

Virginia Henderson's principles and practice of nursing applied to organ donation after brain death

Registered nurses were some of the first nonphysician organ transplant and donation specialists in the field, both in procurement and clinical arenas. Nursing theories are abundant in the literature and in nursing curricula, but none have been applied to the donation process. Noted nursing theorist Virginia Henderson (1897-1996), often referred to as the "first lady of nursing," developed a nursing model based on activities of living. Henderson had the pioneering view that nursing stands separately from medicine and that nursing consists of more than simply following physicians' orders. Henderson's *Principles and Practice of Nursing* is a grand theory that can be applied to many types of nursing. In this article, Henderson's theory is applied to the intensely focused and specialized area of organ donation for transplantation. Although organ donation coordinators may have backgrounds as physicians' assistants, paramedics, or other allied health professions, most are registered nurses. By virtue of the inherent necessity for involvement of the family and friends of the potential donor, Henderson's concepts are applied to the care and management of the organ donor, to the donor's family and friends, and in some instances, to the caregivers themselves. (*Progress in Transplantation*. 2011;21:72-77)

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*The nurse is temporarily the consciousness of the unconscious, the love of life of the suicidal, the leg of the amputee, the eyes of the newly blind, a means of locomotion for the newborn, knowledge and confidence for the young mother, a voice for those too weak to speak.*¹

Nursing theorist Virginia Henderson (1897-1996), often referred to as the "first lady of nursing," penned these words in "The Concept of Nursing,"¹ in a section titled "Nursing's Unique Function." Of the 4 categories of nursing theory (metatheory, grand theory, middle range theory, and practice theory), Henderson's grand theory of activities of living provides a range of ideas that is broad enough for the theory to be applied to the donation process.²

For clarity, organ donor in this work is defined as an individual who is brain dead and is a candidate for solid-organ donation for transplantation. Although it is possible for living patients to donate some organs (eg, a kidney, a liver segment, the lobe of a lung),³ this article

is limited to deceased donors. (Note: Donation after cardiac death is another possibility for organ donation but is not discussed here either.) Nurse herein refers to both registered nurses practicing as organ procurement professionals or nurses practicing in the clinical setting, caring for a patient who has or may become an organ donor.

Among her comments about the nursing process, Henderson noted that "the best health care is patient-focused; better still, family-focussed [sic]."⁴ An indirect link also exists between the nurse caring for the organ donor and the patient or patients who might receive an organ or organs from the donor, in that the nurse's actions and care can affect the viability of the organs intended for waiting recipients. Although Henderson may have envisioned a sick or healing patient when she listed her activities for client assistance, her observation also applies to brain-dead patients. Regardless of the acuity of the patient, even if the patient is brain dead and a candidate for organ donation, Henderson's experiences, which she parlayed into a concept

and theory for nursing, give us the scaffolding on which to build excellent care.

Background

After serious injury of the brain and when death is imminent, the patient becomes a potential organ donor, usually when an established set of criteria, referred to as clinical triggers,⁵ are met, prompting a referral to the organ procurement organization with which the hospital is affiliated.⁶ The criteria might be a decreased score on the Glasgow Coma Scale, poor results of a neurological examination, or a physician's order to test for brain death.⁷ A procurement coordinator, a transplant professional trained in the donation process, responds on-site to the hospital to assess the situation and evaluate the potential for organ donation. The procurement coordinator may have a background as a physician's assistant, paramedic, or another allied health professional, but most are registered nurses.⁸

A key event in the process is declaration of death based on neurological criteria, or brain death, an irreversible cessation of all brain functions, including the brainstem. Most of the 50 states in the United States have adopted the Uniform Determination of Death Act, governing the declaration of death. Although this law requires the physician to use "accepted medical standards," it does not define what those standards are.⁹ Most laws leave the mechanism for testing to the physician, but most physicians rely on a combination of cranial nerve examination and apnea testing, taken together with the full clinical picture, including nature and mechanism of injury, normothermia, absence of sedatives, and normotension.⁹ An apnea test requires determination of baseline levels of blood gases, followed by disconnection from the ventilator for a time, followed by a second blood gas test.¹⁰ The main indicator of brain death is apnea, a 20 mm Hg increase in the level of arterial carbon dioxide over baseline, coupled with a failure to breathe.⁹ In the absence of brainstem reflexes and with no other explanations for the symptoms, brain death is declared. The time of death is documented by a licensed physician when it has been determined that the patient has met the criteria. If more than 1 examination is performed (eg, in states that require 2 independent examinations), time of death is the time of the second confirmation.² A search is performed for any organ donation decision made by the patient before death, often referred to as first-person consent.¹¹ In the absence of a first-person consent document, the decision about organ donation falls to the legal next-of-kin in hierarchical order, including health care power-of-attorney.¹²

Henderson identified 14 activities for patient assistance that she believed would help return patients to independence. Although it is clear that a brain-dead patient will not be returned to independence, a nurse

practicing Henderson's theory can be the voice unheard, ensuring that the decisions the patient made while still independent are realized. As a nurse educator, theorist, and researcher, Henderson derived much of her concept from her practice and education.¹³ She wrote of the difficulty of pinning down 1 nursing process, proposing instead that the nursing process be "an analytical process . . . used by all health care providers."¹³

Application of Henderson's Model to the Management of Organ Donors

Normal Breathing

Henderson's first activity is "normal breathing."¹³ Potential organ donors have suffered devastating neurological injuries, either from internal malfunction (eg, ruptured aneurysm, intracranial hemorrhage) or external injury (eg, gunshot wound, hanging). With the body's automatic systems severely compromised, it is important to establish and maintain adequate oxygenation. If the patient has lost the ability to breathe independently, intubation and ventilation is necessary and is not negotiable in a brain-dead patient. This intervention is typical in trauma response care, but an astute nurse who is aware that organ donation may be possible will understand the effects that early airway and oxygenation management will have on organ viability later.¹⁴ Inadequate oxygenation in the early hours can damage or destroy organs.¹⁵ Because of the physiological assault on the body from a severely injured brain, an imbalance in the body's circulating blood volume, which should be rich with oxygen, can occur. An imbalance can compromise or destroy organ function, if oxygenation is insufficient.

Eating and Drinking

"Eating and drinking"¹³ are the next activities that Henderson names. Neurological devastation completely eliminates the patient's ability to voluntarily take nutrition. The critical hour between the initial injury and the determination of brain death requires a shrewd nurse who can suggest fluid and electrolyte infusions, along with possible blood product transfusion, to maintain organ function, and pharmacological interventions, such as administration of desmopressin acetate and mannitol, to prevent diabetes insipidus, third spacing, or volume depletion. Nurses may need to assert themselves at this juncture. Physicians and others may see the situation as hopeless and begin to de-escalate care. If the primary health care team sees blood transfusion to a "hopeless" patient as unnecessary and wasteful, they may need instruction and reminders about the potential recipients of donated organs should the patient in question become an organ donor. Because of the catastrophic instability and increased metabolic rates due to stress in potential organ donors, liver glycogen stores are depleted.¹⁶

Although most organ procurement organizations do not include nutritional supplementation in organ donor management, some evidence suggests that the potential organ donor would benefit from supplementation of dextrose, amino and fatty acids, and glutamine.¹⁷ Nutrients such as dextrose, glutathione, adenosine, and raffinose are included in the various preservation solutions delivered directly to the organs during recovery and transport.¹⁸ For the potential organ donor, Henderson's concept of assisting a client to "eat and drink adequately" is expanded to establishing and maintaining hydration and normovolemia to support adequate organ function.

Elimination of Body Waste

Henderson lists "elimination of body waste"¹³ as the third activity. When brain function is impaired, production of antidiuretic hormone often decreases and halts completely with brain death. Kidneys are often highly sensitive to this injury and frequently respond by decreased urine output, diabetes insipidus, or other anomalies. The nurse, who understands the delicate balance between kidney function and many other body systems, will know that monitoring organ function through laboratory testing at regular intervals is essential and will suggest interventions as needed. Insightful nurses who are working with potential organ donors also understand that fluid overload is often an unfortunate side effect of trauma care—although it may not be evident for several hours—so the nurses will monitor multiple indicators (eg, arterial and/or central catheters) and suggest interventions to maintain stability.

Desirable Posture/Sleep and Rest

Consider Henderson's next 2 activities, to "move and maintain desirable postures" and "sleep and rest"¹³ together. Neurological devastation precludes all voluntary movement. As one would with a comatose patient, the nurse ensures frequent repositioning of the patient to prevent skin breakdown, pulmonary infiltrates, and pneumonia.¹⁹ Lungs for transplantation are difficult to maintain, and the same compromises one would anticipate in any other bedridden and immobile patient apply to brain-dead potential organ donors. Lungs that might ultimately be transplanted into another patient need intensive care in order to optimize their function.

Select Suitable Clothing: Dress and Undress

Henderson's next activity is "to select suitable clothes—dress and undress."¹³ In the case of brain-dead potential organ donors, the same respect for modesty and dignity are in order as with any other patient. Maintaining proper covering for the potential donor reminds others that the donor's value as a

human person is not lost to the circumstances leading to death. Nurses caring for potential donors must remain mindful that the donor in their care may have links to other living patients. The potential donor has worth, and the nurse can preserve the dignity that goes with his or her worth. Basic nursing instruction teaches us to preserve privacy and maintain proper draping. In the surgical suite, the culture regarding surgical recovery of organs can be uncomfortable for nurses and others who are not familiar with the process. The nurse working in organ donation will be the guardian of that privacy throughout the process, including in the surgical suite, assuming donation occurs.

Avoid Dangers in the Environment and Avoid Injuring Others

Henderson is conscious of the environment in her theory, as seen in the next activity: "Avoid dangers in the environment and avoid injuring others."¹³ An example of the prevention of injury to others in transplant is the testing done to ensure safety of the donated organs. Many of the preceding interventions—ventilators, heat lamps, appropriate cover—are part of the environment, but nurses are also responsible for protecting the emotional environment surrounding organ donation, both for the potential donor's family and for the hospital staff working with the patient. Studies indicate that more than 66% of family members visiting in the intensive care unit experience symptoms of anxiety or depression.²⁰ Volumes have been written about death and grief, but no one can predict how any person, including members of the health care team, will respond to the death of a patient. Brain death often complicates the situation, because the dead person's physiological functions are maintained by mechanical ventilation and administration of intravenous fluids, vasopressors, and other medications, and vital signs are routinely monitored. The observer sees a patient in a hospital bed, in an intensive care unit, with a rising and falling chest, skin that is warm to the touch, and other functions that mimic typical living patients. Families, often in sensory overload, find this confusing and may be more vulnerable and have difficulty differentiating brain death from a comatose state.¹⁹

It can also be challenging for nurses to reconcile the visible with the invisible. Nurses may need to review the fact that without the ventilator there would be no breathing and may need to allow the patient's family to be present during apnea testing. The nurse may need to review the legal and ethical definitions of brain death and review the criteria under which brain death is determined. The nurse's understanding of, and comfort with, brain death is essential. If a patient's family perceives uncertainty from the nurse, they may be hesitant to trust a brain death declaration, which may adversely affect organ donation.²¹ The situation

can cause fragile emotions, which left unchecked, can lead to a difficult environment.

Maintain Body Temperature Within Normal Range by Adjusting Clothing/Modifying Environment

“Maintain body temperature within normal range by adjusting clothing and modifying environment” is Henderson's next activity.¹³ Along with loss of voluntary nervous control, neurological devastation also compromises the hypothalamus, weakening the body's ability to regulate temperature. It is not uncommon for a brain-injured patient to experience body temperatures ranging from hypothermic to hyperthermic. Hyperthermia increases the metabolic and oxygen consumption rates. Hypotension causes a left shift in the oxyhemoglobin dissociation curve, impairing oxygen delivery to the tissue and decreasing the ability of the kidneys to concentrate urine. External adjustments are required to prevent further damage.¹⁶ Additionally, some patients who become donors have succumbed to meningitis, either bacterial or viral, which causes even more temperature fluctuation. Warming—or cooling—the patient should be a routine part of trauma care, and, as Henderson implies, the nurse provides this care when the patient cannot. The nurse must respond to temperature extremes with cooling blankets, heating lamps, or other technological interventions.

Grooming/Protecting the Integument

Next on Henderson's list of activities is “keeping the body well groomed and protecting the integument.”¹³ Protection of the skin and basic cleanliness are 2 activities that provide opportunities for nurses to interact with patients in a very caring and nurturing manner. While respecting the patient's privacy and dignity, the act of bathing the patient and providing skin protection, as well as the physical motion, can be an extension of the care the nurse is providing. The goal for brain-dead patients is not recovery, but the caring measures provided by the nurse send important messages to the patient's family about the scope of the care being given. A family facing a ventilated, but dead, loved one can be devastated. Seeing their loved one disheveled, bloody, and unclean can make the situation worse. By the time the brain-injured patient is admitted to the intensive care unit, time must be made to take care of the patient's basic grooming needs. The nurse may want to encourage the family to participate in this type of care.

The nature of the injury and the presence of unfamiliar medical equipment may leave the family deprived of the experience of being with or caring for their loved one. The simplest acts of love, such as stroking an arm, smoothing of sheets, combing of hair, or holding a hand are extremely valuable to a grieving family.²² Also of paramount importance, proper care

of all invasive sites, through bathing, can help control infection. In-line suction and frequent oral hygiene are helpful in minimizing the risk of hypoxemia and infection, particularly ventilator-acquired pneumonia.¹⁹ Until a patient is declared dead, everything possible must be done to save his or her life. If death comes, practitioners are equally bound by relationships to those important to the patient to deliver appropriate postmortem care. Showing respect, compassion, and empathy are all efforts that can help a family experiencing the death of a loved one in the intensive care unit.²³

Communication With Others

The next of Henderson's activities is of critical importance to the nurse facilitating organ donation: “Communicate with others in expressing emotions, needs, fears, or opinions.”¹³ The nurse would communicate to the patient in soothing, reassuring tones, explaining everything that is going on, announcing procedures, and generally comforting the patient. This type of communication is appropriate until death is determined. Once death has been determined, however, it is important that the nurse cease any verbal communication directed toward the patient. Speaking directly to the patient could send a confusing message to the family. Spending additional time with families, explaining brain death and allowing them to ask questions, will enhance their experience at the end of life.²³ In addition to the family and friends of the patient, the nurse may find that other nurses and even physicians may need gentle, clear communication in order to come to grips with the situation. Young patients, patients who are victims of senseless trauma, and patients with whom the staff is familiar can make death more personal and difficult to handle. Organ donation nurses must call upon their skills to actively listen, probe, and provide concise, honest answers. Clear, consistent communication is critical.

Nurses should take great care in the use of specific language when communicating with the family. When a patient is declared brain dead, health care professionals commonly use terminology such as “brain-dead” rather than “dead” and “life-support” when referring to the ventilator. These terms can be confusing to the patient's family. Using the term “dead” sends a more definitive message to the family that their loved one is, in fact, dead.²² Terms such as “retrieval,” “procurement,” and “harvest” are often used to describe the surgical procedure through which organs are removed from the donor. Richardson²⁴ argues that the word “retrieval” implies that the organs belong to someone other than the donor and we are merely taking them back while “procurement” refers to commerce and commodities and tends to focus on the recipient rather than the donor. Although one might

argue that “harvest” refers to a time of plentitude and thanksgiving, harvesting of crops was traditionally done by “sickle or scythe, the same implements used by the Grim Reaper, Death.”²⁴ For these reasons, nurses should use the term recovery. Recovery implies healing, and although the donor will not be healed, it can aid in the healing of the donor family by offering some solace or comfort in their grief by looking at donation as a way to bring meaning to the death of their loved one.²² Many people encounter organ donation with misconceptions that nurses should work to correct, and nurses must do so with great finesse so as not to undermine individual belief systems or values.

Worship According to One’s Faith

Henderson lists “worship according to one’s faith” as the next activity.¹³ Most of the practice of nursing, and certainly death and dying, may prompt nurses to call upon their own spiritual beliefs. Patients and patients’ families may have different beliefs, which nurses must respect. Nearly all religious groups support organ donation as long as it does not impede the life or hasten the death of the donor.²⁵ In the case of an organ donor, clergy may be called in to support the family. When considering donation, the family may look to a faith leader for answers.²⁵ Nurses may find opportunities not only to communicate information to the clergy, but perhaps also to facilitate worship or end-of-life rituals for the family at the bedside to outwardly express their grief.²⁶ Additionally, repeated exposure to episodes of death may prompt nurses to further explore their own spiritual journey and give them a choice to participate in worship as grief support for themselves.

Play and Recreation

“Play and recreation” are next on Henderson’s list of activities.¹³ Nurses working in organ donation will encounter many situations where play has gone horribly wrong. Children playing with guns, teenagers hood-surfing, people diving into shallow water, various vehicular accidents, and other common recreational activities that simply go wrong are examples of play leading to death. It is not uncommon for the patient’s family to experience guilt and self-blame. Nurses may find that the patient’s family and friends blame the event, the equipment, themselves, or each other for the death of someone they love. Nurses may need to remind them of the specifics of the event and that bad things sometimes happen. Nurses may also find themselves needing a reality check of their own to make sure they do not become unreasonably overprotective or careful to the point of inactivity. Play and recreation will no longer apply to the organ donor, but remain important for the family and for the health care team. The family may benefit during times of tragedy by

going outside, walking around, or by just experiencing their heartache.²⁶ Nurses may need to remind patients’ families of the need to take care of themselves.

Nurses must also recognize the need for their own care. As a consequence of stress relating to caring for suffering patients and their families, caregivers can experience compassion fatigue, a secondary traumatic stress disorder.²⁷ Recreational activities such as taking a walk, hiking, biking, running, or other forms of physical activity recharge the spirit and help combat compassion fatigue.²⁶ The bedside nurse and donation coordinator may also find themselves susceptible to the same stress a caregiver experiences and may benefit from the interventions described.

Learn and Discover

Henderson’s last activity for the client/patient is to “learn, discover, or satisfy the curiosity that leads to normal development and health and use the available health facilities.”¹³ Again, the activity is no longer relevant for brain-dead patients; however, many families of donors may be encountering grief and bereavement for the first time. Most people who are experiencing grief benefit from information, education, and ongoing support. A mourning family begins at the bedside to transition the relationship with the decedent from one of presence to one of memory.²⁶ Nurses have opportunities to provide grief support initially and to give some guidance to the family—and perhaps other health care staff—through resources for grief. Nurses should affirm the normalcy of family members’ feelings.²⁵ The nurse may stay in contact with the family after the donation. The nurse may choose to study more about grief and grieving and may write or design programming to support the families of donors. The nurse may also vigorously pursue more education about physiological management of organ donors, or about teaching others, or about nursing in general. According to Henderson,¹

of all health providers, nurses render the most intimate personal service. . . . Perhaps the quality people most often seek in the nurse is that of a comforting presence. If there is a universal concept of nursing it embodies the characteristics of a service that is intimate, constant and comforting.

Conclusion

Virginia Henderson’s Activities for Client Assistance within her concept of nursing apply logically and easily to the complex process of organ donation for transplantation. Applied within the broader context of the nursing metaparadigm—person, environment, health, and nursing—Henderson’s activities provide an excellent framework within which nurses can work

competently. Henderson was cognizant of the need to include the patient's family, and her tenets work equally well in caring for them. Nurses must advocate for patients. Unfortunately, not all health care professionals, including physicians and nurses, understand brain death.²⁸ It can be an ethical minefield if the health care team compromises care that could save the patient's life, fails to take appropriate actions to preserve organ function, or takes actions incongruent with the Nurse Practice Act.

Henderson said of her theory that "the complexity and quality of the service is limited only by the imagination and the competence of the nurse who interprets it."¹ She also alluded to nurses' autonomy. Expanding opportunities for nurses to specialize in advanced practices, such as organ donation and transplantation, is an ideal fit for Henderson's concept of nursing. The activities she lists as crucial elements of excellent patient care extend to the patient's family, and in the case of organ donation, to the recipients of donated organs. The nurse who applies Henderson's concepts throughout the donation process will contribute significantly to transferring the gift of life from one human being to one or more patients at the next phase of the donation process.

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