for skeletal muscle (~29 to 150 Hounsfield Units; Slice-O-Matic software). One-way ANOVA was used to assess variance across muscle CSA quartiles, with a post test for linear trend. Multivariable linear regression was applied to characterize the relationship between CSA and exercise capacity (6MWD), quadriiceps training volumes, HRQOL, and post-transplant hospital length of stay controlling for age, gender, BMI, and diagnosis.

**Results:** LTx candidates in the lowest CSA quartile (Q1: CSA ≤ 9 cm²) vs. highest quartile (Q4; CSA ≥ 17.5 cm²) were more likely to be female (86% vs. 5%), have lower BMI (22.4 ± 4.0 vs. 25.8 ± 3.8 kg/m²), and have COPD (60% vs. 19%), p < 0.01. 6MWD (Q1: 296 ± 113 vs. Q4: 390 ± 104 m), quadriiceps training volumes (Q1: 30 IQR [20-30] vs. Q4: 40 [30-60] reps* lbs), SF-36 physical function score (Q1: 16.7 ± 13.9 vs. Q4: 27.4 ± 18.0) and hospital length of stay post-transplant (Q1: 23 IQR [17-51] vs. Q4: 15 [14-43] days) improved linearly across quartiles, p < 0.05. A 10 cm² difference in CSA was associated with differences in 6MWD (8.2 m 95% CI 0.4-16.1), quadriiceps training volumes (2.5 lbs*Rep 95% CI 0.4-4.6), SF-36 physical function score (1.95% CI 0.4-2.7), but no significant difference in hospital length of stay (-3 days 95% CI -7 to 1.5).

**Conclusion:** Thoracic muscle CSA can be applied as a novel measure of skeletal muscle mass, which is associated with exercise capacity, quadriiceps training volumes and HRQOL. Thoracic muscle CSA may have utility in predicting post-transplant outcomes, but requires further study.

**Body Mass Index Impacts Short, Intermediate, and Long-Term Survival in Lung Transplantation**

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**Purpose:** The effects of extremes of weight are poorly understood in the setting of lung transplant (LTx) with challenges in nutrition, rehabilitation, as well as preexisting co-morbidities. We sought to assess the impact of donor and recipient body mass index (BMI) on short (0-90days), intermediate (91-365 days) and long-term (>365 days) LTx survival.

**Methods:** The United Network for Organ Sharing data registry was queried for first-time recipients of single or double LTx from a cadaveric donor transplanted between 1987-2013 for recipients age 18-80 years at the time of the transplant and had data on recipient and donor BMI categorized as underweight (15.1-18.4 kg/m²), normal weight (18.5-29.9 kg/m²), obese (30-34.9 kg/m²), or morbidly obese (35-40 kg/m²). Short- and intermediate survival was assessed using logistic regression of survival 0-90 days, as compared to >90 days post-transplant; and survival to 365 days, as compared to surviving 91-365 days. Multivariable Cox proportional hazards models adjusted for characteristics of the recipient, donor, and transplant.

**Results:** 22090 LTX recipients met inclusion criteria. Compared to recipients in the normal weight category, underweight recipients had improved short-term survival (OR=1.23, 95% CI=1.07-1.4; p=0.004) and obese recipients worse (OR=0.88, 95%CI=0.78-0.99; p= 0.03). Obese recipients were less likely than normal weight recipients to survive 1 yr (OR=0.84; 95%CI=0.75-0.94; p=0.002). Recipients from obese donors were less likely to survive to 1-yr than recipients of lungs from normal weight donors (OR=0.81; 95%CI=0.71-0.91; p<0.001). Long-term conditional survival analyzed found differences in survival by recipient BMI (p<0.001) & donor BMI categories (p=0.048). Proportional hazards models found that obese recipients had increased mortality hazard compared to normal weight recipients (HR=1.15; 95%CI=1.07-1.23; p<0.001). Multivariate Cox model demonstrated elevated mortality in underweight (HR=1.13; 95%CI=1.01-1.26; p=0.03) and obese recipients (HR=1.14; 95%CI=1.04-1.26; p=0.007).

**Conclusion:** In a population based analysis, BMI heavily influences LTx survival for short, intermediate, & long-term. Underweight recipients may not have the physiologic reserve necessary to obtain optimum results while those with elevated BMI have challenges that may be attributed to their obesity.

**Heart Transplantation From Donors Outside Standard Acceptability Criteria Using Ex-Vivo Normothermic Perfusion: The End of Donor Shortage?**


**Purpose:** Utilization of the organs from high-risk donors may increase the number of orthotopic heart transplants (OHTx), however, with possible detrimental effect on outcomes. The Organ Care System (OCS) (TransMedics, MA, USA) allows organ evaluation during normothermic perfusion and reduces the cold ischemic time below 100 minutes with potential benefit for post-transplant results when transplanting extended criteria allografts. In this study we analyze the results of OHTx from donors outside standard criteria following ex vivo perfusion.

**Methods:** Between February 2013 and September 2014 (n=40) patients underwent heart transplantation at our institution using the OCS as a method of graft preservation and assessment. Fifteen patients received organs from standard criteria donors (group I) and 25 from extended criteria donors (group II) with at least one of the following risk factors; LVEF ≤50%, LV hypertrophy (LVH); interventricular septum in diastole >14 mm, donor cardiac arrest, coronary artery disease or donor death due to cocaine.

**Results:** Donor age: 41±11 (17-59 yo) gender F/M: 22:57.7%. Transport time was ≥2.5 hours in 19 donors. Seven donors had reduced LVEF ≤50%, seven had LVH, two donors died due to cocaine overdoses, ten had a previous cardiac arrest; 30±9 min and six palpable coronary artery disease.

Both groups (standard vs. extended criteria) were statistically comparable regarding recipient characteristics. Ex vivo perfusion parameters; lactate trend, haemodynamic data and ischemic times were also unaffected. No significant differences were observed on postoperative outcome. There was a trend towards less duration of mechanical ventilation in hours in the extended criteria group 56 (21; 125) vs. 100 (41; 336) (p=0.074). At follow up of 268±64 days, biventricular graft function was comparable. 30-days, 90 days and 1-year survival (group I vs. II) was also similar: 92.9 vs 91.8; 84.4 vs. 87.5 and 84.4 vs. 81.6% (log rank p=0.832).

**Conclusion:** Transplantation of hearts from extended criteria donors with moderate left ventricular dysfunction, donor cardiac arrest, left ventricular hypertrophy or coronary artery disease is safe and feasible with normothermic ex vivo preservation as a method of graft assessment pre-implantation and therefore should be considered in times of donor shortage.

**Technique of Adult Heart Procurement in the Donation After Circulatory Death Multi-Organ Retrieval Scenario**

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**Purpose:** We describe our experience and technique of Donation after Circulatory Death (DCD) heart retrieval in the context of the multi-organ procurement process. The recent success of distantly procured DCD heart transplantation makes it imperative to refine the technique for rapid heart retrieval without jeopardizing other organs, particularly the liver given its vulnerability to ischaemia associated with a prolonged donor agonal phase.

**Methods:** 8 DCD hearts were procured under separate research and clinical transplant protocols at St Vincent’s Hospital Sydney, between June 2013 and October 2014. The hearts were retrieved for ex-vivo resuscitation on the TransMedicsTM Organ Care System (OCS). Three of the 4 clinical cases were transplanted successfully.

After confirmation of donor death, a median sternotomy and laparotomy were concurrently performed. The heart and systemic venous system were immediately decompressed by cannulation of the right atrial appendage and rapid collection of blood for priming the OCS followed. The descending thoracic aorta was clamped and purse strings for the cardio and pneumoplegia cannulae placed. Upon completion of blood collection, the inferior vena cava was transected and left atrial appendage incised. Antegrade cardioplegia, consisting of Modified