Heart Transplantation at Penn Medicine - When to Refer, Evaluation Process, and Expanding the Donor Pool: An Interview with Rhondalyn C. McLean, MD

Podcast Transcript

Melanie Cole (Host): Welcome to the podcast series from the specialists at Penn Medicine. I'm Melanie Cole. And today, we're discussing heart transplantation at Penn Medicine, when to refer, the evaluation process and expanding the donor pool.

Joining me is Dr. Rhondalyn McLean. She's the Medical Director of Heart Transplantation at Penn Medicine. Dr. McLean, it's a pleasure to have you join us today. As we begin, can you touch on the key diagnoses and conditions for when heart transplant would even be considered?

Dr. McLean: Good morning and thank you for having me. In general, we consider heart transplant as the treatment of choice for end-stage heart failure. One of the most common diagnoses that leads to end-stage heart failure is ischemic heart disease. Those patients who have had heart attacks and/or who have had bypass surgery or stents placed account for a large proportion of the patients who are transplanted. Additionally, heart failure caused by congenital abnormalities, genetic conditions, or that is associated with a family history also make up a substantial portion of our transplant patients.

There are other disease processes that can cause heart damage like toxicities from drugs, particularly those chemotherapeutic medications used as a treatment for cancer. And lastly, there are some rheumatologic diseases like sarcoid or infiltrative diseases like amyloid that can lead to end-stage heart failure and necessitate an evaluation for heart transplantation.

Host: Well, thank you for that very comprehensive list. So heart transplantation in the US and at Penn has been prevalent for decades. Can you talk a little bit about the evolution as a treatment strategy for end-stage heart failure and the current long-term survival rates?

Dr. McLean: So that's a great question. In the 1960s, we realized that more people were dying of heart failure and that our treatments at the time were largely ineffective. We also knew the kidney transplants had been successfully performed in the late 1950s. Thus, in the late 1960s and '70s, we began

transplanting hearts. But pretty soon thereafter, the strategy of transplant was abandoned, mostly due to poor patient survival. Patients died of rejection of the new organ and also from infection.

In the 1980s, a revolutionary step occurred. There were newer anti-rejection medications that were discovered and heart transplant as a treatment strategy then became more prevalent and the treatment of choice for end-stage disease. Penn performed our first heart transplant in 1987 and, last year, proudly celebrated our 1500th transplant.

Patients who are diagnosed with heart failure, even if they are on the best medical and device therapy, have a 70 to 80% one-year mortality. Those are those patients with end-stage heart failure. With heart transplant, however, for the appropriate candidate, that 70 to 80% one-year mortality can actually turn into a one-year survival of about 92% and that survival is long-lasting. We know that the median survival for heart transplant recipients is approximately 13 years. That is at least 13 more years of life expectancy for our patients.

Host: That really is amazing. So can you tell us a little bit about the evaluation process at the Penn Transplant Institute? How is a patient referred for a heart transplant? How important is early referral in this process? And tell us about the guidelines providers should be aware of.

Dr. McLean: So a referral to heart transplant is usually initiated by an internist or a cardiologist whose patient is failing our usual invest medical therapy. That is they've been hospitalized for heart failure more than once in a year or they're no longer tolerating or responding to our medical therapy. Because we are a program that takes on the higher risk patients, patients are sometimes referred to Penn from other programs where the patient has been turned down for transplant. Occasionally, there are self-referrals of patients who need a second opinion about their specific case.

In any case, all patients coming into the outpatient referral process for heart transplant are guaranteed a visit with one of our transplant cardiologists within two weeks.

Becoming more common are those patients who were transferred from another hospital who were in peril of dying in the next few days. In these patients, there is an expedited inpatient evaluation by our multidisciplinary team in order to

determine their candidacy. We welcome these patients who are the sickest of the sick to our institution and ensure all options for advanced therapies, including ventricular assist devices and heart transplant are explored.

For all patients, inpatient and outpatient, a heart transplant evaluation is designed to answer two important questions. The first from a cardiac standpoint, will the patient feel better and/or live longer with transplant compared to other treatment options? And the second, are their comorbidities, either medical, psychological, social, or financial that make transplant unacceptably risky? Thus, the evaluation, including assessments by social work, cardiologists, surgeon, the nursing staff, pharmacy and nutrition focuses on these issues.

The true paradox of transplant is that we want patients to be sick enough to need the transplant, but also well enough to survive the surgery and have a good quality of life afterwards. And the key to this is the early referral because there is limited organ available. And we have a societal responsibility to carefully select the patients who are most likely to survive and do well. There are restrictions based on age and other medical co-morbidities. There are times when we are able to overcome some of those medical and social concerns for candidacy, so we encourage the referrals to our heart transplant program at Penn.

Host: So the allocation system for heart transplantation changed in 2018. Why did that happen? And what were the effects for people waiting for a heart?

Dr. McLean: In 2018, the change in the allocation system for our heart transplants took place to better ensure fair and equitable organ allocation to share the donor population over larger geographical areas and to reduce the waitlist time for the patients who are most critically ill.

Practically speaking, the result of the change is that the patients who are most likely to be transplanted are those who are the sickest and who are on mechanical support. Most of the other patients wait longer. Because that is so, it's important that patients are referred as early as possible so that we have the time to go through the evaluation phase and to get them to transplant.

So often we find that there is a rapid decline that occurs at the final course of disease. And we need to maximize our time with the patient to increase the likelihood that they will be a good transplant candidate. The earlier, the better for referrals.

Host: So Dr. McLean, many things are contraindicated and can exclude people from heart transplantation and hepatitis C infection used to be one of them. However, you took part in a study at Penn that involved transplanting hearts from individuals infected with hepatitis C into uninfected recipients. Can you tell us a little bit about this study and do you think it'll be an important aspect of expanding the donor pool for heart transplant in the future?

Dr. McLean: So, another great question. Hepatitis C is a viral infection that in general takes decades to become clinically significant. But in the 1990s and 2000s, when we looked at patients with hepatitis C who were transplanted, we noted that there was an increased risk of early death in that population of patients. So as you pointed out in your question, the presence of hepatitis C became a contraindication to transplant. We did not transplant patients with hep C nor did we use donors who had hep C.

In 2014, however, things changed. There were newer breakthrough medications that became available that cure hepatitis C in greater than 95% of those who have infections. At Penn, we subsequently carried out a study that use donor hearts that were hep C positive and transplanted those hearts into wait-listed patients without hepatitis C. After transplant, they were given the newer hepatitis C curative medications. For our study, all patients did become hepatitis C-positive after transplant, but all were cured using the medication, so it was as if they had not received a hep C-infected organ at all.

In the US in general, there are many fewer suitable organs available for donation than there are people waiting for those organs. And we also know that patients are removed from the waiting list because of death or progressive illness that render them too sick to undergo transplant. In this study, our hep C study showed that we can find creative ways to expand the pool of donors that were previously considered unacceptable and therefore be able to save the lives of more patients. It's estimated that we could potentially transplant approximately 700 people more if this strategy were to be used nationwide.

Host: What an interesting topic we're discussing today. And finally, Dr. McLean, what would you like other providers to know about heart transplantation at Penn Medicine? And what differentiates the program and the team? Tell us about the multidisciplinary approach and your unique team.

Dr. McLean: I'm awfully proud to talk about the things that distinguish, the Penn Heart Transplant Program from other programs. And in this, I believe that there are three main pillars that account for that differentiation. The first is the clinical expertise. We have a unique proficiency in treating complex heart conditions, including amyloidosis, hypertrophic cardiomyopathy, congenital heart disease, genetic myopathies and sarcoidosis.

We also have a program that supports multiorgan transplants, heart-lung, heart-liver, and heart-kidney. We know that compared to local regional and national programs, we transplant quickly and our patients are less likely to die on the waitlist. This, I believe speaks to our preoperative management of patients with end-stage heart failure, as well as through the appropriateness of the patients that we do list.

The second pillar is our personalized care. We offer a longitudinal care that's individualized across every phase of the transplant process to support treatment options, and also to support patient recovery. Additionally, we do this in concert, in collaboration with our referring providers. Patients will be able to be followed by us and the providers who have cared for them for years. We also make it logistically easier for patients as they are able to get some of their required testing locally. And we have expanded our use of telemedicine and other remote technologies, particularly for patients who live far away.

And the third pillar is Penn's research and innovations in which we are well-known for, from projects like using biomarkers to determine the likelihood of a rejection of an organ, our use of hep C-infected organs both as a research study and now more clinically, using mechanical devices to support or replace heart function. Penn remains at the forefront of cutting edge research to provide world-class care to our patients.

Host: Thank you so much, Dr. McLean, for joining us today. To refer your patient to Dr. Rhondalyn McLean at Penn Medicine, please visit our website at pennmedicine.org/refer or you can call 877-937-PENN. That concludes this episode from the specialists at Penn Medicine.