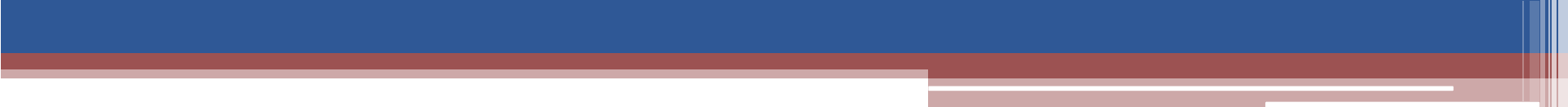


Suitable and high risk heart transplant candidate

Dr.Farah Naghashzadeh

Fellowship of heart failure & transplant

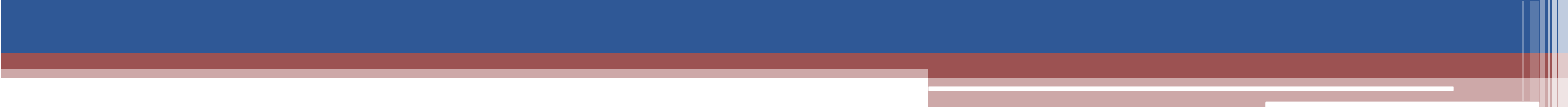
Shahid Beheshti university

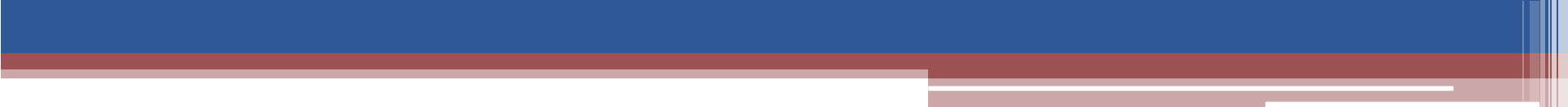
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- **Selection of appropriate candidates is very important for the best short and long-term prognosis.**
 - **At any instance, transplantation should be considered when the estimated survival following transplant is higher than that achieved with medical and/or interventional therapy and when the patient is willing and capable of adhering to the intense life-long therapy required for successful transplantation**



Listing criteria's for recipient

- **Late stage heart failure due to any cause**
- **Refractory life threatening arrhythmias despite optimal medication, surgical, and device therapy**
- **refractory angina not amenable to further revascularization**
- **complex congenital heart disease with failed surgical palliation or not amenable to surgical palliation at acceptable risk**


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- **Heart transplantation should be considered for patients with cardiogenic shock requiring MCS and those with low-output state requiring continuous infusion of inotropes, provided there is little chance of recovery and no irreversible end-organ damage.**
 - **Transplantation should also be considered for those ambulatory patients with NYHA functional class IIIB to IV heart failure symptoms whose peak exercise oxygen consumption (VO₂ max) by cardiopulmonary exercise test (CPET) is ≤ 10 – 12 ml/kg/min despite optimal medical therapy.**

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- **Risk stratification is a critical step in the evaluation for heart transplantation.**
 - **To do so, several factors must be considered, which include assessing the patient's current prognosis, the presence of co-morbidities that may preclude survival during heart surgery or survival on life-long immunosuppression, family support, and donor availability.**



Assessment of Severity of Heart Failure

- **Heart Failure Survival Score (HFSS)**
- **Seattle Heart Failure Model**
- **IMPACT Risk Score**
- **The recently revised 2016 ISHLT listing criteria recommend CPET and HFSS or SHFM for evaluation of ambulatory patients to guide listing for heart transplantation.**

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- **VO₂ max ≤ 14 ml/kg/min for beta-blocker intolerable patients or VO₂ max ≤ 12 ml/kg/min in beta-blocker patients**
 - **Moderate to severe risk of HFSS or SHFM < 80% patients can be considered for listing; however, listing solely by risk model is not recommended.**



Assessment of Risk Factors of Transplantation

- **Age**
- **Obesity and Donor-Recipient Size Match**
- **Assessment of End-Organ Function**
- **Pulmonary Hypertension**
- **Renal dysfunction**
- **Liver dysfunction**
- **Diabetes Mellitus**
- **Infection**
- **Malignancy**
- **Peripheral and cerebrovascular disease**
- **Psychosocial support**



Age

Increased recipients and donors age are associated with worse prognosis as co-morbidities such as ischemic cardiomyopathy, diabetes, renal dysfunction increased with age.

The incidence of renal dysfunction, non-lymphoma malignancy, and infection are higher in old age after transplantation.

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- **The 2016 ISHLT listing criteria recommend recipients aged ≤ 70 should be considered for transplantation; however, recipients aged > 70 may be considered carefully for transplantation.**

Obesity and Donor-Recipient Size Match

- **Obese patients are at higher risk for poor wound healing, infection, deep vein thrombosis, and pulmonary complications; they also have a shortened time to rejection, increased incidence of rejection, and coronary allograft vasculopathy.**
- **The 2016 ISHLT listing criteria recommend patients with BMI > 35 kg/m² should reduce weight before transplantation .**
- **Undersized hearts such as donor to recipient Body Mass Index (BMI) < 0.8 or female donor to male recipient had significantly poor prognosis in recipients with a high pulmonary vascular resistance (PVR) > 4 wood unit (WU))**



Assessment of End-Organ Function

- **Severe end-organ dysfunction is a poor prognostic factor and irreversible end-organ dysfunction is a contraindication for transplantation**

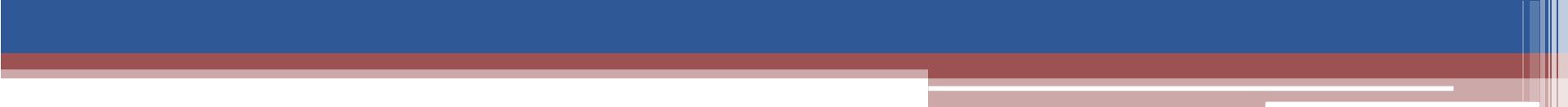
Pulmonary hypertension

- **2016 ISHLT listing criteria state that a PVR > 5 WU or PVRI >6WU or TPG >16–20 mmHg should be considered relative contraindication for heart transplantation.**
- **A PASP > 60 mmHg in addition to one of the former three variables or a PVR that can be decreased ≤ 2.5 WU at the expense of SBP < 85 mmHg increases right ventricular failure and mortality after transplantation.**



Chronic kidney disease

- **CKD is common in HF and CKD is a major long-term complication after heart transplantation. Renal dysfunction and heart failure are closely related and they affect each other adversely. CKD is a major long-term complication after heart transplantation and the development of CKD is associated with increased mortality after transplantation.**

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- **In the 2016 ISHLT listing criteria, elevated serum creatinine and eGFR should prompt an evaluation of intrinsic kidney disease and the presence of irreversible renal dysfunction (eGFR < 30 ml/min/1.73m²) is a contraindication for isolated heart transplantation**



Liver Dysfunction

- **liver enzymes are frequently increased in advanced heart failure as a result of hepatic congestion and less frequently ischemic injury in acute decompensated heart failure.**
- **Abnormal LFTs significantly increased 6-month mortality and abnormal AST/ALT increased 30-day mortality.**
- **Cardiohepatic syndrome had an important impact on prognosis in advanced heart failure .**



Diabetes Mellitus

- **Recipients who had diabetes before transplantation experience an increased rate of CAV and a decreased survival rate.**
- **In the 2016 ISHLT listing criteria, DM with end-organ damage other than retinopathy or poorly controlled diabetes (HbA1C > 7.5%) is a relative contraindication of transplantation.**



Psychosocial Support

- **Intense lifestyle modification, strict adherence to medication, emotional, and financial family support are necessary for the success of the complex and uncertain transplantation process. Therefore, an evaluation of the patient's cognitive function, psychosocial support, and familial support are necessary before transplantation. Tobacco use and alcohol intake are not only markers of poor compliance but they also increase the risk of CAV and malignancy and decrease survival after transplantation.**
- **In the 2016 ISHLT listing criteria, poor compliance, active smoking within 6 months, and alcohol abuse within 24 months are contraindications for transplantation.**

Matching high-risk recipients with marginal donor organs is a clinically effective strategy

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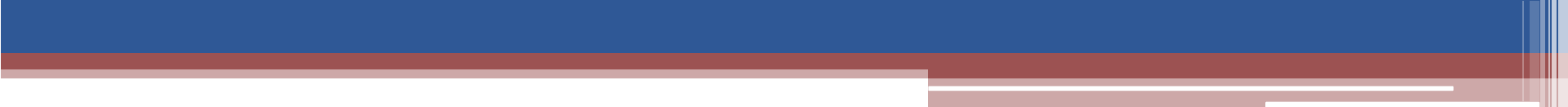
Abstract

BACKGROUND—The purpose of this study is to determine the clinical outcomes associated with Alternate Listing Transplantation (ALT) strategies.

METHODS—UNOS provided de-identified patient-level data. Primary analysis focused on patients undergoing heart transplantation between January 1, 1999 to December 31, 2005 (n=13,024). HR criteria included age [gt] 65yo, retransplantation, HepC+, HIV+, CrCl [It] 30 ml/min, DM with PVD, DM with Crcl [It] 40 ml/min. MD criteria included age [gt] 55yo, DM, HIV+, HepC+, EF [It] 45%, and dononrecipient weight [It] 0.7.

RESULTS—Survival in the standard transplant group was better than all other groups (p<0.001). With a median survival of 5.2 years, long-term survival was worst in the alternate listing transplant group (p<0.001). The standard transplant group also had the best transplant hospitalization outcomes, having the lowest incidence of in-hospital infection and dialysis (p<0.001). Alternate listing transplantations had the highest incidence of in-hospital infection (p<0.001). As expected, LOS for the transplant hospitalization was also shortest for standard list transplants, (p<0.001).

CONCLUSIONS—Pairing high-risk recipients with marginal donors is associated with greater morbidity and resource utilization compared with standard recipients and donors. Nevertheless, this strategy offers 5 years or more of additional survival to patients who otherwise would be expected to live 1 year or less. Therefore, ALT strategies appear to be a reasonable approach to extending the benefits of transplantation in the heart failure population. However, further studies examining the costs and quality of life related to this approach are needed.

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- **Findings demonstrate that Matching high-risk recipients and marginal donors offers a median survival of greater than 5 years to patients.**
 - **Additional findings here demonstrate that pairing high-risk recipients with marginal donor hearts is associated with greater morbidity and resource utilization compared with standard recipients and donors.**

Original Article

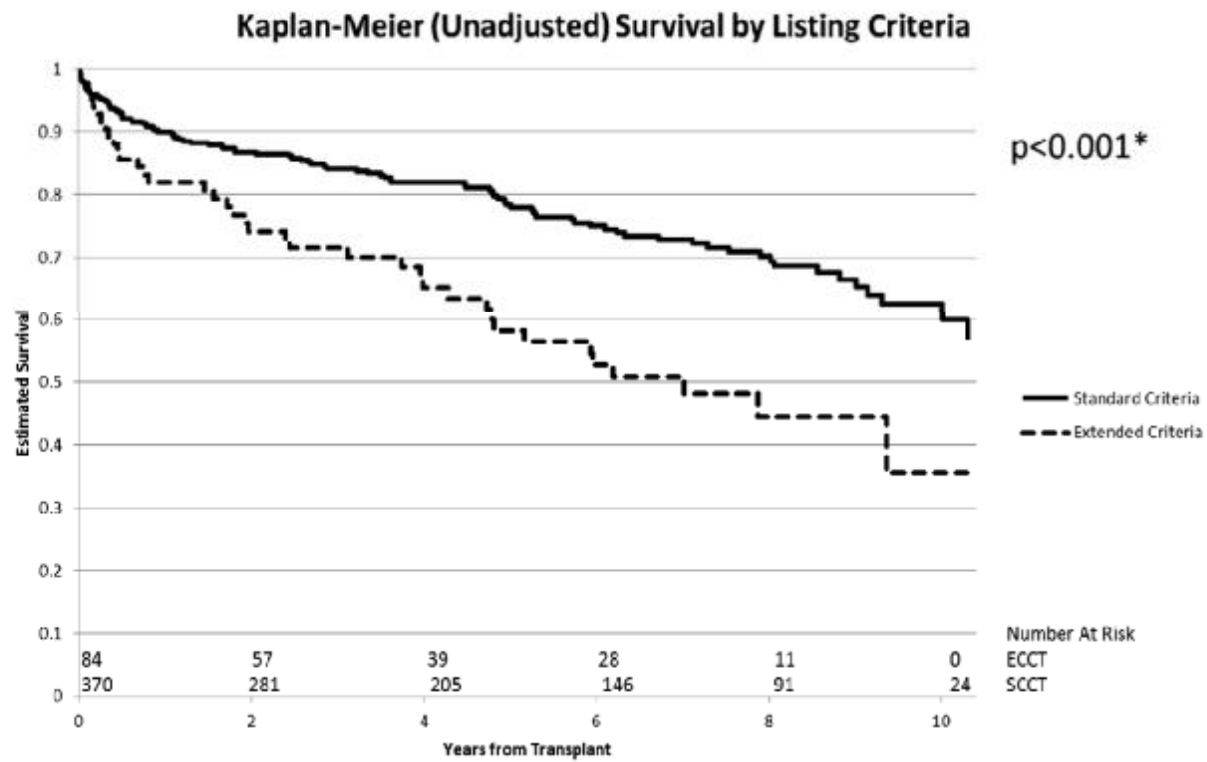
Ten-Year Experience With Extended Criteria Cardiac Transplantation

Marc D. Samsky, MD*; Chetan B. Patel, MD*; Ashleigh Owen, MD; Phillip J. Schulte, PhD; Jacob Jentzer, MD; Paul B. Rosenberg, MD; G. Michael Felker, MD, MHS; Carmelo A. Milano, MD; Adrian F. Hernandez, MD, MHS; Joseph G. Rogers, MD

Background—Extended criteria cardiac transplant (ECCT) programs expand the transplant pool by matching donors and recipients typically excluded from the transplant process because of age or comorbidity. There is a paucity of data examining long-term outcomes with this strategy.

Methods and Results—Between January 2000 and December 2009, adult patients undergoing isolated heart transplant were prospectively classified as ECCT based on prespecified criteria. Baseline characteristics and outcomes were compared between ECCT and standard criteria cardiac transplant recipients. Two Cox proportional hazards models were developed. The first to identify clinical variables contributing to survival between the 2 groups, and the second to determine the additional risk associated with assignment to ECCT. Among the 454 patients who underwent heart transplant, 84 (18.5%) were ECCT. Compared with the patients who underwent standard criteria cardiac transplant, ECCT patients were older (median, 66.6 years versus 53.2 years; $P<0.001$), with higher frequency of diabetes mellitus (46.4% versus 24.6%; $P<0.001$) and chronic kidney disease (median estimated glomerular filtration rate, 55 versus 61.6 mL/min; $P=0.001$). After adjustment for baseline characteristics, standard criteria cardiac transplant survival was higher than ECCT at 1 (89% versus 86%; $P=0.18$) and 5 (77% versus 66%; $P=0.035$) years. In a multivariate model that included listing criteria, creatinine (hazard ratio, 1.05 per 0.1 mg/dL; 95% confidence interval, 1.02–1.09; $P=0.001$) was a significant predictor of post-transplant mortality.

Conclusions—ECCT is an acceptable alternative for advanced heart failure therapy in select patients. Age and renal dysfunction are important determinants of long-term survival and post-transplant morbidity. (*Circ Heart Fail.* 2013;6:1230-1238.)



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- **After all, the selection of appropriate candidates and diligent aftercare of the transplant recipients is an art as well as a science**

