

Left Ventricular Assist Device Deactivation: Ethical Issues

More than 5 million Americans live with the diagnosis of heart failure (American Heart Association, 2008). Within 1 year of diagnosis, about 20% of affected patients die; only 40%-60% of patients with heart failure survive 5 years after diagnosis (Costanza, Mills, & Wynne, 2008). For patients with intractable symptoms, a heart transplant is the standard surgical procedure. However, over 3,200 individuals were on the waiting list for heart transplant as of December 2010 (Organ Procurement and Transplantation Network, 2010). While waiting for a donor heart, many patients are supported with a left ventricular assist device (LVAD) as a *bridge to transplant* (Mueller et al., 2010). Since 2002, LVADs have been considered *destination therapy* (DT) for patients who are ineligible for transplant as well as for patients with estimated 1-year mortality greater than 50% with medical therapy (Grady & Shinn, 2008). At the Mayo Clinic (Rochester, MN), the 2-year survival rate for patients treated with LVAD/DT was 74% (Boilson et al., 2009). This result suggests a promising long-term treatment for patients with severe heart failure.

However, LVADs are not problem free. Complications may include stroke, infection, multi-organ failure, hemorrhage, or device malfunction (Slaughter et al., 2009). Patients or their surrogates thus may conclude the LVAD is more burdensome than beneficial and request withdrawal of the device (the device is turned off). Because the LVAD is a new technology, some nurses might see the request to remove this life-sustaining treatment as different from mechanical ventilation or hemodialysis, as some other clinicians do. The focus of this article will be on ethical issues surrounding these requests. Arguments supporting these requests, as well as arguments against honoring these requests, will be presented. This article will end with discussion of the nurse's role in prevention and resolution of associated ethical issues.

Futile and Non-Futile Cases

In futile situations, acute life-threatening pathophysiologic conditions will progress to death despite life support. In such situations, life support is an obstruction to the natural process of dying and clinicians should withhold/withdraw burdensome, death-prolonging treatments. What is futile care in this time of progressively improving heart pumps?

With continuous-flow pumps, patients with heart failure likely will face futile care issues not related to cardiac conditions, such as renal failure, dementia, or infection (Brush et al., 2010). Infection that is unresponsive to surgical or medical treatment is one of the common problems with a LVAD. It may cause patients to choose to discontinue device support.

Rady and Verheijde (2010) argued that in all non-futile cases, compliance with patient or surrogate request to deactivate the device amounts to physician-assisted death "because of the pathophysiology induced by turning off of these medical devices, as well as the intention, causation, and moral responsibility of the ensuing death" (p.15). They contended that turning off the LVAD or mechanical ventilation is allowing a patient to die "only if concurrent lethal pathophysiology conditions present are unrelated to those functions already supported by medical devices in destination therapy" (p. 15). In both permanent mechanical support of respiration (e.g., patient with quadriplegia) and cardiac function (e.g., use of LVAD/DT), the natural essential functions are irretrievably lost. However, many clinicians and ethicists see the patient's death caused by withdrawal of mechanical ventilation as rooted in impaired lung function, and death from withdrawal of a LVAD as based in the underlying cardiac disease (Bramstedt, 2004; Brush et al., 2010; Dudzinski, 2006; Mueller et al., 2010; Simon & Fischbach, 2008).

Ethical Arguments For and Against Deactivation

Some clinicians or ethicists argue against deactivation of a LVAD; the two most common arguments are presented. The first argument is that withdrawing this life-sustaining therapy is physician-assisted suicide or euthanasia. The other position argues that a LVAD is different from other continuous life-sustaining therapies because it is a constitutive therapy (Lampert et al., 2010).

Physician-assisted dying versus letting patient die. Asscher's (2008) philosophical approach identified deactivation as killing, not letting die. His focus was on "surrounding responsibility" — the responsibility for the situation that surrounds the event. He stated, "...when an agent is already responsible for the surrounding situation, the agent cannot avoid that responsibility by letting die..." (p. 279). Physicians who implanted the device have surrounding responsibility. Rady and Verheijde (2010) viewed the pathophysiology induced by turning off the LVAD as intentional action, causative of the patient's death, and a morally wrong act of killing. Their view is that LVAD deactivation is ethically permissible

only when the underlying pathophysiology (e.g., central nervous system hemorrhage, multi-organ failure, cancer) causing the death is unrelated to the cardiac functions already supported by the LVAD.

Constitutive therapy argument. Lampert and co-authors (2010) outlined a second argument for not discontinuing a LVAD: it is a constitutive therapy — “takes over the function that the body can no longer provide for itself” — versus a regulative therapy — “coaxes the body back toward its own homeostatic equilibrium” (e.g., implantable cardioverter defibrillator shocks to restore sinus rhythm) (pp. 1011-1012). Simon and Fischbach (2008) agreed, arguing that “although LVADs are neither fully implantable nor a full replacement for a heart, they share many ethically relevant features with true artificial organs” (p. 14). “It is an integrated part of an independently functioning organism” (p. 10). Because a patient’s biological heart is not removed in futile situations, the argument is that his or her LVAD also should not be deactivated. Nevertheless, precedent exists for the withdrawal of other constitutive life-sustaining therapies, such as mechanical ventilation, as well as artificial nutrition and hydration, when the patient or surrogate decision maker no longer wants the treatments.

Arguments for deactivation center on patient autonomy, beneficence, and weighing of benefits and burdens (Bramstedt, 2004; Brush et al., 2010; Dudzinski, 2006; Mueller et al., 2010; Simon & Fischbach, 2008; Wiegand & Kalowes, 2007). Time after time, American courts have upheld the patient’s right to refuse treatment and request withdrawal of any treatment, even if the treatment prolongs the patient’s life and not using it causes the patient’s death. This right of refusal extends to any treatment for which the patient gave previous consent (Dudzinski, 2006; Mueller et al., 2010; Pellegrino, 2000). The benefit of life extension, as well as improved mobility and functional status, may at some point become outweighed by the burdens of LVAD complications, device malfunction, or other illnesses (Rizzieri, Verheijde, Rady, & McGregor, 2008).

“Religious justifications for deactivation are explicitly available in many religious traditions and tacitly assumed in others” because the choice is to let life go and not directly kill (Lampert et al., 2010, p. 3014). Furthermore, major religions support patient choice concerning withdrawal of treatment when the burden of the treatment is unbalanced to the benefit. Should a nurse’s religious beliefs lead to a different assessment, the nurse can refuse to participate because of conscientious objection as outlined in the *Code of Ethics for Nurses* (American Nurses Association [ANA], 2001).

Nurse’s Role in Resolution of Ethical Issues in Deactivation of LVAD

Three qualitative studies about patients with LVADs point to the ethical obligation of nurses to provide significant emotional support. In the first study, nurses viewed hospitalized patients and their families necessitating wide-ranging emotional support for adjustment to the

device (Embry & Zambroski, 2006). Nurses reported additional need for psychological support beyond that required by other chronically ill hospitalized patients. The second study pointed to the profound disturbance of body and self in six patients, and their need for significant psychosocial support (Chapman, Parameshwar, Jenkins, Large, & Tsui, 2007). In a third qualitative study of six patients, this need for psychological support emerged in four themes: facing the unknown, feeling confined, living with fear, and hope for the future (Zambroski, Combs, Cronin, & Pfeffer, 2009). These emotions are likely to be intensified at the end of life, when the hope for a functional lifestyle fades. Nurses have an ethical obligation to provide this emotional support and/or access resources for the patient and family.

Casida and Magnan (2009) organized the care needs of patients with a LVAD from a nursing perspective. They determined nurses need to know how to manage a LVAD under three conditions: (a) normal operating conditions, (b) pump malfunction, and (c) pump failure. They further outlined the needs of the patient under these three conditions.

Two studies examined the withdrawal of the LVAD and reached similar conclusions on needed preoperative preparation and end-of-life care (MacIver & Ross, 2005; Mueller et al., 2010). In a study by MacIver and Ross (2005) at Toronto General Hospital, 22 patients underwent implantation of VAD and seven patients died following withdrawal of this life support. Mueller and colleagues (2010) studied 68 patients who underwent LVAD implantation at the Mayo Clinic (Rochester, MN) between March 2003 and January 2009. Of these, 14 patients or their surrogates requested withdrawal of LVAD. Because only 2 of the total of 21 patients undergoing withdrawal of LVAD in these two studies had decision-making capacity, the decision fell on the surrogates. Prior to device removal, multidisciplinary case conferences were used for 15 of the 21 patients to facilitate discussion among clinicians and with surrogates.

In the study by Mueller and colleagues (2010), only 7 of the 14 patients had an advance directive and none mentioned LVAD withdrawal. What changes in approach resulted from this study? The Mayo Clinic now creates a preparedness plan, similar to the preoperative plan of Toronto General Hospital, with the three components shown in Table 1 (MacIver & Ross, 2005). The decision to begin is as least as important as the decision to stop; it is important to elicit the patient’s values and views on quality of life and end of life when he or she is still capable of reflection.

Rizzieri and co-authors (2008) outlined specific requirements for informed consent in detail. According to the *Code of Ethics for Nurses* (ANA, 2001), nurses have a responsibility to assure the patient understands these requirements. Open discussion of the effect of a LVAD/DT on caregivers is an important dimension of the informed consent process. The physical, psychological, and financial strains on caregivers need open discussion and possible referral to support groups. All patients also should receive consultation from palliative care specialists when

TABLE 1.
Preoperative Preparation for Ventricular Assist Devices

1. Informed consent
2. Advance care planning
3. Potential need for device withdraw

they are being considered for a LVAD/DT. These advance care planning discussions with palliative care clinicians can smooth the possible transition to elective deactivation of the device.

The patient and family need assurance the patient's symptoms at the time of deactivation will be managed, just as the dyspnea, chest pain, and anxiety of any patient with advanced heart failure who is dying (Brush et al., 2010). For this reason, palliative care experts need to be included in the preoperative conversations and at end of life. However, nurses in any specialty potentially could care for a patient with a LVAD at end of life because he or she could be dying of cancer or any other end-stage neurological, endocrine, or renal disorder.

Conclusion

As a bridge to transplant or as a destination therapy, LVADs will be seen by nurses in an increasing number in the clinical arena because of the growing number of patients with heart failure. Arguments against deactivation of a LVAD focus on physician-assisted dying and constitutive therapy. Arguments for the permissible deactivation focus on the autonomy of the patient, weighing of benefits and burdens, and the long-standing support of legal and ethical systems for patient rights to refuse any treatment. Lampert and co-authors (2010) concluded deactivation of a LVAD is not assisted suicide or euthanasia, and is ethically and legally permissible. The nurse's role with the patient with a LVAD centers on prevention of ethical issues by assuring informed consent and advance care planning, including the potential need for device withdrawal. Research suggests a significant need exists for psychosocial support for the patient with a LVAD, and nurses are in a key position to provide this support. Finally, nurses need to pledge to the patient with a LVAD and his or her family that physical and psychosocial needs will be met when the decision is made to deactivate the a LVAD. Nurses need to guarantee palliative care will be part of the patient's preoperative and end-of-life experience. **MSN**

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