

The Ethics of Heparin Administration to the Potential Non-Heart-Beating Organ Donor

ELIZABETH D. MOTTA, BSRN*

The increasing need and limited sources for organs has stimulated a renewed interest in non-heart-beating organ donation (NHBD). NHBD is the donation of organs from cadavers that have been declared dead by cardiopulmonary criteria. Emerging protocols for heparin administration to the potential non-heart-beating organ donor (NHBD) deserve scrutiny. This topic is presented within a limited discussion of organ donation in general. The definition of death has been refined to its present state because of the need for clear parameters in light of a desire to procure organs for transplant. The administration of heparin to the NHBD is intended to prevent the formation of blood clots in the kidneys and liver. Heparin at high doses is clearly not given for the benefit of the patient, and some professionals are concerned that administration may hasten death. Nurses are guided by codes that require the consideration of the ethical principles of autonomy, informed consent, beneficence, and justice while providing compassionate care. An eagerness to procure viable organs for positive transplant outcomes must not be the guiding force in protocols that allow the administration of heparin to the potential NHBD. Heparin administration is supported for these donors within specific parameters. (Index words: Ethics; Organ donation; Heparin administration; Non-heart-beating) *J Prof Nurs* 21:97–102, 2005. © 2005 Published by Elsevier Inc.

IT IS EASY to assume that decisions surrounding procedures for organ donation and transplantation are made by interdisciplinary teams of well-informed and well-intentioned participants, and although this may be true, the public must be included in discussions regarding end-of-life decisions, organ donation, and organ transplantation.

*Department of Nursing, Rhode Island College, Providence, RI.

Address correspondence and reprint requests to Ms. Motta: Rhode Island College Department of Nursing, 600 Mount Pleasant Avenue, Providence, RI 02908.

8755-7223/\$30.00-see front matter

© 2005 Published by Elsevier Inc.

doi:10.1016/j.profnurs.2005.01.005

The option of organ donation is well advertised to the American public; however, few people have been exposed to the specifics of the donation process. One aspect of organ donation that deserves public scrutiny is heparin administration to the potential non-heart-beating organ donor (NHBD).

This article will examine the ethical considerations for the administration of heparin to the potential NHBD and support heparin administration to these donors within specific parameters. The topic is presented with a limited discussion of organ donation in general and some specifics of non-heart-beating organ donation (NHBD).

Organ Donation

The people surrounding organ donation and transplantation are the organ donor, the organ donor's family, the organ donor's care providers (nurses, doctors, social workers, etc.), the organ procurement organization (OPO), the organ procurement team (technicians, surgeons, nurses), the transplant recipient, and his or her care providers and family. Each person involved approaches the circumstances of donation or transplantation with a different purpose and perspective. Although this article does not investigate the impact that the issue of heparin administration to the potential NHBD may have on transplant recipients, discussions of organ donation are never independent of concerns for organ transplant recipients. There is a natural progression of considering outcomes for organ recipients when investigating transplant modalities.

Discussions of organ donation and transplantation generally include tissues and solid organs, but exclude blood, blood components, and bone marrow. Transplantable tissues are corneas, heart valves, bone, skin, and other connective tissues. Transplantable organs are the heart, the lungs, the liver, the kidneys, the pancreas, and the intestines.

Organ donation can be organized into three major categories: donation of organs from living donors (as in

the case of a relative donating a kidney), donation of organs from cadavers that have been declared dead by brain death criteria, and donation of organs from cadavers that have been declared dead by cardiopulmonary criteria.

The donation of organs from cadavers that have been declared dead by cardiopulmonary criteria is called non-heart-beating organ donation. Alternatively, there is a new trend to call it *donation after cardiac death*. The potential NHBD may be a person who has suffered an injury to the brain, but who does not meet the strict criteria of brain death. It may be someone who has been involved in a motor vehicle accident, homicide, or suicide, or someone who has suffered a brain injury from cardiac arrest, drug overdose, or stroke. The injuries are deemed to be unrecoverable by the person's attending physician and the family of the person has decided to withdraw life support. For this person and his or her family, NHBOD may be an option.

NON-HEART-BEATING ORGAN DONATION

Currently, kidneys and the liver are the only organs that are routinely procured from NHBD's because they have been found to result in successful transplant outcomes. The heart, lungs, pancreas, and intestines are damaged during cardiopulmonary death, and their transplantation has not been widely successful.

There are two classifications of NHBOD, controlled and uncontrolled, and they differ in the timing and circumstances surrounding the donation. Controlled NHBODs are planned, with enough time for the family to consider choices and consent to the donation. Uncontrolled NHBODs are performed emergently, after resuscitation efforts have failed (e.g., in an emergency department). Often, in uncontrolled NHBOD, there is insufficient time to obtain family consent before it is necessary to begin organ procurement and therefore preserve organ viability. In some countries, consent for organ donation is presumed and it is not necessary to obtain specific consent from the family. Traditionally, facilities in the United States do not presume consent for organ donation, and because consent cannot usually be obtained quickly, uncontrolled NHBOD in the United States is uncommon.

ORGAN PROCUREMENT ORGANIZATIONS

Organ Procurement Organizations (OPOs) are agencies that ensure the separation of organ donors from organ recipients and the prevention of conflict of interest between donor teams and recipient teams. (For example, it would be a conflict of interest if the doctor

for a potential transplant recipient made decisions regarding a potential organ donor's end-of-life care.) OPOs also counsel and support the organ donor's family, communicate with transplant teams across the world, arrange for procurement, storage, transport, and distribution of tissues and organs, and inform participants in the process of transplant outcomes. OPOs work with individual procurement and transplant facilities, in regional areas, to facilitate organ donation and transplantation.

United Network of Organ Sharing (UNOS) is the national scientific and educational organization that oversees the distribution of organs in the United States. Each regional OPO in the United States is a member of UNOS, which collects and manages data for every transplant in the United States.

The policies and protocols of individual procurement facilities, along with federal and state legislation, guide the practices of organ donation and transplantation. These practices include an agreement that cadaveric organ procurements can only occur after the declaration of death of a donor and that the decision to allow organ donation can only be made after the decision to end life support. Typically, OPOs proceed with organ donation discussions only if the families of potential donors are considering donation, and they discontinue discussions of donation if any family member objects.

ORGAN SOURCES

The increasing need and limited sources for transplantable kidneys and livers have stimulated a renewed interest in NHBOD. Interestingly, this is not a new modality, but rather a return to the original source of transplantable organs. Although considered controversial by some, this source of transplantable organs has been carefully evaluated by the Institute of Medicine (IOM), at the behest of the Department of Health and Human Services, and recommendations for standard practices are currently being proposed and adopted nationally (Herdman & Potts, 1997).

Definition of Death

Before 1968, all cadaveric organ donations were from NHBDs that had been declared dead by cardiopulmonary criteria. The acceptance of brain death criteria came after a 1968 publication by the Ad Hoc Committee of the Harvard Medical School in the *Journal of the American Medical Association*. This document recommended that the patient be declared

dead when brain function was shown to have ceased. Notably, the committee dealt with this issue partly in response to the controversy over the standards followed in obtaining organs for transplant (Miller, 1971). The definition of death has been refined to its present state because of the need for clear parameters in light of a desire to procure organs for transplant.

BRAIN DEATH

The concept of brain death is commonly accepted today, but it was not popularly accepted until the 1970s (Orloff et al., 1994; Ethics Committee, American College of Critical Care Medicine, Society of Critical Care Medicine, 2001). In brain death, the whole brain, having been deprived of oxygen, ceases to function and can no longer support the body. A body may be kept functioning with the help of mechanical ventilation (support that breathes for the body), but will not do so indefinitely (Delmonico, 2003). The actual declaration of death occurs when brain death has been determined, not when the body ceases functioning.

CARDIOPULMONARY DEATH

In cardiopulmonary death, or the cessation of circulation from the heart and respiration by the lungs, death also results in brain death. Dr. William H. Sweet (1981), commenting on brain death noted, "It is clear that a person is not dead unless his brain is dead. The time honored criteria of stoppage of the heartbeat and circulation are indicative of death only when they persist long enough for the brain to die."

There has been recent debate about when in fact brain death occurs after cardiopulmonary death. This issue is addressed in the 1997 IOM report and current practices include intervals from 2 to 10 minutes depending on the facility and individual practitioner. Undoubtedly, the discussion will continue.

Heparin

As with all pharmacological agents, the administration of heparin carries certain risks. Heparin is a commonly prescribed drug used for the prevention of the formation of blood clots. This is known as anticoagulant therapy. Heparin is often referred to as a blood thinner. It is administered either intravenously or subcutaneously and is most frequently used in hospital settings. It prevents blood clots from forming or growing but cannot reduce the size of an existing blood clot. Heparin that is administered

intravenously acts immediately, with peak action in 5–10 minutes. The effects of heparin last for 2–6 hours and can be reversed by the administration of protamine sulfate (Deglin & Vallerand, 2003). Heparin is given in large doses to patients undergoing heart or blood vessel surgery. Each type of surgery has specific requirements, and doses of 300–400 units of heparin per kilogram of body weight are common in cardiac surgery (Sifton, 2003). Thus, a patient weighing 220 lb, or 100 kg, could receive 30,000–40,000 units heparin during a surgery requiring cardiopulmonary bypass (F. Rotenberg, personal communication, April 26, 2003).

All cadaveric organ donors receive heparin before organ procurement. The timing of the heparin administration presents the ethical dilemma. In the case of a brain death donor, the administration of heparin occurs after the declaration of death. In the case of a NHBD, for the heparin to circulate through the body, it must be administered before the declaration of death.

The medical management of potential NHBDs is designed to maximize the success of kidney and liver transplants, and heparin administration is part of that management. The administration of heparin to the NHBD is primarily intended to prevent the formation of blood clots in the kidneys and liver. Blood clot formation in an organ would reduce the chances for successful or even possible transplantation. Organs with blood clots are considered not viable, that is, they are not useful for transplant. Without heparin administration to the potential NHBD before the declaration of death, the liver is not transplantable and the kidneys may develop blood clots, reducing transplantation success.

Importantly, giving heparin to the potential NHBD after the declaration of death may not permit the heparin to circulate throughout the body, and therefore may not prevent blood clots.

Although there is no universal agreement for the dosage of heparin needed for anticoagulation effect in the potential NHBD, currently, 30,000–40,000 units heparin have been administered to cadaveric donors declared dead by brain death criteria before organ procurement, with good kidney and liver transplant results. Given these successes, similar doses have been proposed and adopted within individual institution protocols (P. Morrissey, personal communication, April 19, 2003).

Heparin at these high doses is clearly not given for the benefit of the patient, and concern exists that the potential adverse reaction of hemorrhage is a

contraindication for use. Opponents to heparin administration before the declaration of death assert that heparin may cause bleeding, thus hastening the death of the potential donor. They believe that this risk makes heparin administration to the potential NHBD ethically unacceptable. Heparin administration to the potential NHBD is ethically acceptable under the following conditions:

1. The administration is not intended or likely to cause death;
2. Active bleeding is not known to exist;
3. The dosage of heparin is based on the patient's weight;
4. The risk to the patient is deemed negligible or minimal by the patient's attending physician;
5. The decision to allow the administration of heparin before the declaration of death is made by the family of the patient with the counsel of the patient's attending physician.

Ethics

When examining ethical issues, it is important to recognize that both the medical and nursing communities rely on codes of behavior that dictate how a person should act. For nurses, these include the American Nurses Association Code of Ethics for Nurses, which guides nurses to provide service with respect for human dignity and worth and to preserve, protect, and support the rights of all people. The provisions of the code direct nurses to promote, advocate, and protect the health, safety, and rights of patients while maintaining privacy and confidentiality. Additionally, it requires that nurses protect patients from unethical, incompetent, or illegal practices, to be responsible and accountable for judgments and actions, to protect the public from misinformation or misrepresentations, and to work collaboratively and respectfully to meet the needs of the public (American Nurses Association, 2003).

Historically, physicians are guided by a Hippocratic tradition that compels them "to do the best you can for your patient, or to act for the good of the sick" (Kopelman, 1985). Today, the specific ethical principles associated with this tradition continue to be debated among international groups of physicians. (Some physicians have never taken an oath as part of their training.) Regardless of the absence of clearly defined ethical principles, physicians remain committed to patients and their well-being (Gersten, 2004).

Additionally, both nurses and doctors strive to provide compassionate care. Simply stated, compassion is a feeling of deep sympathy with a strong desire to help alleviate suffering. This virtue, although certainly not exclusive to medical professionals, often becomes magnified for nurses and doctors during end-of-life events.

Initially nurses and doctors care for patients with recovery as their goal. When they recognize that recovery or even survival is not possible, their focus shifts from preventing death to helping families understand end-of-life options. Compassion drives both efforts.

The ethical principles of autonomy, informed consent, beneficence, and justice are applied here, within the context of these codes and alongside the virtue of compassion to judge the issue of heparin administration to the potential non-heart-beating organ donor (NHBD). This traditional ethical approach considers rights and consequences with a focus on the individual.

Autonomy

Autonomy, or a person's right to act independently and make personal choices, allows the administration of heparin to the potential NHBD. Whether the choice is made by the donor, for example, by indicating his or her wishes in a document, or by proxy, with the decision by the next of kin, choosing to allow the administration of heparin is an example of free choice. Understandably, because heparin administration to the potential NHBD is a relatively new modality, it is unlikely that an individual, who has expressed his or her willingness to become an organ donor, has addressed this issue specifically.

People donate organs because they have a desire to help others and because they are looking for a way to have something positive emerge from the death of a loved one (Reich, 1995). In fact, some individuals or families feel strongly about being allowed to donate organs after death, with the goal of successful transplantation outcomes. For them, heparin administration allows the best opportunity for a recipient's positive outcome, without changing the outcome for their loved one. Their need to help others and the possibility that there could be a positive aspect to their tragedy outweigh the concern of potential risk. The death of their loved one is imminent, and the prospect of helping others may, in fact, help ease their pain (Reich, 1995). For them, the decision to donate their loved one's organs is an autonomous choice, and the administration of heparin allows that choice to

have meaning because organs can be transplanted only if they are viable.

Autonomous choices are made within the context of an individual's social and moral perspective, with restrictions based on societal norms. For example, in the United States, the freedom to make personal choices about cancer treatment is widely respected, but allowing the option of physician assisted suicide is not. In this culture, great emphasis is placed on an individual's right to self-govern. Notably, however, the United States continues to be a melting pot of diverse cultures, religions, and moral attitudes, and perspective must be considered when examining the issue of autonomy for an individual or family. The right of autonomy requires that foreign moral attitudes are not imposed on potential donors and their families. In fact, during a period of great stress, the medical and nursing communities must be particularly sensitive and diligent in their respect for diverse viewpoints.

It is important that all risks associated with heparin administration to the potential NHBD be disclosed and understood. This ethical principle, known as informed consent, evolves from the principle of autonomy and requires that any decision to allow heparin administration to the potential NHBD be made with full disclosure. Informed consent has legal implications, which has three considerations; first, the decision maker must be competent to give consent; second, consent must be given freely; and third, consent must be based on an adequate understanding of outcomes and options (DeSpelder & Strickland, 2002). Each of these considerations must be part of the decision to allow heparin administration to the potential NHBD.

INFORMED CONSENT

In the United States, organ donation requires informed consent from the donor and/or the donor's proxy, but OPOs traditionally allow organ donation only if families have unanimous agreement that organ donation is right for the patient and the family. The same standard should apply to the administration of heparin to the potential NHBD. Because heparin administration is a relatively new modality, and one that the public is not commonly aware of, attention must be paid to explain the medical and ethical issues surrounding its use. In addition, because heparin administration to the NHBD is a new practice, informed consent is a critical issue. Just as organ transplantation itself has moved from being experimental medicine to accepted practice, new modalities

such as the administration of heparin to the potential NHBD must be clearly understood and consented to before it can be accepted as routine.

BENEFICENCE

If beneficence, or doing good, is the most positive thing that can be done for a patient, then maleficence, or doing bad, may be the most negative thing that can be done for a patient. The risks of administering a large dose of heparin, which has the potential to cause harm and is clearly not intended to benefit the patient, must be evaluated on a case-to-case basis. The patient's attending physician must determine if the risk is negligible, minimal, possible, or probable and sanction administration only when the risk of an adverse outcome to the patient is deemed negligible or minimal. The need to "do good" for society by providing transplantable organs cannot guide end-of-life decisions for potential NHBD. Just as the decision to donate organs must be made after the decision to end life support, allowing the administration of a large dose of heparin must be made after the assessment of negligible or minimal risk.

Opponents to the administration of heparin to the potential NHBD believe that bleeding, which could occur after the administration of heparin, has the potential to hasten death, and therefore, there is never a case where the risk of heparin administration should be allowed. To them, the action of administering heparin to the potential NHBD is maleficence, because it may hasten death. Notably, we administer other medications that hasten death, such as morphine, and we hasten death by ending mechanical ventilation. These actions are commonly considered acceptable, however, because they alleviate pain and end suffering. Further, both are actions meant to benefit the patient. Nevertheless, if the administration of heparin will not, or will not be likely, to cause death, then its administration does not meet the criteria of doing harm and the action cannot be considered maleficence.

When considering beneficence and maleficence regarding heparin administration to the potential NHBD, it is important to remember that the potential NHBD will die of his or her injuries. This outcome is not changed by the decision to allow organ procurement or heparin administration.

JUSTICE

The ethical principle of justice, which is concerned with the allotment of scarce resources, allows the

administration of heparin to the potential NHBD. In this case, the scarce resource is the care given to the families facing an end-of-life event. It is arguable that two standards of care should not simultaneously exist, one for potential NHBDs and one for all others; however, in our present healthcare system, two standards of care do exist. The care and attention given to the families of potential organ donors may be greater than the care given to patients who are not potential organ donors. Potential donors and their families interact with OPO staff and facility social workers during this end-of-life experience, receiving emotional support and practical suggestions for improving end-of-life interactions. Often, OPO staff and facility social workers are assigned to these families as part of their role in the donation process and may encourage family members to clip a lock of hair or make a hand tracing of their loved one to help remember them. These members of the donation team are experienced in dealing with tragic circumstances, and they may help family members with a compassionate presentation of the grim prognosis and end-of-life options (S. Ross, personal communication, April 21, 2003).

Discussion

All treatment options for potential organ donors deserve dialogue and scrutiny by medical profes-

sionals, theologians, society members, and legal scholars, and new treatments should be presented to the public as they emerge.

For the organ procurement and transplant communities, it is important that their activities are communicated to the public clearly and openly. Public trust in organ donation practices directly affects the number of organ donations and transplantations; therefore, transplant facilities and OPOs must work to secure and maintain public trust.

Heparin administration to the potential NHBD could be considered a small aspect of the larger controversy of NHBD, and as such, could easily be overlooked or minimized. For proponents of NHBD, heparin administration may be given brief consideration. For opponents, it may herald the first step in the descent down the slippery slope between end-of-life care for the still-living potential donor and bettering the chances of successful transplant outcome for the recipient at the expense of the donor. Although these two are not necessarily mutually exclusive, it is imperative that an eagerness to procure viable organs not be the guiding force in NHBD protocols that allow the administration of heparin to the potential NHBD before the declaration of death.

It remains an inescapable fact, however, that organ donation is the answer to survival for those awaiting transplant.

References

- American Nurses Association. (2003). *Code of ethics for nurses with interpretive statements*. Washington, DC: American Nurses Publishing.
- Deglin, J. H., & Vallerand, A. H. (2003). *Davis's drug guide for nurses*. Philadelphia: F.A. Davis.
- Delmonico, F. L. (2003). Organ procurement. Retrieved March 17, 2003, from http://www.ots1.narod.ru/oxford/org_proc.htm.
- DeSpelder, L. A., & Strickland, A. L. (2002). *The last dance: Encountering death and dying*. Boston: McGraw-Hill Higher Education.
- Ethics Committee, American College of Critical Care Medicine, Society of Critical Care Medicine. (2001). Recommendations for nonheartbeating organ donation. *Critical Care Medicine*, 29, 1826–1830.
- Gersten, D. (2004). The modern oath of Hippocrates. Retrieved July 5, 2004, from <http://www.imagerynet.com/hippo.ama.html>.
- Herdman, R., & Potts, J.T. (1997). *Non-heart-beating organ transplantation, medical and ethical issues in procurement*. Institute of Medicine. Washington, DC: National Academy Press.
- Kopelman, L. (1985). Justice and the Hippocratic tradition of acting for the good of the sick. In J. C. Moskop & L. Kopelman (Eds.) *Ethics and Critical Care Medicine* (pp. 79–101). Dordrecht, The Netherlands: Reidel.
- Miller, G.W. (1971). *Moral and ethical implications of human organ transplants*. Springfield, IL: Charles C. Thomas.
- Orloff, M. S., Reed, A. I., Erturk, E., Kruk, R. A., Paprocki, S. A., Cimbalo, S. C., et al. (1994). Non-heartbeating cadaveric organ donation. *Annals of Surgery*, 220, 578–585.
- Reich, W. T. (Ed.). (1995). *Encyclopedia of Bioethics*. New York: Simon & Schuster Macmillan.
- Sifton, D. W. (Ed.). (2003). *Physicians Desk Reference*. Montvale, NJ: Thompson PDR.
- Sweet, W. (1981). *New England Journal of Medicine*, 299, 410–412.