

# Ethics of Organ Donation After Cardiac Death

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# DCD Organ Donation

- A large disparity exists between the number of patients needed transplants and the number of organs donated
- Brain death criteria were created to allow organ removal from patients who did not meet strict biological definitions of death, but who were felt to meet social criteria for death
- Recently, DCD organ donation has been used to allow removal of organs from willing donors whose deaths can be planned in concert with withdrawal of life support

# How fast is demand for organs for transplant increasing?

During the time it takes to hear this presentation, the number of persons listed for transplant in the U.S. has increased by approximately 15 persons, and the number of donors by only 1.

- This process raises ethical questions:
  - Potential corruption of quality of end-of-life care and devaluing of dying patients
  - Potential violation of the “dead donor rule”
  - Potential for re-drawing the definitions of death to make organ procurement more convenient
  - Potential for hastening death to preserve organ function
  - Is the benefit to be gained worth potential for morally ambivalent actions

# Historical Perspectives

- Ischemic time limited the use of some organs from cadavers
- Invasive and expensive interventions were prolonging life in a large number of patients in whom patients and families wanted to forgo intervention
- The Ad hoc committee of the Harvard Medical School published brain death criteria in 1968

# Purpose of Defining Brain Death

- Forgo interventions in patients who did not want them and free up limited resources to more salvageable patients
- Allow declaration of death prior to cessation of circulation to allow transplantation of viable organs
- Avoid prosecution of doctors for homicide

# Definitions of Death

- Complete and irreversible cessation of cardiopulmonary circulation
- Complete and irreversible cessation of whole brain function

# Positives of the Brain Death Definition

- Clear, medically definable criteria
- Amenable to clinical and medical testing
- Repeatable results--the Collaborative Study of Stroke in 1980 confirmed no one who met the definition survived



# Problems with Brain Death

- Not readily identifiable by the patient's loved ones
- Requires trust in the physician's competence, honesty, and conscientiousness
- Mistakes have been made, and physician competency with brain death declaration varies
- Doesn't solve the problem of organ shortage

DCD combines two ethically complex events: care of the donor at the end of their life, and the generous gift of organ donation. At the center of this intersection lies potential for conflict, confusion, misunderstanding and error.

# Several Ethical Controversies

- Does the principle of “double effect” apply?
- Is it ethical to administer drugs to preserve organ function that might hasten the death of the donor?
- How do we define when death has occurred (an organ procurement can take place)?

# Hastening Death

- Phentolamine and heparin
- Ethical principles against killing
  - Special exceptions
- Principles of double effect
  - Intention is everything

# Intention

- Why is it such an important aspect of moral action?

What's so wrong with even intending an 'early' death if the outcome is to save a life?

- Utilitarianism
- Deontology

# Deontology

- What is right is based on a “higher” good. Some things are intrinsically right or wrong, irrespective of the outcome. Intention is important.
- Killing is wrong regardless of context, but may be subject to mitigating circumstances that lessen the ‘evil,’ such as intent.

# Utilitarianism

- Rightness or wrongness is judged almost solely by the outcome.
- ‘Best good for the most people’
- Individualistic experience and values are secondary to the ‘greater good.’



- Deontology is the type of ethic emphasized in dealing with individual patients
- Utilitarianism is the type of ethic emphasized in public policy

# Drugs that Hasten Death

- May be ethical to do if the donor gives his or her permission to potentially shorten their life to preserve the organs
- It will depend on the goals of the donor at the end-of-life, which can only be determined through dialogue

# Double effect

- An act intended to produce one outcome (beneficence) produces an *unintended* harm (maleficence).
- Example: administration of increasing doses of narcotics in a moribund cancer patient for the purpose of controlling pain, depresses respiration and causes more rapid death.

# Declaration of Death

- Shortest period of cardiac arrest that is permissible, for the purpose of shortening ischemic time
- Adequate interval of interrupted circulation to assure that the donor is “dead”
- But what is “dead?”

# Death

- Biological state that is mutually exclusive with life (that is, one is either dead OR alive)
- Irreversible

# CPR

## Eliminated 2 assumptions about asystole

- 1) Cardiac arrest is *not* irreversible under many circumstances
- 2) Although unconsciousness occurs rapidly under conditions of cardiac arrest, irreversible brain injury can take variable, and sometimes prolonged, periods to develop

# Irreversibility

- A required feature of the definition of death
- Individuals that have been revived are said to have been “near death,” but not biologically dead.

# Irreversibility--What is the Evidence?

- Pittsburgh physicians chose 2 minutes of asystole
- Canada--5 minutes
- Sweden--10 minutes



# Pittsburgh

- Based on evidence in about 180 patients that “auto-resuscitation” did not occur after 2 minutes of asystole.
- But were they right?

# Human Cases

- Of 5 “studies” cited involving 110 patients
- All were observational cases
- No consistency of selection criteria, underlying disease, age of patients or cause of arrest
- Resuscitation measures not controlled for
- Monitoring was for variable length of time, many cases not stated, or between 1-3 minutes, calling into question conclusions that auto-resuscitation did not happen

- In one case cardiac activity continued for 6-35 minutes after other clinical signs of death had occurred.
- Studies included some from years 1912, 1924, and 1970; monitoring methods varied widely
- One study concluded that the ECG “terminated” in VF or VT, and monitoring terminated before the occurrence of asystole

- 1998 case report of SROC 30 minutes after asystole documented following CPR, by ECG and intra-arterial BP monitoring. Patient survived for 2 days.
- 1994 report of ER patient in hyperkalemic asystole for 26 min, 8 min after resuscitation ended, SROC. Patient discharge home neurologically intact

- Adhiyaman V et al. reviewed the literature from 1982-1998
  - 38 case reports ages from 35-87
  - Time from termination of resuscitation to SROC ranged from 3-45 minutes
  - Survival after SROC ranged from minutes to >180 days
  - Functional recovery occurred in 8 cases

# Continued

- ROSC returned within 10 minutes for 23 of 28 patients in which that time was known
- ROSC times were unknown in 10 cases, including one patient found moving in the morgue
- 45% had good neurological recovery

# Continued

- *35% were discharged home with no significant neurological sequelae*
- 45% died shortly after ROSC
- 10% outcome unknown

# Study Conclusions

- Little is understood about ROSC and survivability
- Neurologic function and recovery persists after prolonged cardiac arrest
- No declaration of death should be made following cardiac arrest until  $> 10$  minutes of observation of asystole



The time-honored criteria of  
stoppage of the heartbeat and  
circulation are indications of  
death *only when they persist  
long enough for the brain to die.*

WH Sweet, NEJM 1978 299:410-2

- Adhiyaman V, et al 2002 J R Coll Phys Edinb; similar review with 28 cases
- No correlation with time to ROSC and neurologic recovery
- 30% of cases associated with significant neurologic recovery
- From this small number of cases, no prognostic factors for recovery could be identified

# Conclusions

- Autoresuscitation (AR) is underreported
- Physicians may be reluctant to report due to medico legal implications (Port Angeles case)
- AR may occur much later than 2 minutes
- Full recovery after AR has been reported in a surprisingly large number of cases
- Brain activity during these events has not been studied
- Patients who are approached about DCD must be fully informed of these facts if true informed consent is to be obtained

Is irreversible ethically  
equivalent to “will not be  
reversed?”

# Answer: no

- Intention is not the same in the two situations
- Death is a biological state; death and life are mutually exclusive states. This definition allows the patient to be both, depending on the intention
- The definition confuses a *prediction* of death with a *definition* of death.

- If the definition of death includes the intentions and goals of a 3rd party (and not merely the biological state of the patient), then the definition becomes a pronouncement of social convenience.

## Death is irreversible: DCD donation requires reconsideration and evaluation of 2 questions:

- Further work to determine when a scientifically based, reproducible and consistent point occurs after asystole after which cardiopulmonary arrest is irreversible irrespective of the motivations of 3rd parties, or
- The transplant community must admit that they have already abandoned the dead donor rule.

# Summary

- DCD was developed as an answer to a disparity between supply and demand for transplantable organs, but has resulted in minimal affects on this disparity
- DCD connects two ethically complex events: the decision to withdraw life-sustaining interventions, and the decision to donate organs for transplantation



# Summary, cont.

- Beneficial effects of DCD include a sense of purpose and meaning at the end of life, and the saving the lives of others
- Potential harms include degradation of end-of-life care, erosion of patient dignity, diminishment of respect for vulnerable living human beings, objectification of living persons, harm to the physician-patient relationship, and increased reluctance to donate organs

# Summary, cont.

- Specific moral controversies that have been inadequately addressed include the administration of potentially death-hastening medications that do not benefit the donor without donor consent and
- Manipulation of the definition of death for the convenience of organ procurement

# Summary, cont

- Physicians are ethically obliged to either
  - supply scientifically provable, reproducible, and consistent criteria for defining true irreversibility of circulation and brain function, even if some organs become unsuitable for transplantation
  - Or admit to potential organ donors that they have abandoned the dead donor rule