

CASE AND COMMENTARY

How Should Physicians Respond to Requests for LVAD Removal?

Larry A. Allen, MD, MHS

Abstract

Mechanical circulatory support devices, including left ventricular assist devices (LVADs), have become mainstream treatment for end-stage heart failure. LVADs are ethically and legally no different than other types of life support, for which patients have a right to decline or withdraw care consistent with the principle of respect for autonomy. However, the realities of LVAD complicate informed consent and shared decision making. LVAD candidates are often older and have multiple illnesses. And life with an LVAD requires a period of comprehension, adaptation, and reintegration. Therefore, clinicians must assess LVAD candidates' decision-making capacity, screen and possibly consult for depression, seek to understand whether being on LVAD is consistent with patients' values, consider temporary support options to allow for goals clarification, and ask for help from family and palliative care specialists.

Case

RM is a 71-year-old man in heart failure (an inability to maintain sufficient cardiac output). He has a history of tobacco use, type 2 diabetes mellitus, chronic kidney disease, and ischemic cardiomyopathy (one cause of his heart failure). After collapsing at home, RM was intubated (by emergency medical service personnel) and brought to the hospital.

RM's numerous symptoms suggested he should be started on dobutamine, and he was admitted by Dr C to the cardiovascular intensive care unit (ICU). Despite aggressive ICU therapy, RM continued to decompensate. Dr C's team approached RM's spouse to discuss implantation of a left ventricular assist device (LVAD) as a "destination therapy." The team explained that, due to RM's advanced age, he would not be a candidate for a heart transplant and that he would depend on the LVAD to live. Dr C explained that an LVAD requires lifelong anticoagulation and that RM's connection to the LVAD carried a high risk of infection, bleeding, and other complications. RM's spouse gave consent for the LVAD, stating, "I want him to live."

Shortly after LVAD implantation, RM experienced an arterial clot that led to ischemia in his left leg, which necessitated below-the-knee amputation. Eventually, though, RM's clinical status improved, he was weaned from the ventilator and extubated, and, several

days after extubation, he fully regained capacity to make decisions regarding his care. He emphasized to Dr C that he did not consent to LVAD placement, and he did not wish to live with the risks of LVAD complications or with an amputated leg. RM requested that the LVAD be removed, understanding that he would die shortly after its removal by way of left ventricular failure and cardiovascular collapse. Although Dr C wants to support and respect RM's wishes, he feels that removing the LVAD means that he would have a key role in RM's death. Dr C wonders what to say and do.

Commentary

Situations like that of patient RM are becoming increasingly common in cardiovascular care.¹ Improved mechanical circulatory support technologies have expanded the routine use of durable LVADs in a wider range of patients, including people like RM who are not eligible for cardiac transplantation. Because an LVAD is generally reserved for patients with end-stage heart failure, patients might require emergent initiation of mechanical circulatory support in the setting of critical illness. Patients with heart failure proceed to LVAD surgery with significant medical problems; surgery is inherently dangerous; and complications afterwards occur in the majority of patients.² Thus, decisions to undergo LVAD implantation—and later to discontinue LVAD—can be horribly complex and emotionally distressing.^{3,4}

Judicial and Legal Considerations for LVAD Decision Making

Fundamentally, people have the [right to choose and refuse care](#). As my colleagues and I have written elsewhere,³ “The rights of patients or duly appointed surrogates to choose their medical therapy from among reasonable options”—including no intervention and termination of intervention—are grounded in the ethical principle of respect for autonomy⁵; judicial decisions such as *Cruzan v Director, Missouri Department of Health*⁶; and legislative actions such as the Patient Self-Determination Act.⁷ To choose, a patient or surrogate must be informed.

An informed patient is one who is aware of the diagnosis and prognosis, the nature of the proposed intervention, the risks and benefits of that intervention, and all reasonable alternatives and their associated risks and benefits. A major purpose of a high-functioning healthcare system is to provide the resources with which an activated, informed patient can engage in productive discussions with a proactive, prepared healthcare team.³

Because destination therapy LVAD involves surgical implantation of a durable pump that is intended to remain in place for the remainder of the patient's life and comes with a variety of burdens and lifestyle changes (in addition to commitment of significant resources), the stakes are particularly high. And the law does not distinguish varying degrees of dependence on therapies to be withdrawn.³

Ethical Considerations for LVAD Decision Making

In contradistinction to euthanasia, deactivation of a previously implanted LVAD does not introduce new treatment or an additional surgical injury and thereby allows patients to die from their original disorder.⁸ As such, withdrawal of LVAD support is not ethically different than withdrawal of other treatments. Nevertheless, as my colleagues and I have written elsewhere, “clinicians, patients, and families can consider scenarios in which withdrawal leads to direct and rapid patient demise as unique and emotionally difficult.”³ LVAD withdrawal typically leads to death in less than an hour.⁹ LVAD deactivation stands in contrast to turning off an implantable cardioverter defibrillator, which might not have obvious implications for survival until later, if at all.¹⁰ While withdrawal of LVAD support has been likened to withdrawal of ventilatory support, patients with an LVAD are more likely than patients with endotracheal intubation to be alert and oriented at the time of device deactivation.¹¹

One way to limit challenges of durable LVAD deactivation is to avoid implantation in the first place in patients for whom the device is not concordant with their values. In the setting of acute cardiogenic shock with loss of patient [decision-making capacity](#) (as was the case with RM), temporary mechanical circulatory support is usually preferred to going straight to durable LVAD, as did RM. Temporary treatment options can include percutaneous ventricular support and peripherally cannulated venoarterial extracorporeal membranous oxygenation (ECMO). Such an approach not only allows for more rapid and efficient stabilization of patients but also can allow time for other issues to declare themselves (eg, acute renal failure, anoxic brain injury) and for informed medical decision making to occur. In the case of RM, stabilization of the patient on temporary support might have allowed him to regain consciousness and discuss treatment decisions with his wife and family.

Moreover, the commitment of resources tends to be significantly less with temporary approaches than with durable LVAD. The relative gravity of some treatment decisions is illustrated by cardiac transplantation, in which a decision to implant a suitable donor heart takes a finite resource away from another likely deserving patient. Advanced heart failure programs that perform LVADs and transplants are graded on their outcomes, including short-term mortality, such that patient decisions not to “make the most” of their LVAD or transplant can put patients and clinicians at odds with each other.¹² Thus, creating opportunities to reasonably ensure patient and caregiver commitment prior to durable LVAD implantation might avoid downstream disappointment and conflict.

Responding to a Patient Who Requests LVAD Removal

Given that patients have the right to refuse or discontinue therapy, RM’s case starkly illustrates how life-altering events can acutely challenge patients’ ability to accurately forecast their future, including their ability to cope with new medical realities, and thus impair their decision-making capacity. Knight and Emanuel maintain that people with

life-threatening illness experience “multiple, accumulating, and profound losses of functions, abilities, roles, and relationships” and therefore “have to adjust psychologically to these losses.”¹³ Psychologically, waking up to find oneself dependent on an electrical heart pump and missing a leg is shocking; yet, sadly, many of us in the business of advanced heart failure and LVAD care have witnessed patients confronted with such scenarios. Traumatic medical events are often accompanied by patient and caregiver exhaustion, fear, and perceived loss of control.³ Depression and anxiety are common in patients with advanced disease and can affect information processing, memory, and executive function.³ When there are concerns that a patient’s decision-making capacity is impaired, that patient’s request for termination of life-supporting care can be deferred in order to work through a period of assessment, treatment, comprehension of and adaptation to one’s condition, and social reintegration, following Knight and Emanuel’s reintegration model.¹³ An agreed-upon trial period of days to weeks might help provide structure, facilitating potential adjustment and subsequent reconsideration of withdrawal.¹⁴ Meanwhile, screening for depression and anxiety, followed by pharmacological and nonpharmacological interventions (including psychological or psychiatric consultation), might be appropriate. Like most difficult situations in medicine, the optimal approach involves family members and various medical professionals working collaboratively to truly understand the patient’s state of mind, dominant values, and goals in order to best guide preference-sensitive decision making.

Assuming a patient like RM persists in requesting to withdraw care and the clinical team and family agree that he has adequate decision-making capacity, the obligation of the physician of record is to either directly help withdraw life-sustaining technology or find a proxy physician who will do so. Clinicians often bring their own cultural, religious, and personal overlay to these discussions.¹⁵ When a clinician’s own religious or cultural beliefs differ from a patient’s, such that the clinician does not feel comfortable fulfilling the patient’s request—and the request of the patient is reasonable within the law—it is the clinician’s professional responsibility to transfer care to someone who can carry out the patient’s wishes.

Thus, in this case of RM, Dr C should consider the following actions:

1. Assess RM’s decision-making capacity, being attentive to the potential overlay of delirium or acute depression.
2. Involve RM’s designated health care proxy (presumably his spouse), as appropriate.
3. Listen to RM (or his proxy) with the aim of understanding his hopes and fears, and assess whether the decision to withdraw the device is concordant with his stated values and goals.
4. Engage palliative care specialists with specific training in withdrawal-of-care situations, if available.¹⁶

5. Consider psychiatry consultation if there is concern about significant overlay of depression or other psychological disorder.
6. Consider a timeline that includes a deferred decision to allow for a trial period living with the LVAD and amputation.
7. Consider an ethics consult if the process does not lead to a clear shared decision.¹⁷

If the patient has decision-making capacity and consistently articulates values that are not consistent with life on LVAD support, then arrangements for withdrawal should be made either by the physician or by a willing colleague. Protocols for turning off LVADs are available to limit unnecessary patient suffering, avoid anxiety-provoking alarms, and ease bereavement of family members.¹⁸ Most LVAD deactivations occur in the hospital, but they can be performed at home.⁹ In the end, whatever RM decides to do is the right thing to do, as long as a thoughtful process is followed that respects his complex medical, ethical, and emotional realities.

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Larry A. Allen, MD, MHS is the associate division head for clinical affairs in cardiology and medical director of the Advanced Heart Failure Program at the University of Colorado Boulder. He also conducts research with the Colorado Program for Patient Centered Decisions. His work focuses on improving ability to anticipate progression into end-stage heart failure and helping patients make tough choices regarding invasive therapies and palliative options.

Editor's Note

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