

Commentary

Organ donation after circulatory death: the forgotten donor?

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Abstract

Donation after circulatory death (DCD) can be performed on neurologically intact donors who do not fulfill neurologic or brain death criteria before circulatory arrest. This commentary focuses on the most controversial donor-related issues anticipated from mandatory implementation of DCD for imminent or cardiac death in hospitals across the USA. We conducted a nonstructured review of selected publications and websites for data extraction and synthesis. The recommended 5 min of circulatory arrest does not universally fulfill the dead donor rule when applied to otherwise neurologically intact donors. Scientific evidence from extracorporeal perfusion in circulatory arrest suggests that the procurement process itself can be the event causing irreversibility in DCD. Legislative abandonment of the dead donor rule to permit the recovery of transplantable organs is necessary in the absence of an adequate scientific foundation for DCD practice. The designation of organ procurement organizations or affiliates to obtain organ donation consent introduces self-serving bias and conflicts of interest that interfere with true informed consent. It is important that donors and their families are not denied a 'good death', and the impact of DCD on quality of end-of-life care has not been satisfactorily addressed to achieve this.

Introduction

A mandatory implementation of donation after circulatory death (DCD) from eligible patients facing imminent or cardiac death in hospitals across the USA was introduced at a national conference and is to be effective from January 2007 [1]. The DCD requirement is focused on patients who are neurologically intact or do not fulfill neurologic death criteria before withdrawal of ventilator support [2]. The mandatory requirement will be implemented through the collaboration of the Institute of Medicine, Joint Commission on Accreditation of Healthcare Organizations, Center for Medicare and Medicaid Services, and the Department of Health and Human Services (see the glossary of terms in Table 1) [3,4].

The transplantation community has been reorganized into 58 donation service areas (DSAs) to cover the entire country [5]. Each DSA is centered on one organ procurement organization (OPO) that facilitates the recovery and flow of transplantable organs from donor hospital(s) to regional transplant center(s) within a defined geographic location. Each of the DSAs will have to meet a target goal of 75% or higher of cadaveric organ donation rate from its affiliated hospitals.

Determination of circulatory death for organ procurement

The uniform determination of death relies on irreversible cessation of circulatory or neurologic function. The unitarian determination of death by either neurologic or circulatory criteria rather than fulfilling both criteria simultaneously is accepted as the standard for cadaveric organ procurement [2]. The DCD criteria relies on expert opinion, which permits the procurement process after 5 min of apnea, unresponsiveness, and pulselessness [6].

The pivotal assumption that DCD will eliminate the possibility that the procurement process is the direct cause of death has been challenged. Spontaneous return of both circulatory and neurologic function (autoresuscitation or Lazarus phenomenon) has been reported after 10 min of electric asystole [7]. The notion of a specific time interval for determination of irreversible cessation of circulatory function is also difficult to reconcile with the dead donor rule, when extracorporeal circulation and oxygenation during procurement are used to maintain organ viability in DCD [8]. Return of full neurologic function during extracorporeal circulation is well documented in victims of in-hospital and out-of-hospital cardiac arrest, because they are neurologically intact before circulatory death [9,10]. Artificial circulatory

DCD = donation after circulatory death; DSA = donation service area; EOL = end-of-life; ICU = intensive care unit; OPO = organ procurement organization.

Table 1

Glossary of terms used	
Term	Details
Center for Medicare and Medicaid Services	A government agency in charge of providing health care and services to the elderly (≥65 years) and individuals without health insurance in the USA
Circulatory death	Irreversible cessation of circulation and cardiac mechanical pump activity
Department of Health and Human Services	A government agency with oversight on the development and implementation of health care policy in the USA
Donation service area (DSA)	The administrative and operational joining of an organ procurement organization with its regional donor and transplant hospitals within the assigned geographic location
Joint Commission on Accreditation of Healthcare Organizations	A nongovernmental commission responsible for the safety and quality of care provided by health care organizations (for instance, hospitals) through the provision of health care accreditation and related services that support performance improvement
Institute of Medicine	A nonprofit private organization providing independent, objective, and evidence-based advice to policy makers, health professionals, the private sector, and the public on matters of biomedical science, medicine, and health
Neurologic death	Irreversible cessation of all neurologic, including brain stem, activity
Organ procurement organization (OPO)	A private, nonprofit organization operating under government contract to provide services covering all aspects of cadaveric organ donation, including donor selection, consenting, preparation, recovery and transportation of procured organs. Each organization is assigned to a specific geographic area with a total of 58 organizations covering the 52 states of the USA

support can also lead to cerebral and coronary resuscitation, and reanimation or return to life, which have to be suppressed by aortic balloon occlusion during procurement [8].

The DCD is applied to many individuals with intact neurologic and brain function before circulatory arrest, and therefore the presence of neurologic or brain activity during procurement is relevant [1,5]. There are no published reports of spontaneous neurologic or cardiac recovery or return to life during procurement in DCD. However, it may not be feasible to obtain that type of evidence if the procurement process itself is the final cause of irreversibility. Also, such reporting will probably create medicolegal concerns within the community. Under such circumstances, organ donation can no longer be considered to fulfill the dead donor rule. Legislative abandonment of the dead donor rule has been proposed for procurement of transplantable organs because of lack of sufficient scientific foundation for current DCD practice [11].

Consent for organ procurement

The OPO or affiliates are the designated ‘organ requesters’ in the organ donation consent process [5]. Hospitals are required to notify the OPO of all imminent deaths early and before withdrawal of ventilator support in order to initiate independently the discussion and consent process for organ donation with surrogates [3]. The conflict of interest and self-serving bias of the OPO can limit the exchange of information with surrogates and violate the standards for true informed consent. The objective of OPOs is to obtain consent for organ donation and meet the target donation rate within each

DSA [5]. The interlinking of OPO, donor, and transplant hospitals within a DSA can also heighten financial interests to maximize organ donation consent.

The donor’s authorization for donation on an organ donor card, driver’s license, or donor registry is legally binding and irrevocable, so in such cases the OPO can procure organs without family consent or after refusal [3]. Presumed consent has also been proposed to facilitate OPO recovery of transplantable organs [2]. In presumed consent, agreement for donation is the default choice, in the absence of express rejection by the potential donor. Therefore, in the absence of an individual’s express decision, their consent rather than refusal for organ donation is presumed. The legislative enactment of presumed consent enables the OPO to override donation refusal by surrogates. A conscription model has also been proposed so that consent for organ donation will neither be required nor requested by the OPO because of compulsory requirement for removal of all needed transplantable cadaveric organs [2].

End-of-life care

OPO staff officially assume planning of medical care of the donor after organ donation consent has been established, in order to maintain organs viability and prepare for their procurement [12]. Compliance with metrics for quality of end-of-life (EOL) care has been emphasized to deliver patient and family centered care and to ensure a ‘good death’ experience in the intensive care unit (ICU; Table 2) [13]. The quality of EOL care has not been measured nor reported for ICU donors enrolled in DCD programs [1]. DCD enrollment is

Table 2**Compliance of DCD with the quality indicators for EOL care in the donor**

Domains for EOL care	Quality indicators	DCD compliance
Patient and family-centered decision making	13	8
Communication within the team and with patients and families	10	4
Continuity of care	3	0
Emotional and practical support for patients and families	8	4
Symptom management and comfort care	10	1
Spiritual support for patients and families	3	1
Emotional and organizational support for ICU clinicians	6	1
Total	53	19

The 53 quality indicators within seven domains were developed by The Robert Wood Johnson Foundation Critical Care End-Of-Life Peer Workgroup [13]. The DCD is expected to comply with 19 out of 53 quality indicators for EOL care in the potential donor. DCD, donation after circulatory death; EOL, end-of-life; ICU, intensive care unit.

expected to deviate from more than 60% of the EOL care quality indicators (Table 2).

Ante mortem invasive instrumentation and testing that are nonbeneficial and perhaps harmful interventions that expedite death are often performed in preparation for DCD. The Wisconsin protocol is used to select suitable candidates for DCD [1]. The protocol is intended to predict whether circulatory arrest can occur within 60 min of withdrawal of life support. The high false-positive rate for selection of DCD candidates in the ICU can expose many dying ICU patients to unnecessary *ante mortem* interventions [14]. The quality of EOL care also has profound psychologic sequelae for families. Post-traumatic stress reaction has been reported in family members of ICU patients who share in EOL decisions [15]. Organ donation is a stressful and difficult EOL decision that can lead to anxiety, depression, and decreased quality of life among family members of the deceased donor.

Conclusion

The DCD criteria do not universally fulfill the dead donor rule. Therefore, legislative abandonment of the dead donor rule to permit the recovery of transplantable organs is necessary because of lack of adequate scientific foundation for DCD practice. The conflict of interest and self-serving bias of OPOs can interfere with a true informed consent for organ donation. Finally, mandatory compliance with EOL care metrics can ensure that donor care is not sacrificed for the recovery of transplantable organs.

Competing interests

The authors declare that they have no competing interests.

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