Organ Donation: Brain Death and Cardiac Death

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Objectives

- List clinical triggers for contacting UNYTS
- Define brain death
- Define donation after cardiac death
- Describe why DCD is a worthwhile goal
- Outline the process for DCD donation
- Discuss controversies in DCD

Upstate New York Transplant Services (UNYTS)

- Federally designated Organ Procurement Organization (OPO) for Western N.Y.
- Non–profit organization
- Responsible for the recovery and allocation of donor organs and tissues at all 28 hospitals in the 8 counties of our service area.
- Provides on–call donation services 24/7/365

Federal Regulations

- **Centers for Medicare and Medicaid Services (CMS)**
  - Conditions of Participation to receive Medicare funding
- **Joint Commission on Accreditation of Healthcare Organizations (JACHO)**
- **Similar, <u>key requirements:</u>**
  - Agreement w/ an OPO, tissue and eye bank
  - Call on every death and imminent death
  - Provide option of donation to family of every medically suitable patient
  - Family approach by OPO staff

History and Facts

- As of today 105,499 people are on the waiting list for an organ transplant
- 23,847 transplants in 2009
- 17 - 20 people die waiting every day—new name added to the list approximately every 15 minutes

Clinical Triggers: All Potential Donors

- Every ventilated patient meeting any of the following:
  - GCS 5 or less w/o continuous sedation
  - Brain death testing planned or initiated
  - Patient being made comfort care – PRIOR TO
  - Life sustaining therapy to be withdrawn – PRIOR TO
- Every cardiac death (within 1 hour)

Brain death

- Most common type of organ donation
- Brain death criteria established in 1970's in response to
  - Development of ventilator therapy
  - Development of organ donation

Responsibilities of Physicians Determining Brain Death

- Evaluate the irreversibility and potential causes of coma
- Initiate hospital policy for notifying NOK
- Conduct and document 1st clinical assessment of brain stem reflexes
- Observe during defined interval

Responsibilities of Physicians Determining Brain Death

- Conduct and document second clinical assessment of brain stem reflexes
- Perform and document apnea test
- Perform confirmatory testing if indicated
- If religious or moral objection to brain death standard, implement hospital policy for reasonable accommodation

Responsibilities of Physicians Determining Brain Death

- Certify brain death
- Withdraw cardio-pulmonary support in accordance with hospital policies, including those for organ donation

TABLE 1. CLINICAL CRITERIA FOR BRAIN DEATH IN ADULTS AND CHILDREN.

Coma
Absence of motor responses
Absence of pupillary responses to light and pupils at midposition with respect to dilatation (4–6 mm)
Absence of corneal reflexes
Absence of caloric responses
Absence of gag reflex
Absence of coughing in response to tracheal suctioning
Absence of sucking and rooting reflexes
Absence of respiratory drive at a $PaCO_2$ that is 60 mm Hg or 20 mm Hg above normal base-line values*
Interval between two evaluations, according to patient's age
  Term to 2 mo old, 48 hr
  >2 mo to 1 yr old, 24 hr
  >1 yr to <18 yr old, 12 hr
  ≥18 yr old, interval optional
Confirmatory tests†
  Term to 2 mo old, 2 confirmatory tests
  >2 mo to 1 yr old, 1 confirmatory test
  >1 yr to <18 yr old, optional
  ≥18 yr old, optional

*$PaCO_2$ denotes the partial pressure of arterial carbon dioxide.
†See Table 2 for descriptions of the available confirmatory tests. Tests may be required by law outside the United States.

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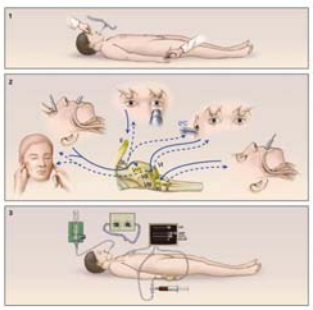
The Steps in a Clinical Examination to Assess Brain Death



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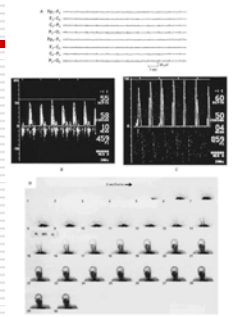
Confirmatory Testing for Determination of Brain Death

- Cerebral Angiography
- EEG
- Transcranial Doppler
- Cerebral Scintigraphy

Examples of Bedside Tests to Confirm Brain Death



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DCD:History and Facts

- Institute of Medicine studied organ transplantation starting in 1996 and concluded:
  - Organ recovery following cardio-pulmonary death can positively impact the shortage of transplantable organs

History and Facts

- Prior to the acceptance of the "brain death" criteria in the mid-1970s, all organ donations were performed after cessation of cardiopulmonary function.
- In 1999, 68 of "Donation After Cardiac Death (DCD)" cases were accomplished across the United States.
- In 2006, 322 DCD cases were accomplished.

Fundamentally…

- The family should make the decision to withdraw life support independent of, and prior to, any discussion regarding organ donation.

Criteria

- The patient has a non recoverable illness or injury and has suffered neurologic devastation.
- The family, in conjunction with the medical staff, has decided to withdraw life support.
- Death will likely occur within <u>one hour</u> of withdrawal of life support.

Potential DCD Donor

- Patients with severe neurological injury
  - ***Intracranial hemorrhage, stroke, anoxia, trauma***
- Patients without neurological injury
  - ***Degenerative neuromuscular diseases***
  - ***End-stage cardiopulmonary diseases***

Potential DCD Donor (cont'd)

- Do not meet the criteria for brain death
- No chance for survival off the ventilator
- Family elects to deescalate care or withdraw support (DNRs)

Clinical Triggers: Potential DCD

- Illness or injury has caused an unrecoverable, neurological or physiological devastation resulting in ventilator dependency.
- Death from cardiac arrest likely to occur within one hour following withdrawal of mechanical support.
- Family has made patient DNR or plans to withdraw all life support
- Family inquired or initiated discussion about organ donation

Process

- Refer the patient to UNYTS.
- A coordinator will come on site and evaluate the patient to determine suitability.
- In conjunction with the health care team, the family will be informed of the patient's suitability.
- If suitable, the family will be fully informed about all procedures relating to the pronouncement of death and the organ recovery process by UNYTS

Patient Management

- The patient will continue to be supported hemodynamically and on a ventilator until withdrawal of support.
- Standard comfort measures will be given at the discretion of the attending physician or their designee.
- UNYTS will provide recommendations for donor management and lab studies to be approved by the attending physician or their designee.

Withdrawal of Support

- A UNYTS DCD consent form will be signed by the next-of-kin.
- Removal of life support usually takes place in the O.R.
- Organ recovery occurs 5 minutes after asystole/pronouncement of death

Pronouncement of Death

- The patient will be pronounced dead after 5 minutes of asystole or 5 minutes of ventricular fibrillation measured by electrical activity and arterial pulse monitoring.
- Death will be pronounced by a physician or designated nursing staff.
- The physician certifying death *may not* be involved in the recovery or transplantation of the organs.
- The physician will record the date and time of death in the medical record and, if applicable, complete the death certificate.

What Happens if the Patient does not Expire?

- Occurs in approximately 5-10% of DCD cases
- If the patient does not arrest within a time deemed suitable by the organ recovery team, the patient will be returned to a prearranged room and provided with comfort measures.
- UNYTS will be responsible for the costs relating to the evaluation and recovery of organs regardless of whether the organs are recovered.

Important Facts to Remember

- The family should make the decision to withdraw life support independent of the decision to donate organs.

Important Facts to Remember

- This procedure should not be viewed as a way to circumvent brain death criteria but as a means to provide families with an additional option of donation that complies with the patient or authorized family directives.

Important Facts to Remember

The Institute of Medicine's evaluation of the ethics of DCD stated that the procedure "should be considered a reasonable source of organ donors."

Points for debate

When is autoresuscitation not possible?

- ***For DCD***
  - In study of 108 patients, did not occur after 2 minutes
- ***Against DCD***
  - Case reports of "Lazarus Phenomenon"- spontaneous autoresuscitation >10 min after CPR stopped

When is the heart's being stopped considered irreversible?

- ***For DCD***
  - Since all DCD patients are DNR patients, loss of circulation is irreversible when autoresuscitation cannot occur (after 5 min)
- ***Against DCD***
  - Loss of circulation is irreversible only after CPR would not be successful in restarting the heart (>15 min)

When is the patient brain dead?

- ***For DCD***
  - Brain death is only one of 2 accepted criteria for defining death. Cardiac death is a well recognized definition of death.
- ***Against DCD***
  - Brain death may not be diagnosed for at least 15 min after heart and circulation stop

Conflict of interest?

- ***For DCD***
  - Doctors give their patient's best interests priority in making decisions
- ***Against DCD***
  - Familiarity and desire for transplantation may make doctors unintentionally biased to promote DCD