

Diagnosis of death using neurological criteria

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Warm up questions

1. A patient has a set of neurological tests and then their organs are donated. What is the correct term for this patient?
2. Below what age can you not be declared dead by neurological criteria?
3. What is the commonest form of RRT in CKD over the last 5 years?
4. In this scenario how do you test the vestibulo-ocular reflex?

Definition of death

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- The irreversible loss of the capacity for consciousness, combined with irreversible loss of the capacity to breathe.

What do we need in advance?

What do we need?

1. Evidence of irreversible brain damage of known aetiology.
 2. Exclusion of reversible causes of coma and apnoea
 3. Equipment
- Always mention Specialist nurse for organ donation

Red Flag patient groups?

Red Flag patient Groups

1. Testing <6 hrs of the loss of reflexes
2. Testing <24 hrs loss of reflexes due to hypoxia
3. Hypothermia
4. Neuromuscular disorders
5. Steroids with SOL
6. Prolonged fentanyl infusions



FENTANYL
mcg/mL



Drs?

Drs

- Both registered with GMC >5 years
- At least one a consultant
- No conflicts of interest. Especially member of transplant team.
- One performs and the other observes, on two different occasions
- Time of death is end of first set of tests

Physiological pre requisites

- B: PaCO₂<6.0kPa PaO₂>10kPa#
- C: MAP>60mmHg (fluid/vasopressors)
- D: Na⁺115-160mmol/L (desmopressin1-2mcg)
- E: pH: 7.35-7.45
- K⁺>2, PO₄⁻ > 0.5-3, Mg²⁺ 0.5-3, Glucose 3-20.

In Children

Not applicable in children <37 weeks post menstrual age

One of the doctors a specialist in children

One of the doctors not involved in the patients care

The specific tests

- II, III: Pupils react to light
- V, VII: Corneal reflex
- III, VI, VIII: Vestibulo-ocular reflex
- IX, X: Gag reflex
- IX, X: Cough reflex
- V, VII, spine/trunk reflexes; Supra-orbital pressure

The apnoea test

- Pre-oxygenated
- PaCO₂ to start from over 6.0kPa (6.5 in chronic retainers).
- PaCO₂ to increase by over 0.5kPa
- Mapelson C or tracheal catheter O₂
- No spontaneous respiration

Ancillary investigations

- Not required for diagnosis via neurological criteria.
- Of use where neuro exam limited;
 - Cranio facial injuries
 - Excessively sedated
 - High cervical injury

Ancillary 2

- Neurophysiological
 - EEG, Evoked potentials
- Clinical
 - Atropine, no \uparrow HR. Absent Dolls eye.
- Radiological
 - Absent flow or tissue perfusion.
 - Eg. 4 vessel angiography.

Physiological changes associated with brainstem death?

Structure	Response
Brainstem Ischaemia, Catecholamine release	Increased HR/BP/SVR/PVR
Reflex baroreceptor response	Bradycardia
Herniation and vasomotor destruction	Vasodilatation, Bradycardia, asystole.
Pituitary ischaemia	Diabetes Insipidus

References

- FICM long form for neurological criteria for diagnosis of death
- BJA 2020, pitfalls in diagnosis of death using neurological criteria
- An Ethical Framework for Controlled Donation After Circulatory Death. Consultation. UK Donation Ethics Committee. Academy of Medical Royal Colleges, 2011
- NHS Blood and Transplant
- BJA Common pitfalls in neurological criteria for death 2020

Thank you and good luck