MUNI MED

ORGAN DONATION

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Educational outcome:

- identify potential organ donor
- understand what si the definition of neurological death
- understand what are the prerequisites before testing
- know what tests are used to confirm neurological death



Introduction:

- Organ transplantation is a recognised treatment for end organ damage
- It is an altruistic act of beneficence resulting in the gift of life

- transplantation is life-enhancing for pancreatic and renal diseases
- transplantation is life- saving for end stage heart, lung and liver diseases



Donor identification:

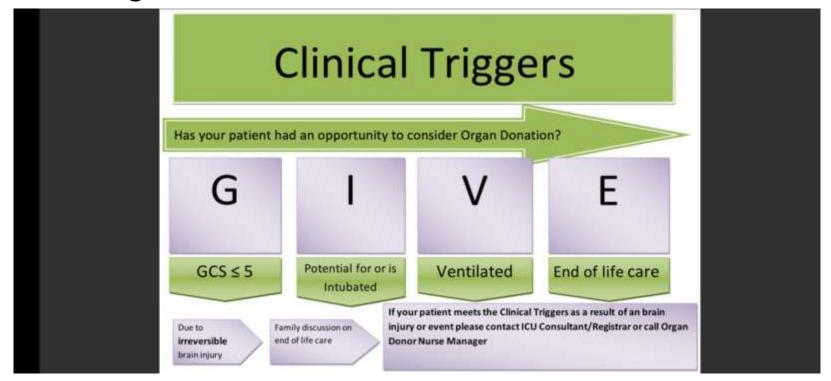
- Defined clinical trigger factors in patients who have had a catastrophic brain injury.
- The absence of one or more cranial nerve reflexes and a Glasgow Coma Score of 5 or less, which is not explained by confounders.

- GIVE score
- AE, ICU, neurology/stroke units



Donor identification:

 A consistent clinical indicator used for the early identification of potential organ and tissue donors





Criteria for organ donation:

 the process of organ donation places a huge importance on the balance of risk and benefit to the recipient

- potential organ donor (family) /potential organ recipient
- primary team /ICU / neurology/ surgeons/ organ donation coordinator......

 suboptimal transplant outcomes :graft dysfunction , disease transmission, recipienté death



Criteria for organ donation:

absolute contraindications:

- no consent from next of kin
- no consent from coroner (IRL/UK) cause of death
- family dissent/conflict about donation
- advanced-stage disease (colon stage > T3 or breast > T1c)



Criteria for organ donation:

relative contraindications to donation :

 sepsis, HIV positive, systemic viral infection, herpetic meningoencephalitis, neoplasms (lymphoma, malignant melanoma,...), lung cancer, glioblastoma,

 <u>early stage disease cancers</u> (bowel and breast) can be <u>acceptable</u> for organ donation depending on staging and the disease- free interval



Neurological death DBD (donation after brain death):

definition :

- the irreversible loss of consciousness due to a known cause
- loss of brain reflexes
- apnoea in the presence of respiratory acidemia



Neurological death:

- aetiology:
- cerebral haemorrhage, cerebrovascular embolism, hypoxic brain injury, , traumatic brain injury, meningitis, brain tumour, epilepsy, brain abscess, hydrocephalus,...

- tests :brain stem test apnoea test
- ancillary tests radiology, audiometry, EEG, transcranial Doppler



Neurological death – prerequisites:

- known cause of death
- drug free state no sedatives, no muscle relaxants, no anesthetic agents, alcohol, opiods,....

- normothermia > 36 °C
- avoid electrolyte imbalance, Na 130-155mmol/L, normal blood glucose levels,

no endocrine imbalance



Brainstem tests, apnoea test:

Table 2 Brainstem death tests

Brainstem reflex tests				
Test	Cranial nerve		Test details (brainstem level)	Response in brainstem death
	Sensory	Motor		
Pupillary response	II	ш	A bright light is shone into each eye in turn. Direct and consensual reflexes should be sought (mid brain)	Absence of pupillary constriction
Corneal reflexes	V	VII	The cornea is brushed lightly with a swab (pons)	No blinking
Oculo-vestibular reflexes	VIII	III, IV, VI	50 ml of ice cold saline is instilled into the external auditory meatus over 1 min. The tympanic membrane should be visualized by otoscopy before testing. Both sides should be tested, though inability to perform the test on one side does not invalidate the test (pons)	No eye movement
Response to painful stimulus	v	VII	Painful stimulus is applied to the supra-orbital ridge (pons), and also to the limbs and trunk	No motor response in the cranial distribution
Gag reflex	IX	X	The pharynx is stimulated with a spatula or similar device (medulla)	No gag or pharyngeal contractions
Cough reflex Apnoea test	X	X	A bronchial catheter is passed to the carina (medulla)	No cough

The apnoea test should only be performed once the absence of brainstem reflex activity has been confirmed. The aim is to produce an acidaemic respiratory stimulus (pH<7.4) without inducing hypoxia or cardiovascular instability. This applies to those with chronic respiratory disease, though the Paco, required to achieve this may be higher

- Increase F_{1O2} to 1.0
- 2. Perform arterial blood gas analysis to calibrate E'CO, and SpO2
- 3. Reduce minute ventilation until E'CO, reaches 6.0 kPa and pH is 7.4. Spo, should be greater than 95%
- 4. Maintain apnoeic oxygenation by either instilling 5 litre min 1 O2 into the lungs with a suction catheter or with CPAP
- 5. Observe for respiratory activity for 5 min
- 6. Confirm an increase in PaCO2 of more than 0.5 kPa using blood gas analysis

After completion of the apnoea test, the ventilator should be reconnected. Acid-base status should be normalized before second set of tests

Curran Emer, 2020, Irish Organ Donation Handbook app, vrsion 5.10, MEG Software



ICU managment of potential organ donor:

- ICU principles :
- maintain euvoleamia
- optimise cardiac output
- lung protective ventilation

- diabetes insipidus- Na/UO/
- prevent hypothermia
- glyceamia control, (thyroid hormones, glucocortikoids, ...)



Donation after circulatory death (DCD):

 DCD – refers to the retrieval of organs for the purpose of transplantation from patients whose death is diagnosed and confirmed using <u>cardio-respiratory criteria</u>

- controlled /uncontrolled expected /unexpected
- ICU, stroke unit /emergency department, out of hospital
- UK, Australia /France, Spain both Netherlands



Perioperative management:

- maintain clinical targets as in "normal" patient
- no need for opiods
- muscle relaxants usually needed
- low dose of sevoflurane (inhalational anesthetics) improves outcome



Family approach:

principles

Care of the dying patient is of paramount importance!!!

 Measures to maintain the comfort and dignity of the patient must not be compromised for organ donation



Family approach:

use clear language

- obtain the patient's clinical history
- identify key family members
- identify key family issues, including the need for family support
- identify relevant cultural and religious issues

all religions support the ethos of organ donation



Donor identification summary:

Critical pathways for organ donation

Possible deceased organ donor A patient with a devastating brain injury or lesion or a patient with circulatory failure and apparently medically suitable for organ donation Donation after circulatory death (DCD) Treating physician Donation after braindeath (DBD) to identify/refer a potential donor Potential DCD donor Potential DBD donor A person whose circulatory and respiratory Reasons why a potential donor A person whose clinical condition is suspected to functions have ceased and resuscitative does not become a utilized donor fulfill brain death criteria. measures are not to be attempted or continued. System Failure to identify/refer a potential or eligible donor B. A person in whom the cessation of circulatory Brain death diagnosis not confirmed and respiratory functions is anticipated to occur (e.g. does not fulfill criteria) or completed within a time frame that will enable organ (e.g. lack of technical resources or clinician recovery. to make diagnosis or perform confirmatory tests) Circulatory death not declared within the appropriate Eligible DBD donor Eligible DCD donor Logistical problems (e.g. no recovery team) A medically suitable person who has been A medically suitable person who has been Lack of appropriate recipient (e.g. child, blood type, declared dead based on neurologic criteria as declared dead based on the irreversible absence serology positive) stipulated by the law of the relevant jurisdiction. of circulatory and respiratory functions as Donor/Organ stipulated by the law of the relevant jurisdiction, within a time frame that enables organ recovery. Medical unsuitability (e.g. serology positive, neoplasia) Haemodynamic instability/unanticipated cardiac Actual DBD donor Actual DCD donor Anatomical, histological and/or functional A consented eligible donor: A consented eligible donor: abnormalities of organs In whom an operative incision was made A. In whom an operative incision was made Organs damaged during recovery with the intent of organ recovery for the with the intent of organ recovery for the Inadequate perfusion of organs or thrombosis purpose of transplantation. purpose of transplantation. Permission B. From whom at least one organ was Expressed intent of deceased not to be donor B. From whom at least one organ was recovered for the purpose of transplantation. recovered for the purpose of transplantation. Relative's refusal of permission for organ donation Refusal by coroner or other judicial officer to allow donation for forensic reasons Utilized DBD donor Utilized DCD donor An actual donor from whom at least one organ An actual donor from whom at least one organ was transplanted. was transplanted



The "dead donor rule" must be respected That is, patients may only become donors after death, and the recovery of organs must not cause a donor's death

Take home message:

- existence of organ donation program
- organ donation program is a multidisciplinary task
- dealing with a family is very delicate matter



thank you

