

FOCUS: RESEARCH AND CLINICAL ETHICS

Organ Donation After Acute Brain Death: Addressing Limitations of Time and Resources in the Emergency Department

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It is not unusual for emergency physicians to quickly identify whether a patient would have wanted to be resuscitated or intubated in a cardiac arrest situation, but patients' other preferences for end-of-life care or organ donation are less commonly ascertained in the emergency department. Typically, the decision process regarding such goals at end of life may be "deferred" to the intensive care unit. We present a case illustrative of the complexity of discussing organ donation in the emergency department and suggest that patients who die in the emergency department should be afforded the respect and consideration provided in other parts of the hospital, including facilitation of organ transplantation. As circulatory determination of death becomes a more common antecedent to organ transplantation, specific questions may arise in the emergency department setting. When in the emergency department, how should organ donation be addressed and by whom? Should temporary organ preservation be initiated in the setting of uncertainty regarding a patient's wishes? To better facilitate discussions about organ donation when they arise in emergency settings, we propose increased coordination between organ procurement organizations and emergency physicians to improve awareness of organ transplantation.

INTRODUCTION

Ask any emergency physician whether he or she has to make difficult decisions on the job, and you are likely to hear a vignette of a tough case from last shift. Ask about a

recent ethical dilemma, and there may be a pause. Rarely a shift passes without an ethical decision, yet providers may struggle to name their decisions as responses to ethical dilemmas. To an emergency physician (EP†), every piece of information feeds

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†Abbreviations: EP, emergency physician; OSH, outside hospital; ED, emergency department; OPO, organ procurement organization; CT, computed tomography; IV, intravenous; DNR/DNI, do not resuscitate/do not intubate; ICU, Intensive Care Unit.

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into diagnosis, treatment, or disposition. Although specific training in ethical issues is not a significant focus of their education, EPs solve ethical dilemmas on every shift, and some cases have the ethical dilemma as central to the outcome. We present an illustrative case where assessment of brain death, acknowledgement of patients' end-of-life wishes, and a discussion of organ donation occurred in the emergency department.

The case contrasts with a typical order of events surrounding organ donation. Usually, the organ donation process is initiated at the time of brain death determination. Definitions of and procedures to verify brain death vary between states, but many require examination by two independent physicians qualified to perform a determination. Some localities require an interval examination period between exams, though this practice is currently being reevaluated [1,2]. Typically, patients have been admitted to an intensive care unit (ICU) by the time the first exam is performed. By hospital or state regulation, the ICU team contacts the local organ procurement organization (OPO) at this time, so that a representative can both facilitate discussions with the family about organ donation and coordinate organ procurement. At the time of definitive brain death, the body is medically maintained to assure viability of transplanted organs until organs can be explanted in an operating room. In the ICU, the steps between a family's decision to withdraw life support and brain death determination usually span several hours, enabling all of an OPO's resources to be coordinated. A critically ill patient in the ED may be in the department for 30 minutes to 3 hours, at any time of the day. There may only be one or two physicians available at that time, each with numerous other ill patients.

The challenges of discussing organ donation in the emergency department (ED) rest in the rarity of such conversations, the limited availability EPs have to conduct proper discussions, and the principle of separation of the roles of physician/healer from organ procurement professional. Nonetheless, in some cases, timely decisions must be made about medical interventions to sustain

organs prior to transplant, which has the potential for conflict between medical care and organ procurement. By discussing the specifics of this case, we offer recommendations to expand EP education of and involvement with organ transplantation with the goal of better satisfying deceased patient's wishes and increasing collaboration between EPs and OPOs.

THE CASE

A 58-year-old retired nurse is transferred by ambulance from an outside hospital (OSH) for neurosurgical evaluation of a large subarachnoid hemorrhage. She is intubated and unresponsive, without medical sedation. The patient is accompanied by her daughter, her sister, her partner of 12 years, and a close family friend.

She presented to the ED of the OSH with a complaint of headache unlike any of her prior migraines that occurred while she was raking leaves. Initially, the headache was sharp, focused in the right posterior, and did not radiate. She had a brief change in her vision that she described as a "funny blurriness," which quickly resolved. The initial headache intensity was 4/10, but was manageable without analgesia. Because of the different nature of this headache, she presented to the ED for evaluation, where her mild symptoms led to a low severity triage level at 1900. The ED was busy with apparently higher severity patients, so a physician did not see her until 2200 when the patient suddenly screamed, became unresponsive, seized, and was subsequently intubated. Prior to administration of paralytics, her pupils were equal and fixed at 6 mm, and her extremities were in rigid extension. A CT scan showed a large right occipital subarachnoid hemorrhage with blood in the ventricles, posterior midline shift, and crowding of the brainstem suggestive of imminent herniation. No neurosurgeon was on call at the OSH, so the ED physician arranged for urgent transfer to the tertiary receiving hospital.

In transport, the patient seized once, which spontaneously resolved before paramedics could administer any medications.

She arrived at 2330, with blood pressure of 80/40 after having received 3 L of IV fluids. An initial neurologic exam by the EP and neurosurgeon was consistent with brain death. The dire prognosis was given to the family. Initially, only the family friend answered questions. The on-call social worker was paged, and after 10 minutes, she was able to meet with the patient's loved ones to continue a conversation about goals of care. The following social history was obtained:

Ms. X was a 58-year-old retired palliative care nurse who had no medical problems except migraines, which she managed symptomatically. She had just retired and was planning to travel in the next month to Europe with her partner of 12 years. Because of her vibrant health, she had no living will, but part of her job was to help patients at the end of their lives. The partner felt strongly that the patient would want to be designated DNR. Without being prompted, the patient's companions volunteered that they were not sure whether she would have wanted to donate her organs.

The topic of organ donation had been broached as part of the conversation with the family about the patient's wishes at the end of life. But at this point, the family's understanding of what the patient would have wanted remained unclear. In accordance with hospital policy, the EP notified the OPO of the potential donor so that they could respond promptly in person to talk with the family. After presenting the case, the OPO representative asked the physician to "slow things down" if the family decided to extubate. He was not in hospital and would arrange for the on-call OPO representative to come in to the hospital to speak with the family. The patient's blood pressure dropped to 70/30 by the end of the conversation with the organ bank. Since the topic of organ donation had been brought up previously, the EP informed the family that to be an organ donor, her mean arterial pressure would need

to be greater than 60 mmHg, and for that, she would need vasopressor support and possible central venous access.

THE DILEMMA

This patient had a grim prognosis. In light of a clinical exam consistent with brain death, resuscitative measures would have had no chance of changing this patient's outcome. The main dilemma for this case centered on the challenge emergency physicians face when discussing organ donation involving a recently deceased patient. The EP should be aware of other potential conflicts at the systems and individual levels that could arise in similar cases but are sufficiently addressed by other authors. These include 1) assigning an appropriate surrogate decision maker [3-5]; 2) the equivalence of extubation after determining DNR/DNI intent compared with not intubating at all [6]; and 3) the potential barriers to determining brain death in the emergency department [2]. The present dilemma of organ donation has three components:

1. In light of the family's uncertainty regarding the patient's wishes for organ donation, should the EP act against the patient's preference for no extraordinary measures in order to improve the chances of viable organ donation?

2. In light of the absence of an OPO representative, should the EP conduct the discussion regarding organ donation?

3. How should the EP address the external request to "slow down" decisions made by surrogates?

The first question seeks to identify the patient's core belief about organ donation. Given that she was a nurse who worked with individuals at the end of life, one could reasonably expect her to understand that if she were to donate organs, her body would need some external interventions. Nested in this situation is that her condition is so unstable that even the time needed for her surrogate decision makers to decide about donation may cause her organs to lose viability. If the patient *would* have wanted to donate, ag-

gressive measures (central IV access, vasoactive agents) would have been needed to facilitate this prior to the decision of whether to donate to happen; if she *would not* have wanted to donate, any action would have been a violation of her desires for no further intervention. One of the EP's goals, therefore, should be to balance the patient's known wishes (minimized interventions) with the uncertainty of her unknown wishes. At this point, it is conceivable that a nurse staunchly opposed to her own intubation and resuscitation would still want to be an organ donor.

The second question faces the difficulty of doing the right thing for the patient within the medical system. Independent of the need to procure organs as early as possible to ensure their biological viability [7,8], it is known that the chance of completing an organ donation depends on both the skill of the individual asking the family [9] and the time it takes to start the conversation [10]. The timeliness of this dilemma necessitated the clinical team's discussing these options with the family, especially since the family raised the topic. Generally, the discussion of organ donation is carried out separately from the primary care team [11] and is most often conducted by a specially trained OPO affiliated individual independent from the hospital. Given that the most skilled individual may not be able to be present in time to properly initiate the conversation, the EP needs to balance his or her own comfort discussing the topic with the abilities of the system arranged between the hospital and the OPO or find an acceptable middle ground until more resources are available.

The third question of whether to slow down the decision process until the OPO representative can arrive is related to the second, but has additional embedded components. This language can imply that the goal of organ procurement should supersede the goal of respecting the patient's wishes to not have invasive procedures, or it could represent the OPO's diligence to the principle of separating the roles of the physician and OPO personnel in this situation.

DISCUSSION

Should Temporary Organ Preservation Be Initiated?

Most organs donated in the United States are procured from patients after neurologic determination of death or "brain death" [12]. Since the brain death examination requires multiple steps and in many settings is done in the ICU by two different attending physicians separated by time, it is rare to have direct OPO facilitation in the ED. With the more recent development of donation after circulatory determination of death [13,14], it can be expected that a more active relationship between the ED and OPO will be required, and it will be more likely that EPs will be called upon to initiate treatments to perfuse organs in anticipation of transplant. Compared to brain death, circulatory death refers to the situation when a patient retains some minor brain stem function, yet it is clear that he or she cannot survive. Donation in such cases involves removing ventilator and vasopressor support; if the patient's heart stops beating in a set timeframe (usually 7 to 10 minutes), the physician declares the patient dead and organs can be removed for transplant. When it is clear that a patient is dead — by neurologic or circulatory criteria — and the patient is a clear organ donor, there are few ethical barriers to beginning treatments to preserve the donor organs. Such treatments may include chest compressions, vasoactive agent administration, and intubation with artificial respiration. Some jurisdictions have passed protections for the initiation of these treatments without consent until family can be contacted [15,16].

This patient had two peripheral IVs and was mechanically ventilated. She had been administered several liters of normal saline through the IVs, but her pressure had not responded, suggesting shock physiology. The invasiveness of any subsequent interventions must be considered before determining the necessity of consent for the procedures. Most DNR/DNI certificates specifically address the emergent interventions of intubation, chest compressions, defibrillation, and

vasoactive agents, suggesting that each of these should also be considered invasive enough to warrant permission from a family. Likewise, placement of central venous catheters typically requires written consent when not performed in an emergent situation and should receive the same treatment when a surrogate is the decision maker. Consent is typically not obtained for peripheral IV placement and fluid administration in the emergency department, but respect should be applied to the patient as though she were conscious of pain, especially without definitive brain death determination. With her progressive loss of circulatory support, this patient would need one of the more invasive procedures, namely a vasoactive agent through a peripheral IV or a central line.

This case falls into a category described as temporary organ preservation. Surveys of the public are mixed on whether it is acceptable to temporarily use invasive procedures to preserve organs while a decision is made about donation [17,18]. One view is that without temporary organ preservation, the opportunity to donate would be lost, and individuals who are later found to have wanted to become organ donors will not have had this wish upheld. The converse is that patients who are adamantly opposed to mechanical ventilator and circulatory support would be put through those procedures against their will. The patient in this case had been intubated because of an acute illness, but it became clear in the receiving ED that she had no realistic prognosis of recovery. The family was certain that she would not have wanted to be on a ventilator in such a situation, but was unsure whether she would have wanted to donate organs. Combined with the deteriorating vital signs requiring additional cardiovascular support, this patient needed temporary organ preservation to satisfy the requirements of donation.

With the legal next of kin present in the ED, we argue strongly for the ethical requirement to obtain consent for any additional procedure needed for organ preservation. Implied consent for temporary organ preservation is permissible in situations of sudden death when there is

documentation of intent to donate or in situations when family is not reachable.

The legal next of kin included one daughter who was present and two sons who were contacted by phone. Since the issue of organ donation had been raised by the family, the daughter was asked to decide whether her mother would have wanted to donate organs and for permission to give medications to keep her mean arterial blood pressure above 60 mmHg. The initial decision was to not place a central line, but during the ED stay, no consensus could be reached about donation or peripheral vasoactive pressors. IV fluid at 3 liters/hour maintained a systolic pressure of 80 mmHg.

Who Should Talk to the Family?

The organ procurement community is proactive in its outreach to hospitals [19]. At many large tertiary receiving hospitals, there is a staff member and office to help coordinate care for patients who are listed for receiving transplants, as well as for patients who are designated donors. Regions have variable wait times for listed patients; in areas with higher organ demand, effective communication between physicians and the OPO is even more critical when there is a potential donor. Many OPOs provide on-site counseling for families considering organ donation and representatives are on call 24 hours a day. Such a service provides individuals specially trained in this sensitive topic and also removes a conflict of interest between the provider and the physician who recovers the organs. It is easy to imagine inspiring confusion or suspicion in a family when the same doctor says “there is nothing we can do” and then “we need to put in a central line and give medications to make sure the organs don’t die.” Indeed, separating the notification of brain death from the discussion of organ donation has been found to be as much as eight-fold more likely to result in family consent to donation com-

pared with coupled requests [20,21]. Physical and temporal separation of death determination and procurement discussion is ideal, but as in this case, not always possible.

While the availability of organ donation personnel has been designed to be around the clock, there can be limited resources in the middle of the night. In an ideal setting, an emergency physician would have direct access to OPO resources and quick ethics consultation. In reality, constraints of time, information, personnel, and material resources conspire to force EPs to make difficult decisions that appear imperfect in hindsight. Ethics consults are typically not available in a timely fashion and, depending on a hospital's ethics committee structure, may not be possible. When faced with a moral or ethical dilemma, emergency physicians often rely on a moral compass or seek discussions with colleagues in the department or elsewhere in the hospital. Some physicians rightly rely on an internal normalization of "how would I respond if this were my mom" to identify empathy for the patient's family, though if the physician's thoughts were presented as recommendation, this could be characterized as paternalistic. A categorical listing of options for the family might suit a physician's goal of providing all the information needed for the surrogate to act fully on behalf of the patient, but this could lack the facilitated decision-making process often needed by families in this situation and previously shown to increase organ donation rates [22].

Even when intent to donate organs is indicated on the driver's license, permission to donate may not be granted by family [19]. Some authors suggest a "double veto" rule that account for both the deceased patient's intent and the family's wishes. In such situations, families would always be asked, no matter the indication on a driver's license. The ideal situation in cases of brain death with uncertain intent for organ donation would include a temporal and spatial separation between conversations related to the patients' determination of death and the initial conversation about organ transplantation. In the ED, this is not always — indeed

may rarely be — possible, given the constraints of time and physician resources. The EP may have neither the time nor the skills and comfort level to conduct a conversation about organ donation. Marshaling resources to help identify the family's options may require consulting social work, the chaplaincy, an on-call ethicist, as well as critical care and other medical specialists.

We believe that physicians may underestimate the emotional stability of a family faced with these end-of-life decisions. It is unfair to assume ignorance by suggesting that families can't understand that a physician can both do everything to resuscitate a patient and then shift gears into organ procurement considerations. The separation between the care team and the OPO team is usually possible in situations of brain death, so it could be argued the situation in this case is rare. With the possible increase in donations following circulatory determinations of death, there will be a greater emphasis on timely decisions and interventions to preserve organ viability. There will be a greater need for these discussions to occur completely in the ED, and without increased OPO representation around the clock, the role will fall to EPs to have these conversations with families. Public opinion about organ preservation activity is mixed, and studies are ongoing to better understand how to facilitate ED and out-of-hospital donation [23,24].

In cases where it is not possible for an OPO representative to conduct a conversation with family, it becomes incumbent on emergency physicians to have an objective conversation with family that clarifies his or her role as primarily the physician caring for the patient, but who can — if the family asks — also clarify details about the organ donation process. Many EPs do not have experience balancing those roles, as the majority of OPO activity occurs in the ICU setting. Alternatively, in the absence of an organ recovery team, a separate physician could be requested to facilitate the conversation about organ donation so that family perception of motives is not confused. This individual could be an appropriately trained physician

from anywhere in the hospital and could be from the ED, ICU, or a physician on-call for the hospital ethics committee.

We recommend that when possible, an OPO representative independent from the primary team speak with the family after the determination of death, but when the OPO is not available, it is permissible for another physician to speak with families about donation.

In this case, the EP conducted most of the brain death exam and obtained consultation from the neurosurgery and neurology services as well as on-call representative who was in another state, more than 2 hours from the hospital. The family had brought up organ donation, and there was an urgent need to clarify the deceased patient's intent before determining if temporary organ preservation was permissible. Without other physician designates available and because of the comfort the family had with the EP, the EP conducted the conversation with the family. No decision was made prior to transfer to the ICU.

Should We "Slow Things Down?"

When the OPO representative asked the emergency physician to "slow things down," the explicit goal was to delay conversation about donation while ensuring that the patient's organs remained viable for donation, should the family decide to donate. Given the known deterioration of her blood pressure, this would require continued aggressive medical management of blood pressure using fluid resuscitation and vasoactive agents and possibly additional venous access, including a central line.

From the EP's perspective, the OPO's request to "slow things down" in the face of the family's inquiry about organ donation had the potential to conflict with this patient's autonomy and with the ethical principle of non-maleficence. From the perspective of the OPO representative,

"slow things down" could have been shorthand for, "we prefer to be there in person, but are not able right now, so would appreciate your facilitating the patient remaining ventilated and perfused until the organ bank designee can arrive at the hospital." A separate outside perspective could interpret the language referring either to the OPO's primary goal of collecting viable organs at the expense of patients' wishes or to a distrust of the primary team's ability to discuss the issue with family. In subsequent conversations with the OPO involved with this case, the statement represented the OPO's diligence to the principle of separating the roles of the physician and the organ procurement team. It was at this point that the EP realized the complexity of the case was not simply confined to the proper disposition for the patient and that there was room for improvement of emergency physician understanding of organ donation and understanding by the OPO of the different pace of emergency care from an ICU environment. In retrospect, this case raises important concerns that should be addressed as we start to see more cases of organ donation following circulatory determination of death.

Patient requests for DNR and DNI are motivated by numerous perspectives, including individual perceptions of quality of life, concern for survivor family member grief, a wish not to contribute to unneeded resource utilization, and spiritual beliefs regarding these issues. A decision to donate organs may be motivated by pure altruism or personal experience with individuals suffering organ failure. These motivations need not be mutually exclusive and could easily be paired. In the case of organ donation, families can grieve simultaneously with a patient's continued mechanical ventilation and pressor support; it is common to face situations in which families facing sudden tragedy find comfort in their loved one's organs as gifts to other sick patients [25-27]. Likewise, as in this case, families prefer timely access to the information needed to inform their decisions.

In time-limited situations in which family members are available to interact

with the care team in the ED, we recommend that patient care and family decisions be placed ahead of the OPO's requests for decisional delays.

After being asked by the OPO to "slow things down," the patient's family wanted an update about her condition. When the family asked, "What are our options?" they were provided the following:

- Continue existing therapy with IV fluid and mechanical ventilation and arrange for ICU admission.
- Use vasoactive agents through a peripheral line to increase her blood pressure while deciding about her donation preference.
- Insert a central venous catheter to provide vasoactive support while you decide about her donation.
- Start the organ donation process in collaboration with the organ bank.
- Extubate the patient in the ED and provide her with opiate analgesia and anxiolysis.

Two hours after arrival in the tertiary ED, the patient was transferred to the ICU, without a decision regarding organ donation and without starting pressors. The OPO representative met the family in the ICU later that morning.

Signing Out

A further complication in these difficult cases in the ED is that physicians work shifts. That this patient rolled in 30 minutes prior to sign-out was a blessing for the family, as other clinical tasks related to three other critically ill patients could be passed on to the oncoming team, while the EP focused on the decisional support needed of this family. There are many situations in a busy ED with limited physician staffing when attention to a mourning family could conflict with other patients' critical needs.

While decisions of life and death are common in the emergency department, it is

rare that a decision to donate organs is deliberated prior to admission. More typically, a critically ill patient is stabilized and admitted to an ICU, where surgeons and intensivists offer medical opinions in end-of-life discussions and OPO representatives can be present to separate clinical and organ procurement activities. In retrospect, the EP's most important decision in this case was to remain available for the family as they deliberated, even though a final decision was not made until after ICU admission. There was no moral ambiguity in the decision to remain present to answer questions as the family made their decision, though the situation took an emotional toll on all involved, including consultants and ED staff.

CONCLUSIONS AND RECOMMENDATIONS

The difficulties faced in this case highlight the unique context the ED offers in organ donation conversations. As donation following cardiac death becomes more common, there will be more uncertainty among EPs about whether and how to provide temporary organ preservation and how to obtain consent for these activities. When cases occur during off hours or if a representative from an OPO is not available, EPs may need to speak with families about their loved one's organ donation, either themselves or as a second provider separate from the primary team.

The unique setting of the emergency department provides challenges to the typical approach to organ donation as it plays out in the ICU. To address these differences, we recommend:

1. EPs initiate temporary organ preservation in situations where there is clear intent of the deceased to donate organs or when families volunteer their loved one would want to donate.

2. EPs use all available resources, preferably OPO representatives to interact with patients' families when discussing organ donation, but a second physician from the ED or the ICU could serve as a third

party consultant to separate medical treatment from organ donation.

3. If the topic of organ donation arises in the ED, EPs should be prepared to make decisions that honor the deceased's wishes, especially if OPO representative arrival is delayed.

To facilitate effective communication with deceased patients' families, we propose continued education of emergency physicians on the following topics:

1. Medical determination of brain death. This is not a difficult exam and is appropriate for the primary caregiver in the ED to perform.

2. Understanding the importance of decoupling determination of death from organ procurement efforts.

3. Early and frequent communication between the emergency department and the OPO about when a representative will be on hand to assure decoupled decisions.

4. Clarification of organ preservation as an ethically acceptable activity, as long as consent is achieved after the decision to donate organs.

Future effort should be directed at clarifying and overcoming barriers to a complete brain death examination in the emergency department, developing a resident teaching and continuing education module to assist EPs with mastering these topics, and continuing collaboration between OPOs and EDs on protocols related to organ donation.

CASE RESOLUTION

After further conversation with the family, the daughter and partner were not able to decide about the patient's intent to donate organs. IV fluids were continued, but no central line was placed and vasoactive pressers were not started. She remained hypotensive. The patient was admitted to neurosciences ICU for further management and consultation about goals of care. After conversation with her brothers, the family decision by 0700 was that the patient's strong wish to be DNR/DNI superseded any additional medical interventions. This was fur-

ther supported that considering her significant work experience with end of life decision-making, if she had wanted to be an organ donor she would have designated such on her driver's license or at least would have mentioned it to her loved ones. This decision occurred at the same time the OPO representative arrived at the hospital to approach the family about donation. Six hours after admission, 8 hours after transfer, and 14 hours after the initial headache, she was extubated and died with her family and loved ones at her side. She did not donate organs.

REFERENCES

1. Lustbader D, O'Hara D, Wijdicks EFM, MacLean L, Tajik W, Ying A, et al. Second brain death examination may negatively affect organ donation. *Neurology*. 2011;76(2):119-24.
2. Varelas PN, Rehman M, Abdelhak T, Patel A, Rai V, Barber A, et al. Single brain death examination is equivalent to dual brain death examinations. *Neurocrit Care*. 2011;15(3):547-53.
3. Shalowitz DI, Garrett-Mayer E, Wendler D. The accuracy of surrogate decision makers: a systematic review. *Arch Intern Med*. 2006;166(5):493-7.
4. Song M-K, Ward SE. Disconnect between emergency contacts and surrogate decision-makers in the absence of advance directives. *Palliat Med*. 2013. Epub ahead of print.
5. Sullivan DR, Liu X, Corwin DS, Verceles AC, McCurdy MT, Pate DA, et al. Learned helplessness among families and surrogate decision-makers of patients admitted to medical, surgical, and trauma ICUs. *Chest*. 2012;142(6):1440-6.
6. Beauchamp TL, Childress JF. *Principles of Biomedical Ethics*. 6th ed. New York: Oxford University Press; 2009.
7. Rosengard BR, Feng S, Alfrey EJ, Zaroff JG, Emond JC, Henry ML, et al. Report of the Crystal City meeting to maximize the use of organs recovered from the cadaver donor. *Am J Transplant*. 2002;2(8):701-11.
8. Westphal GA, Caldeira Filho M, Fiorelli A, Vieira KD, Zaclikevis V, Bartz M, et al. Guidelines for maintenance of adult patients with brain death and potential for multiple organ donations: the Task Force of the Brazilian Association of Intensive Medicine the Brazilian Association of Organs Transplantation, and the Transplantation Center of Santa Catarina. *Transplant Proc*. 2012;44(8):2260-7.
9. Youngner SJ, Arnold RM. Ethical, psychosocial, and public policy implications of procuring organs from non-heart-beating cadaver donors. *JAMA*. 1993;269(21):2769-74.

10. Michael GE, O'Connor RE. The importance of emergency medicine in organ donation: successful donation is more likely when potential donors are referred from the emergency department. *Acad Emerg Med.* 2009;16(9):850-8.
11. Luskin RS, Glazier AK, Delmonico FL. Organ donation and dual advocacy. *N Engl J Med.* 2008;358(12):1297-8.
12. Organ Procurement and Transplantation Network [Internet]. 2013 [cited 2013 June 30]. Available from: <http://optn.transplant.hrsa.gov/>.
13. Domínguez-Gil B, Haase-Kromwijk B, Van Leiden H, Neuberger J, Coene L, Morel P, et al. Current situation of donation after circulatory death in European countries. *Transpl Int.* 2011;24(7):676-86.
14. Hassan TB, Joshi M, Quinton DN, Elwell R, Baines J, Bell PR. Role of the accident and emergency department in the non-heart-beating donor programme in Leicester. *J Accid Emerg Med.* 1996;13(5):321-4.
15. Bonnie RJ, Wright S, Dineen KK. Legal authority to preserve organs in cases of uncontrolled cardiac death: preserving family choice. *J Law Med Ethics.* 2008;36(4):741-51, 610.
16. Wood KE, Becker BN, McCartney JG, D'Alessandro AM, Coursin DB. Care of the potential organ donor. *N Engl J Med.* 2004;351(26):2730-9.
17. DuBois JM, Waterman AD, Iltis A, Anderson J. Is rapid organ recovery a good idea? An exploratory study of the public's knowledge and attitudes. *Am J Transplant.* 2009;9(10):2392-9.
18. Volk ML, Warren GJW, Anspach RR, Couper MP, Merion RM, Ubel PA. Attitudes of the American public toward organ donation after uncontrolled (sudden) cardiac death. *Am J Transplant.* 2010;10(3):675-80.
19. Childress JF, Liverman CT. Organ Donation: Opportunities for Action. Institute of Medicine. Washington, DC: National Academies Press; 2006.
20. DeJong W, Franz HG, Wolfe SM, Nathan H, Payne D, Reitsma W, et al. Requesting organ donation: an interview study of donor and nondonor families. *Am J Crit Care.* 1998;7(1):13-23.
21. Franz HG, DeJong W, Wolfe SM, Nathan H, Payne D, Reitsma W, et al. Explaining brain death: a critical feature of the donation process. *J Transpl Coord.* 1997;7(1):14-21.
22. Gortmaker SL, Beasley CL, Sheehy E, Lucas BA, Brigham LE, Grenvik A, et al. Improving the request process to increase family consent for organ donation. *J Transpl Coord.* 1998;8(4):210-7.
23. Light JA. The Washington, D.C. experience with uncontrolled donation after circulatory determination of death: promises and pitfalls. *J Law Med Ethics.* 2008;36(4):735-40, 610.
24. Wall SP, Dubler NN, Goldfrank LR, New York City Uncontrolled Donation after Cardiac Death Study Group. Translating the IOM's "boldest recommendation" into accepted practice. *J Clin Ethics.* 2009;20(1):23-6; author reply 41-3.
25. Corr CA, Coolican MB. Understanding bereavement, grief, and mourning: implications for donation and transplant professionals. *Prog Transplant.* 2010;20(2):169-77.
26. Walker W, Broderick A, Sque M. Factors Influencing Bereaved Families' Decisions About Organ Donation: An Integrative Literature Review. *West J Nurs Res.* 2013.
27. de Groot J, Vernooij-Dassen M, Hoedemaekers C, Hoitsma A, Smeets W, van Leeuwen E. Decision making by relatives about brain death organ donation: an integrative review. *Transplantation.* 2012;93(12):1196-211.