

From [Medscape Transplantation](#)

The Growing Use of Donation After Cardiac Death Donors: An Expert Interview
With Howard M. Nathan
Posted 08/29/2005

***Editor's Note:** The shortage of cadaveric organs for transplantation has led to the increased use of expanded-criteria donors and live donors. Among the other alternatives, the use of organs from donors who die from traditional cardiac death, ie, donation-after-cardiac-death (DCD) donors, is increasing as well. Once a mainstay source of organs in the pioneering days of transplantation, use of the DCD donors was considered passé upon the legal and ethical acceptance of brain death. Although most organ procurement organizations (OPOs) and transplant centers have abandoned their use, some have remained committed to using DCD donors in an attempt to increase the donor pool. Their efforts have become more widespread and DCD donors are, once again, a recognized and legitimate source of donor organs. Gwen Mayes, JD, MMSc, author of the Medscape Transplantation Expert Column Series "[Current Policy Issues: Shaping the Future of Transplantation in the United States](#)" interviewed Howard M. Nathan, President and CEO, Gift of Life Donor Program, Philadelphia, Pennsylvania, about the use of DCD donors and the ways in which this practice can be increased.*

Medscape: What is a DCD donor?

Mr. Nathan: There are essentially 2 categories of DCD donors. Controlled DCD donors are patients whose family has decided to withdraw care because of an irreversible and devastating neurologic injury. In this case, once the patient's family and the attending physician have decided that life support will be discontinued, the option of DCD may be considered. However, in the case of the uncontrolled DCD, the patient either had a sudden cardiac arrest or was recently diagnosed with brain death and the heart stopped unexpectedly. Either way, the situation with an uncontrolled DCD donor is much more urgent, and if the family wishes to donate, it is possible, but the procurement moves much more quickly.

Medscape: Are you saying that DCD donors are not brain dead?

Mr. Nathan: Correct, DCD donors are never brain dead, or at least they are not determined to be dead on the basis of neurologic criteria. Although brain death has been recognized for many years and most of our traditional organ donors are brain dead, in the case of DCD donors, death results from cessation of cardiopulmonary function. Once the ventilator has been discontinued and cardiac arrest occurs, the patient is observed for any evidence of auto-resuscitation before death is pronounced. Generally, this is for a period of 5 minutes or less.

Medscape: Do DCD donors generally present in the emergency department?

Mr. Nathan: Not generally. Most of our referrals come from the intensive care

unit when a patient is near death and the family has decided to withdraw care. Dr. David Hume performed the first recorded DCD donor procurement in 1951 when he was caring for a post-partum patient in acute renal failure and another patient near death in the emergency room. He removed the dying patient's kidney after death and transplanted it in the woman's brachial artery. It was the first transplant recorded of its kind and it worked for a couple of days. Today, most DCD donors are patients who have been admitted to a hospital for treatment and for whom death is imminent. Actually, we see it as a family-driven process. We are providing an opportunity for the family to donate when there wasn't one before. Care is withdrawn every day in almost every hospital in this country. What we are advocating, for the most part, follows the hospital's protocol for withdrawal of care or life support.

Medscape: Which OPOs currently procure DCD donors?

Mr. Nathan: Currently, about 15 OPOs in the United States perform 80% of the DCD donor procurement. Last year, Gift of Life in Philadelphia performed the highest number of DCD donor procurement (47), followed by the New England Organ Bank in Boston, Massachusetts, and Gift of Hope Organ and Tissue Donor Network in Chicago, Illinois. But the numbers are up across the board. In 1995, there were 5358 deceased donors, of which 64 were DCD donors, and at least 22 OPOs performed at least 1 DCD donor procurement. In 2004, the total number of deceased donors increased to 7156 and the number of DCD donor procurements increased to 389, with 41 of 58 federally designated OPOs performing at least 1 DCD donor procurement.

Medscape: Do you expect continued growth in 2005?

Mr. Nathan: Yes, for sure. Through June 30 this year there have been 3759 deceased donors, of which 273 were DCD donors. That's a 7.3% increase.

Medscape: What are the survival rates with DCD donors?

Mr. Nathan: The important thing is that the organs work well, particularly the kidneys. Studies have shown that patient and graft survival rates are not statistically different from rates in traditional brain death donors; if anything, they are better. The Gift of Life Donor Program published a series of findings on our DCD donors since 1995 at the Transplantation Society meeting in Vienna, Austria last year. For DCD donor procurements from 1995 through 2004, the 1-year patient survival rate was 96.2% compared with the 1-year patient survival rate of 93.2% in heart-beating donors. We also demonstrated better long-term results. The 5-year graft survival rate for DCD donors was 78.5% compared with 62.3% in heart-beating donors .

Medscape: Are the medical and age criteria the same for DCD donors as for heart-beating donors?

Mr. Nathan: The criteria for DCD donors are even more conservative in terms of suitability. In the case of a heart-beating donor who is in his/her 70s with hypertension and diabetes, we might use the liver and even the kidneys. But we would not use these organs in the case of a DCD donor because that increases the warm ischemia time and creates potential perfusion problems before the organs

are removed in an already compromised, older donor. The warm ischemia time after the demise of the patient contributes additional damage to the organs and, thus, we take a more conservative approach to determine suitability of a DCD donor.

Medscape: You mentioned hospital protocols for withdrawing care. How does DCD donation and procurement fall into that protocol?

Mr. Nathan: As I mentioned, hospitals already have protocols in place for withdrawal of life support that are used every day in this country. DCD donation potentially deviates from these protocols in 3 ways. First, the patient is moved to the operating room before the ventilator is disconnected. The family, if they wish, can gown up and be present in the operating room when death is declared. Second, the patient is given heparin prior to extubation so it can circulate and aid in the removal of the organs. And finally, the surgical procurement team is preparing in the adjacent operating room and ready to proceed once death has been declared. At least in a controlled situation, this is how it happens; it is very well orchestrated. However, in an uncontrolled situation, we have to forgo some of this and move right along as quickly as the procurement team can arrive and get started.

Medscape: The process seems to happen quickly. How long do you wait between asystole and pronouncement of death before beginning procurement?

Mr. Nathan: We wait 5 minutes, which is the standard used by most OPOs. Of all the OPOs surveyed, over 90% wait 5 minutes, but a few wait a shorter period of time, and 3 wait for only 2 minutes. None wait less than 2 minutes. In 2001, the Society of Critical Care Medicine concluded that 2 minutes of observation is required and more than 5 is not recommended. It's a delicate balance. Plus, it requires us to rethink our notion of warm ischemia time. We have to be able to report warm ischemia time to the transplant center, and it can vary depending upon the time a program waits to get started once the pronouncement of death has been made.

Medscape: Are there critics of DCD donation?

Mr. Nathan: Any concerns that have been voiced have generally centered on how the patient is declared dead. Usually, this is due to lack of understanding about the process vs staunch criticism. Giving a medication (heparin) before extubation and pronouncement of death concerned Catholic hospitals in the beginning. However, there is no evidence that this contributes to the dying process or in any way hastens death.

Medscape: What is being done to increase the use of DCD donors?

Mr. Nathan: There was a consensus conference in Philadelphia last April attended by 6 workgroups to address various aspects ranging from the declaration of death to how to fairly allocate organs from DCD donors. Part of the conference was devoted to airing concerns by OPOs and hospitals that aren't currently

involved in DCD donation to identify ways to mentor them or clear the way for them to get involved. One recommendation involved recipient consent. We want to make sure that recipients are told up front that they are being offered an organ from a DCD donor and that they are given the option to decline. We also think this should be recorded when they are listed on the national transplant waiting list, and re-discussed at the actual time of transplant. A report from that conference is forthcoming.

The practice just continues to increase. More and more OPOs are adopting the procedure. The key is good hospital development within the OPO service areas so that there is an understanding by physicians and hospital personnel that this is just providing another option for families. It really is simply part of the continuum of end-of-life care. That's what it is about.

Related Links

Clinical Articles

[Medicare Proposes Comprehensive Regulations for Transplant Centers](#)

[CMS Proposes Rule for Organ Procurement Organizations Aimed At Increasing Organ Donation and Improving Performance](#)

Howard Nathan, President and CEO, Gift of Life Donor Program, Philadelphia, Pennsylvania

Disclosure: Susan L. Smith, MN, PhD, has disclosed no relevant financial relationships.

Disclosure: Howard Nathan has disclosed no relevant financial relationships.

Medscape Transplantation. 2005;6(2) ©2005 Medscape