Do MCS Patients Require Special Donor Consideration?

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AST | AMERICAN SOCIETY OF TRANSPLANTATION

This might be RELATIVE

Or Relative in other Ways !!!

You Are a Heart Transplant Surgeon

OR

Heart Failure Cardiologist

Disclosures

- Consultant to:
  - SynCardia Systems
  - Medtronic
  - Carmat TAH
  - BiVACOR TAH

Additional Disclosures

- A Heart Transplant Surgeon who wants to think
  Like a Heart Failure Cardiologist ?!?!

Did I make the wrong the decision ?

I Hope Not

When is all the SAME

- A Heart Failure Cardiologist who thinks every possible Donor is a good DONOR and every possible recipient listed is a good RECIPIENT !?

- A Transplant Surgeon who wants to demonstrate to the world his/hers Surgical Fortitude !!!!

Is the Transplant at RISK: Recipient with Prior Cardiac Surgery

- **13 recipient-related variables:**

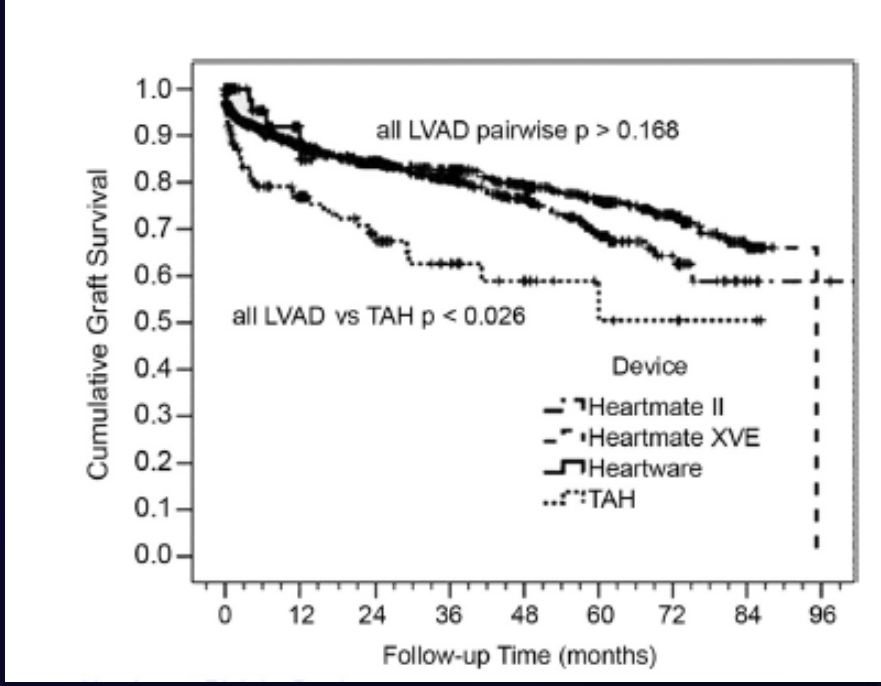
  age > 50 years, female sex, history of cancer, pulmonary disease, valvular cardiomyopathy, or congenital, heart disease, ***previous cardiac surgery***, hypertension, diabetes, mechanical ventilation, ascites or chronic bilateral lower limb edema, GFR, total bilirubin, AST

- Can we mitigate this RISK?

Jasseron C et al. Optimization of heart allocation: The transplant risk score. Am J Transplant 2019;19:1507-1517

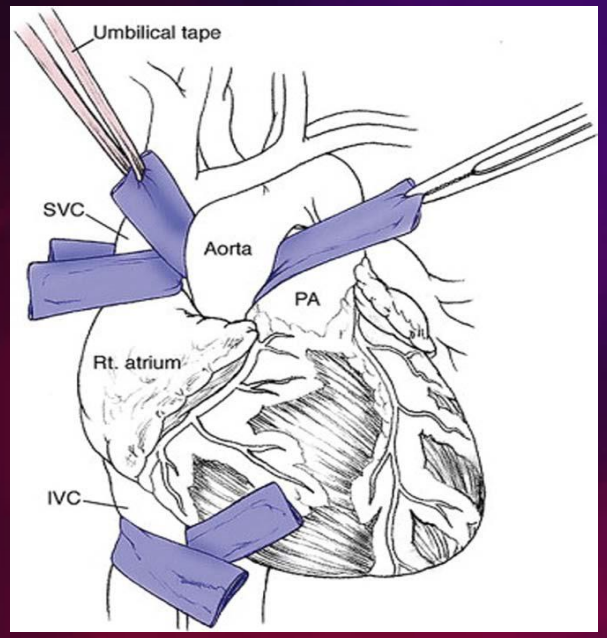
Is the Transplant at RISK: Because the type of MCS/Technique

- Not sure
  - Lateral Thoracotomy Trial
  - Type of Device?
    - Decreased donor age, low recipient PVR, short ischemic times, gender match, and higher BMI ratio are associated with improved graft survival.
  - Was the MCS-Patient Protected?



Maltais S et al. Mechanical Circulatory Support and Heart Transplantation: Donor and recipient factors influencing graft survival. Ann Thorac Surg. 2013;96:1252-8

What is MCS Protection?



Ihnken K et al. Surgical Technique to facilitate explantation of MCS: LVADs, BiVADs and TAHs before hear transplantation. ASAIO J 2016;62:211-213

Its not only the RECIPIENT, is the DONOR too

Recipient Factors	Hazard Ratio	*p* Value	Score
Mechanical circulatory support			
Noncontinuous-flow ventricular assist device	1.27	0.007	2

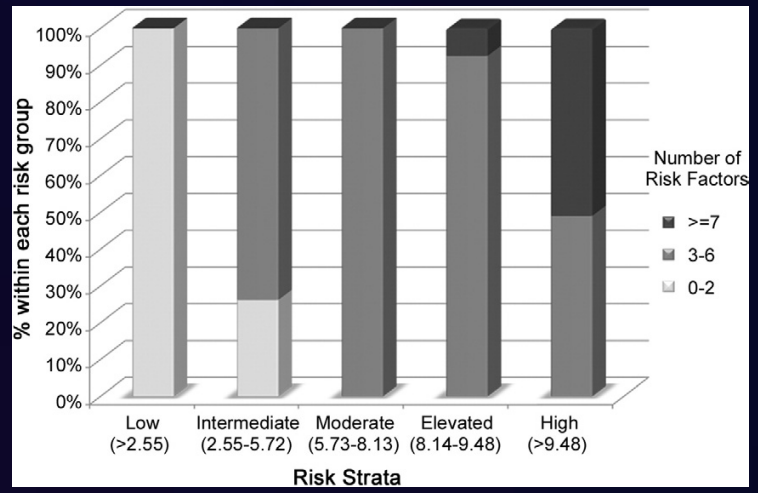
Donor Factors	Hazard Ratio	*p* Value	Score
Donor age (years)			
50–55	1.23	<0.0001	1
>55			2
Ischemia time >4 hours	1.13	<0.0001	2
Gender mismatch	1.07	0.002	1
Diabetes	1.22	0.02	1
Total donor allowed			6

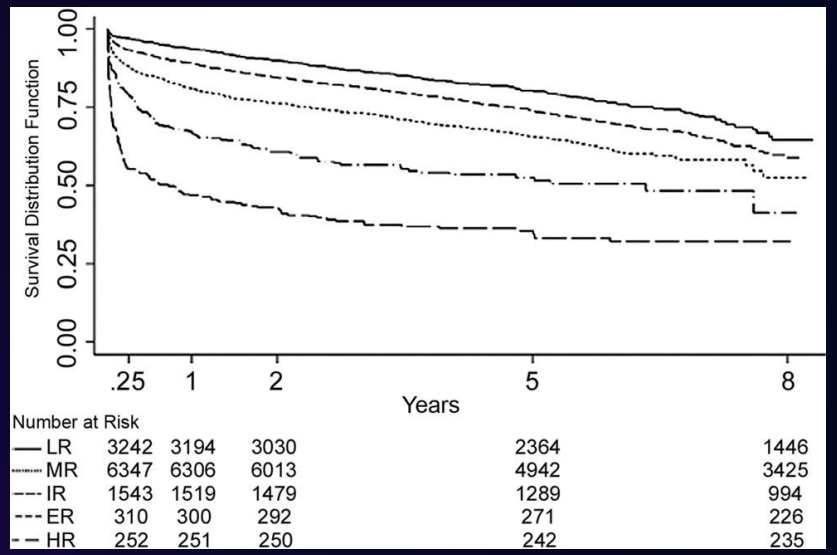
- When the high-risk and very high-risk recipients received organs from high-risk donors, their 1 year survival was 83 and 62%, respectively, and 5 year survival was 65 and 49%, respectively.

- Trivedi JR et al. Heart Transplant Survival Based on Recipient and Donor Risk Scoring: A UNOS Database Analysis. ASAIO J 2016;62:297-301

What are the Risk factors?

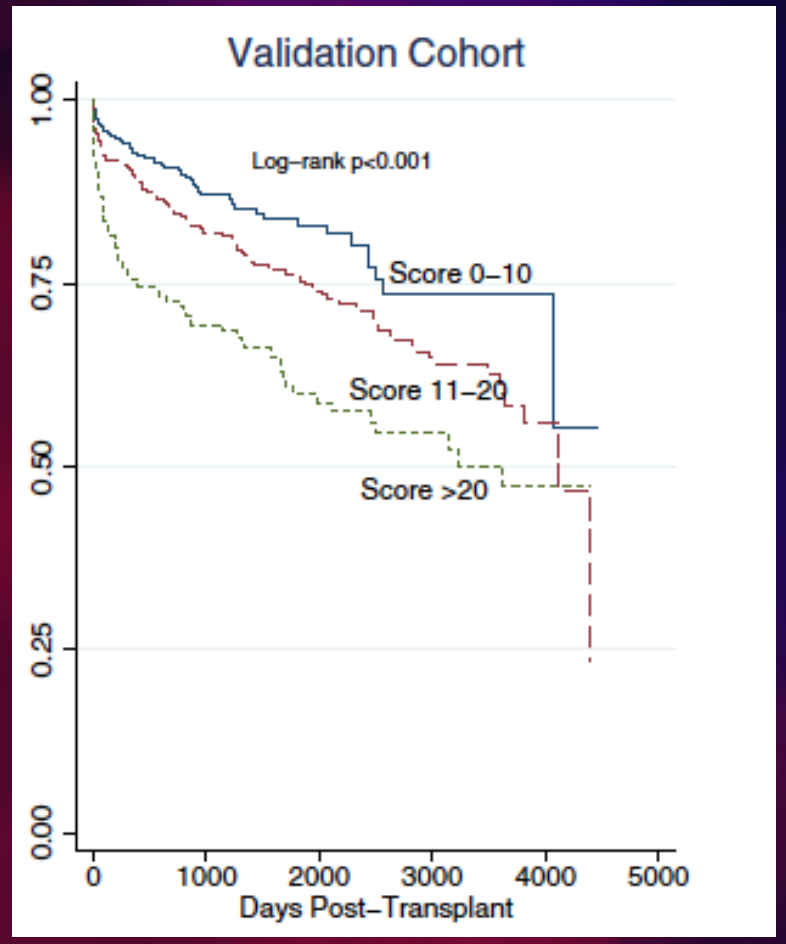
- Recipient Risk Factors:
  - Poor Renal Function
  - Poor Liver Function
  - Advanced age
  - Congenital Etiology
  - Amyloidosis
  - RVAD, ECMO, Exc VAD, TAH
- Donor Risk Factors
  - Insulin dependent DM
  - Advanced Donor Age
  - Prolonged Ischemic time
  - Female Gender
  - Hep C





Hong KN et al. Who is the High-Risk Recipient? Predicting Mortality After Heart Transplant Using Pretransplant Donor and Recipient Risk Factors. Ann Thorac Surg 2011;92:520-7

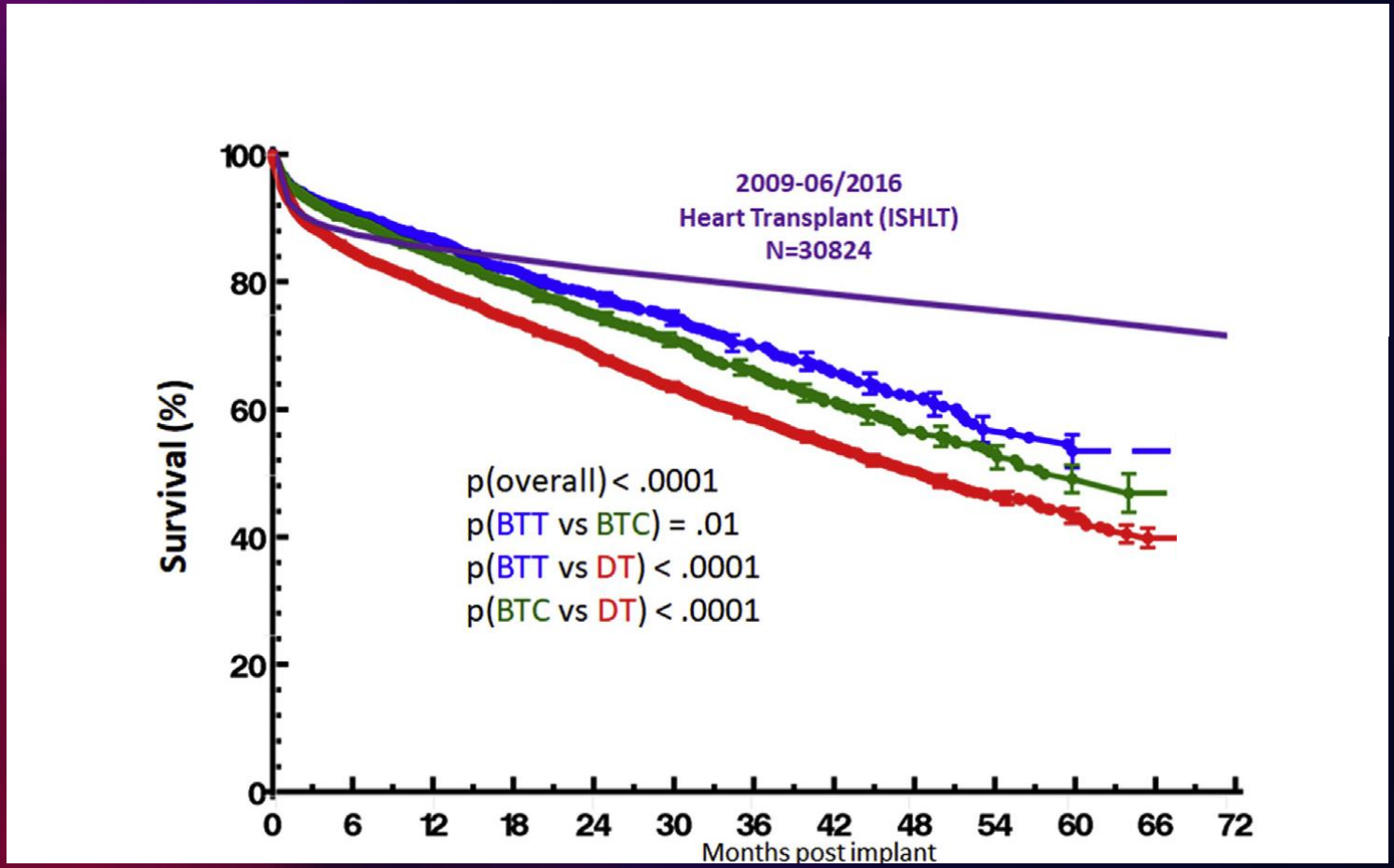
TRIP-MCS



Recipient Variables	Points Allocated
Age > 60	7
BMI <25, 25-34	5
BMI ≥ 35	10
Total Bili > 1.0	5
Est. GFR < 50	10
Dialysis	6
Ventilator	10
ICU	3
Recently treated for Infection	4
LVAD	-
Non-LVAD	3
Donor Variables	
Age > 40	3
Gender mismatch	4
Ischemic Time > 4 hours	5
Est GFR < 50	5

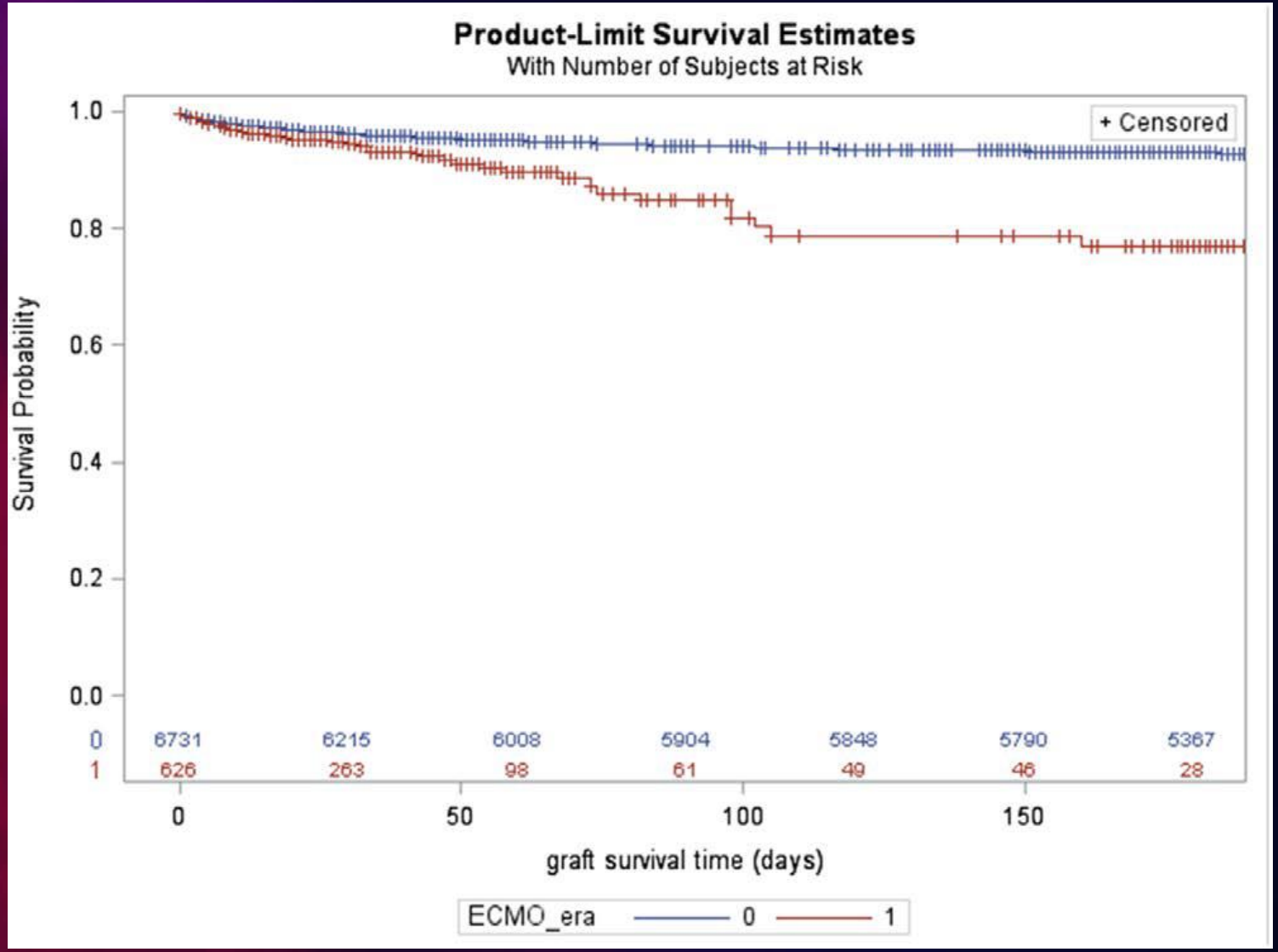
Johnson LE et al. Development of a Transplant Risk Index in patients with MCS. JACC-Heart Failure 2016 4;4:277-86

Transplant vs. MCS Outcomes



Teuteberg JJ et al. The Society of Thoracic Surgeons Intermacs 2019 Annual Report: The Changing Landscapes of Devices and Indications. Ann Thorac Surg 2020;109:649-60

Where are we now? Was this Predictable?



Trivedi JR, Salughter MS. "Unintended" Consequences of Changes in Heart Transplant Allocation Policy: Impact on Practice Patterns. ASAIO Journal 2020 Editorial

In Summary

- Significant amount of literature describing the importance to match donor to recipient, MCS
- What to do NEXT?

What To Do

- Transplant has the best outcome
  - Maybe match new philosophy with New Donor Allocation Policy?
- If MCS has to be utilize
  - Choose Device Appropriately
- Mitigate Recipient and Donor Risk Factors
- If MCS, protect recipient by protecting the MCS !!!