Group:	فصيلة الدم:
Hospital:		المستشفى:	
Health record No:		رقم الملف الصحي:	
Diagnosis:		التشخيص:	
Date of admission:		تاريخ الدخول:	
Requested by :		مقدم الطلب:	

Section B- CLINICAL ASSESSMENT	First Consultant		Second Consultant	
	Yes	No	Yes	No
FIRST ASSESSMENT				
PREREQUISITES (all must be checked):				
1. It is absolutely certain that irremediable brain damage has occurred due to				
2. More than six hours [^] have passed since the initial insult for initial assessment / or appropriate time have passed between the first and second assessment for re-assessment				
3. Presence of Coma				
4. Absence of severe acid-base, electrolyte, endocrine abnormality				
5. No spontaneous respirations				
6. Normothermia or mild hypothermia (core temperature > 34° C)				
7. Systolic blood pressure ≥ 100 mm Hg				
8. Blood test or hospital record indicate absence of significant levels of sedative drugs or muscle relaxants).				
9. Patient does not demonstrate spontaneous motor activity (decelerate or decorticate postures).				

CLINICAL ASSESSMENT:				
1. Lack of response to stimulation (Spinal reflexes excepted).				
2. Absence of brain stem reflexes (all must be checked):				
a. Absence of Response to central pain				
b. Pupils non-reactive to bright light				
c. Corneal reflex absent				
d. Absence of Oculocephalic reflex (tested only if C-spine integrity ensured)				
e. Absence of Oculovestibular reflex				
f. No facial movement to noxious stimuli at supraorbital nerve, temporomandibular joint				
g. Cough reflex absent to tracheal suctioning				
h. Gag reflex absent				
i. Absence of motor response to noxious stimuli in all 4 limbs (spinally mediated reflexes are permissible)				

First assessment	Date	Time	Physician name	Physician signature
First Consultant				
Second Consultant				
Third Consultant				

Section C- REQUEST FOR ASSESSMENT			
Patient Name:		الاسم:	
Age:	العمر:	Gender:	الجنس:
Nationality:	الجنسية:	Blood Group:	فصيلة الدم:
Hospital:		المستشفى:	
Health record No:		رقم الملف الصحي:	
Diagnosis:		التشخيص:	
Date of admission:		تاريخ الدخول:	
Requested by :		مقدم الطلب:	

Section D- CLINICAL ASSESSMENT Second ASSESSMENT	First Consultant		Second Consultant	
	Yes	No	Yes	No
PREREQUISITES (all must be checked)::				
1. It is absolutely certain that irremediable brain damage has occurred due to				
2. More than six hours* have passed since the initial insult for initial assessment / or appropriate time have passed between the first and second assessment for re-assessment				
3. Presence of Coma				
4. Absence of severe acid-base, electrolyte, endocrine abnormality				
5. No spontaneous respirations				
6. Normothermia or mild hypothermia (core temperature > 34° C)				
7. Systolic blood pressure ≥ 100 mm Hg				
8. Blood test or hospital record indicate absence of significant levels of sedative drugs or muscle relaxants).				
9. Patient does not demonstrate spontaneous motor activity (decelerate or decorticate postures).				

CLINICAL ASSESSMENT:				
3. Lack of response to stimulation (Spinal reflexes excepted).				
4. Absence of brain stem reflexes (all must be checked):				
j. Absence of Response to central pain				
k. Pupils non-reactive to bright light				
l. Corneal reflex absent				
m. Absence of Oculocephalic reflex (tested only if C-spine integrity ensured)				
n. Absence of Oculovestibular reflex				
o. No facial movement to noxious stimuli at supraorbital nerve, temporomandibular joint				
p. Cough reflex absent to tracheal suctioning				
q. Gag reflex absent				
r. Absence of motor response to noxious stimuli in all 4 limbs (spinally mediated reflexes are permissible)				

Section E- Apnea test		
<i>Shall be conducted by the consultant who performed the first assessment:</i>		
Spontaneous respiration absent	Yes <input type="checkbox"/>	No <input type="checkbox"/>
PaCO ₂ ≥ 60 mm Hg, or 20 mm Hg rise from normal baseline value	Baseline value	Follow-up value
Apnea Test Result	Positive <input type="checkbox"/>	Negative <input type="checkbox"/>
Date of test		
Time of test		
Physician Name and Staff ID		
Physician signature & stamp		

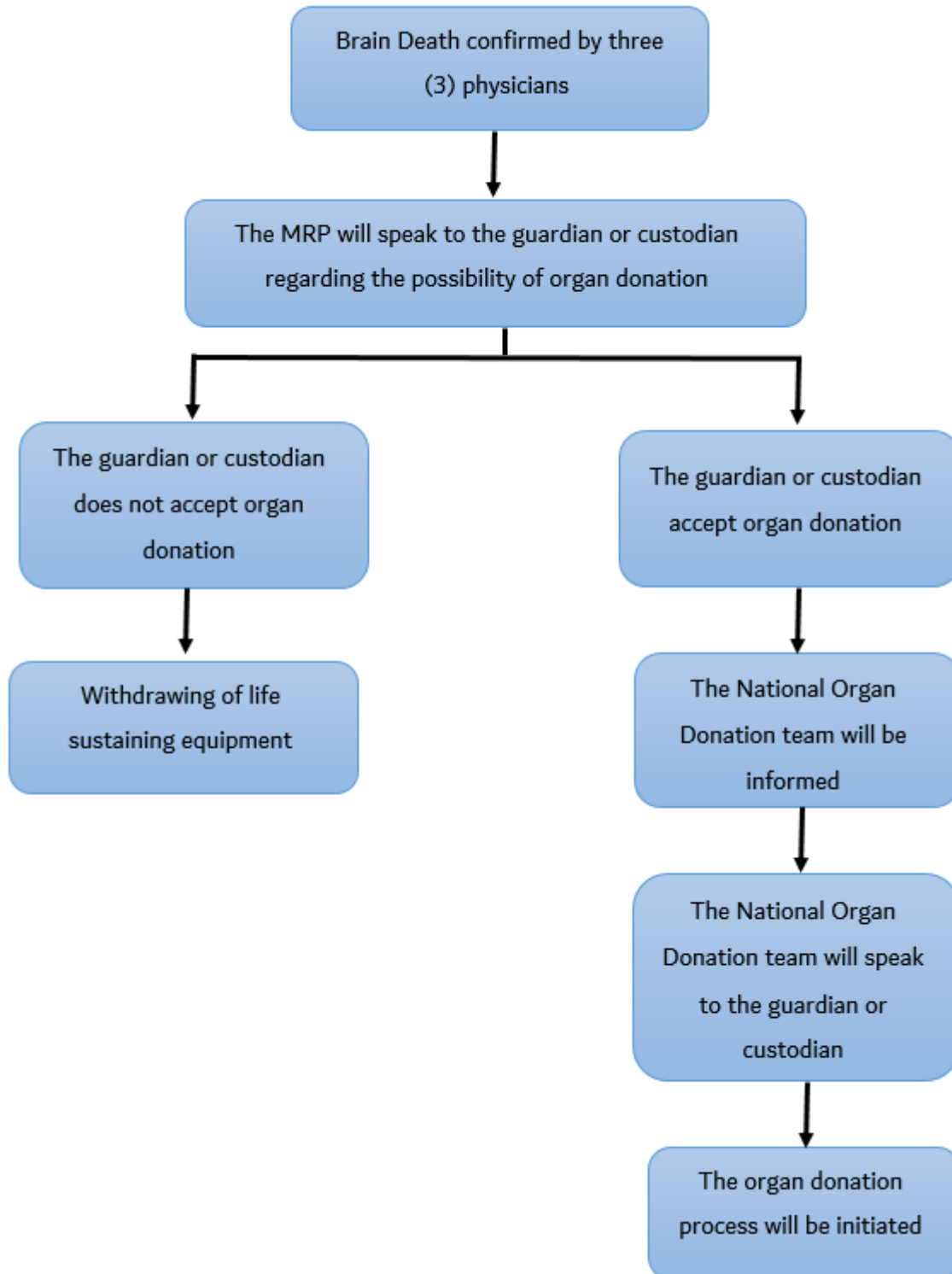
Section F- CONFIRMATORY TESTS				
Electro-encephalogram (EEG)	EEG 1		EEG 2 (if applicable)	
	Isoelectric Pattern	Yes <input type="checkbox"/>	Isoelectric Pattern	Yes <input type="checkbox"/>
		No <input type="checkbox"/>		No <input type="checkbox"/>
Date	Time	Date	Time	
Absence of brain circulation evidenced by either: <input type="checkbox"/> Cerebral angiography <input type="checkbox"/> Cerebral Scintigraphy <input type="checkbox"/> Radionuclide angiography <input type="checkbox"/> Transcranial Doppler	Presence of cerebral blood flow			
	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Date	
			Time	
<input type="checkbox"/> Brain stem evoked potential	Yes <input type="checkbox"/>	No <input type="checkbox"/>		

Final Assessment	Date	Time	Physician name	Physician signature
First Consultant				
Second Consultant				
Third Consultant				
Hospital stamp				

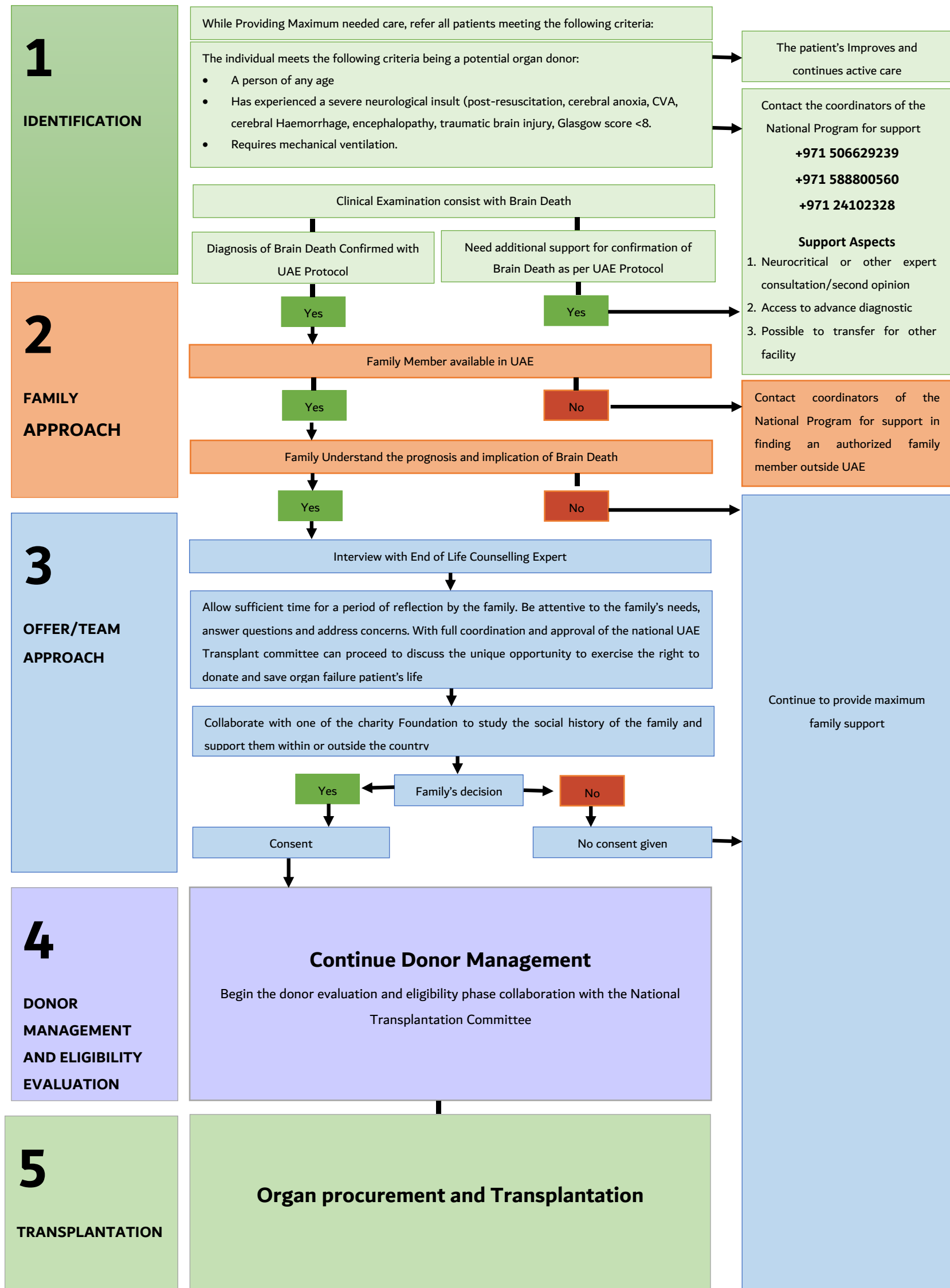
Appendix 2 – Brain Death Assessment

Age Groups	Required interval between the first and second clinical assessment
Age (7 to 60 days)	
First assessment by three consultants	
EEG	
Second assessment by same three consultants	48 hours
EEG	
Apnea test by one of the above consultants	
Age (61 days to 1 year)	
First assessment by three consultants	
EEG	
Second assessment by same three consultants	24 hours
EEG	
Apnea test by one of the above consultants	
Age (>1 – 18 years)	
First assessment by three consultants	
EEG	
Second assessment by same three consultants	12 hours
Apnea test by one of the above consultants	
Age (>18 years)	
First assessment by three consultants	
EEG	
Second assessment by same three consultants	6 hours
Apnea test by one of the above consultants	

Appendix 3-Pathway after confirmation of brain death



Appendix 4- Standardized Critical Care Notification and UAE organ Brain Death Diagnosis Protocol



Appendix 5- Withdrawing of life sustaining equipment form

Withdrawing of life sustaining equipment should be signed by at least two of the three doctors who did the clinical assessment plus the medical director.

Patient name:	
Age:	Gender:
Nationality:	Health Record No.:
Diagnosis:	

This document is to confirm that the above named patient is declared brain dead.

Hence, the life sustaining equipment will be withdrawn.

Physician (1) Name:							
Title:							
Staff ID		Date				Time	
Physician (2) Name:							
Title:							
Staff ID		Date				Time	
Physician (3) Name:							
Title:							
Staff ID		Date				Time	

Hospital Name:							
Medical Director Name:							
Title:							
Staff ID		Date				Time	