First marginal heart transplantation utilizing organ care system in Asia

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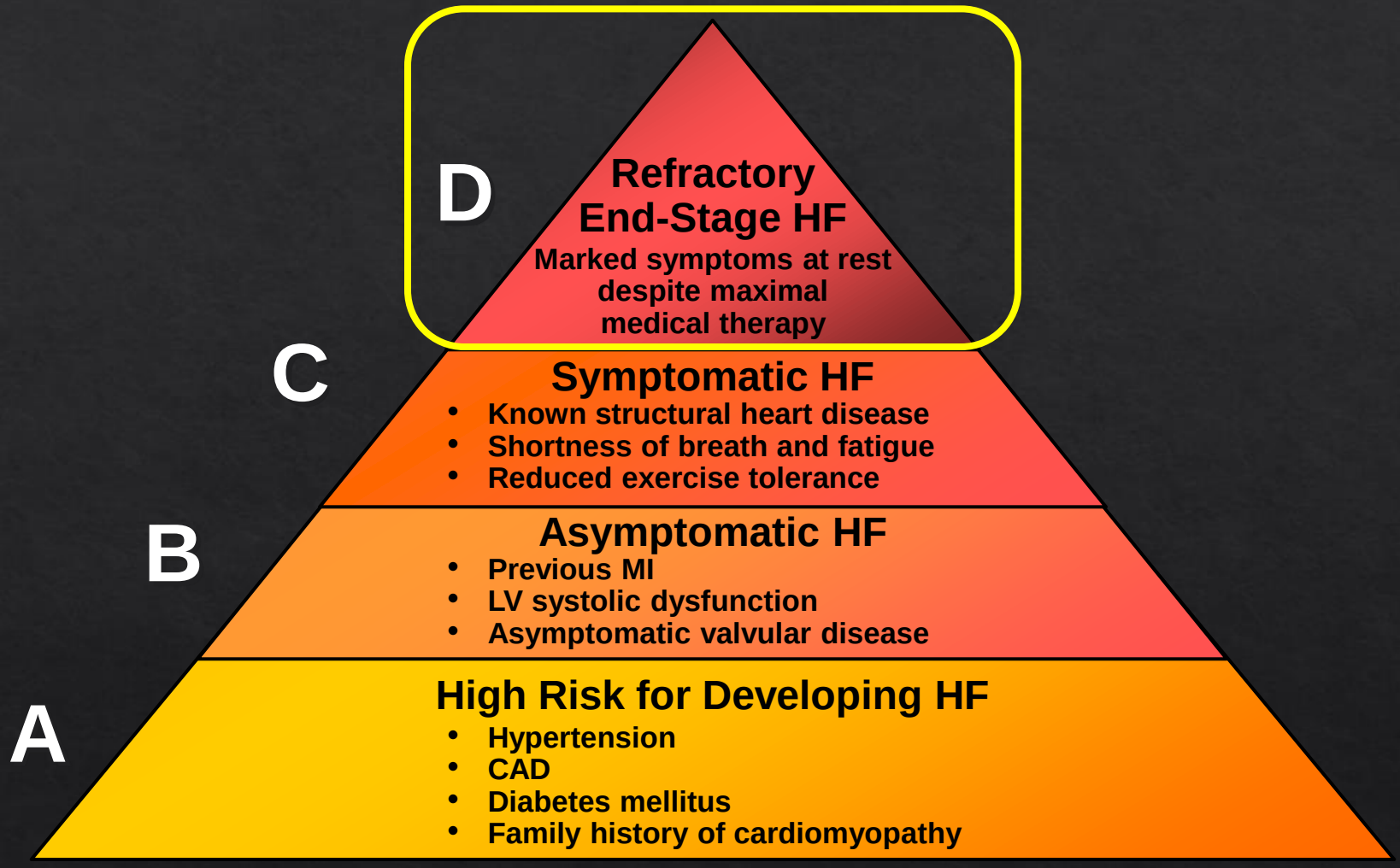
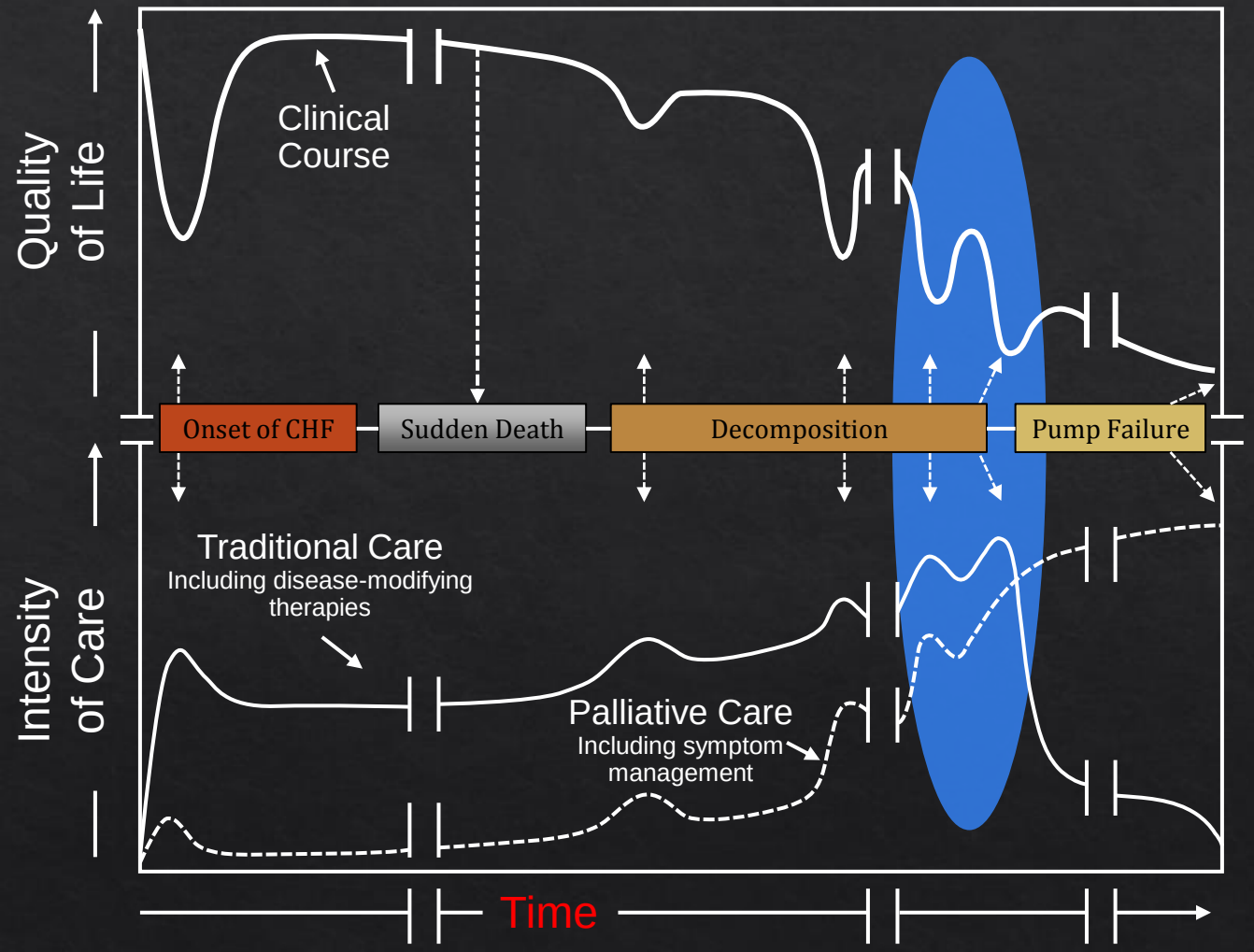
ACC/AHA Practice Guidelines

Pyramid Approach to HF Stages



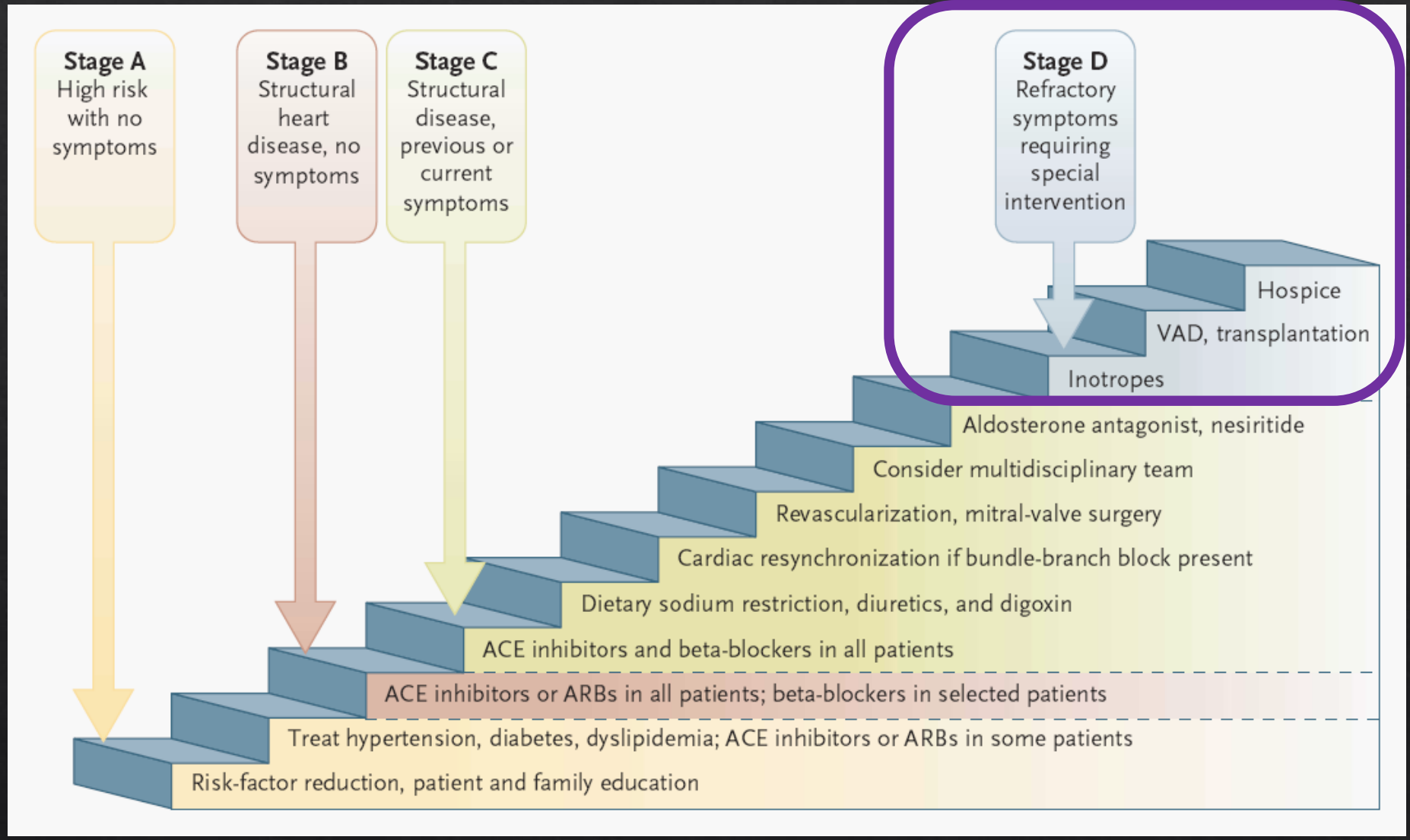
Hunt SA et al: J Am Coll Cardiol 38:2101, 2001

Natural Course of Heart Failure



Allen et al: Circulation 125:1928, 2012

The Traditional HF Treatment Model

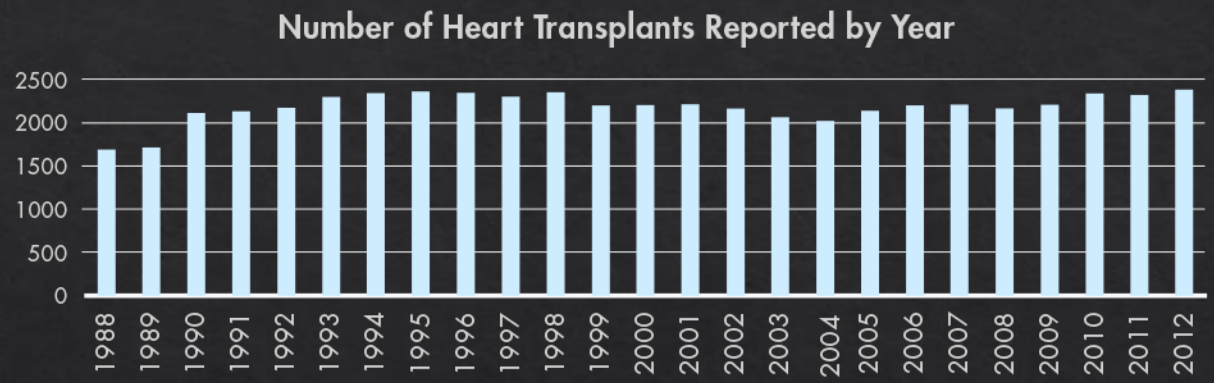


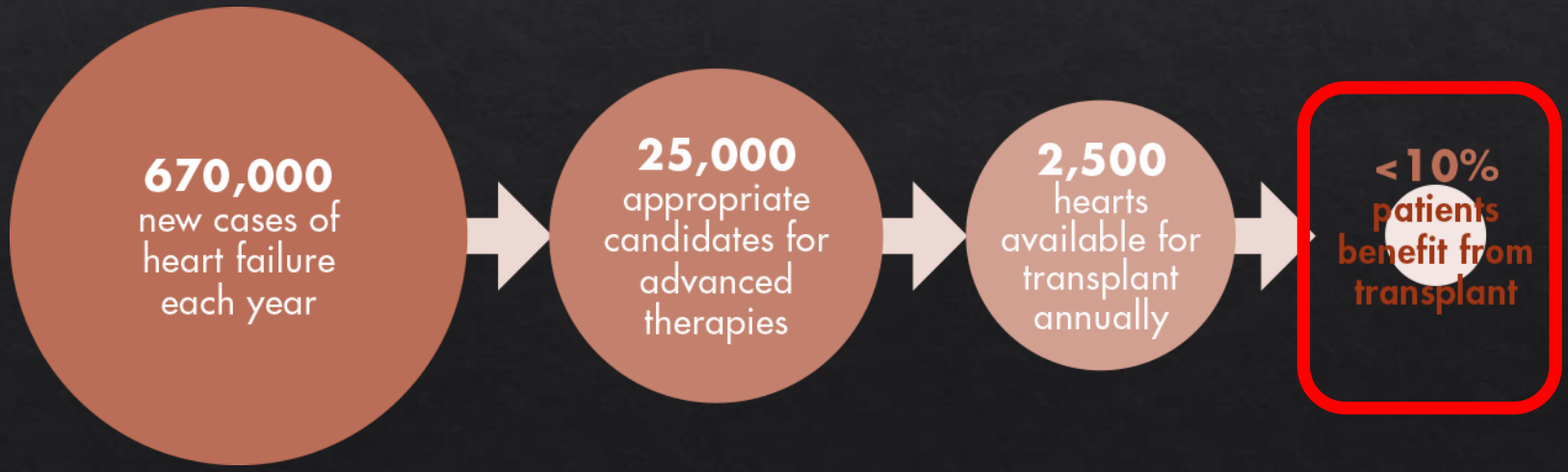
Jessup et al, N Engl J Med. 2003 May 15;348(20):2007-18

Transplants are considered the 'gold standard,' but the supply of donor hearts is limited

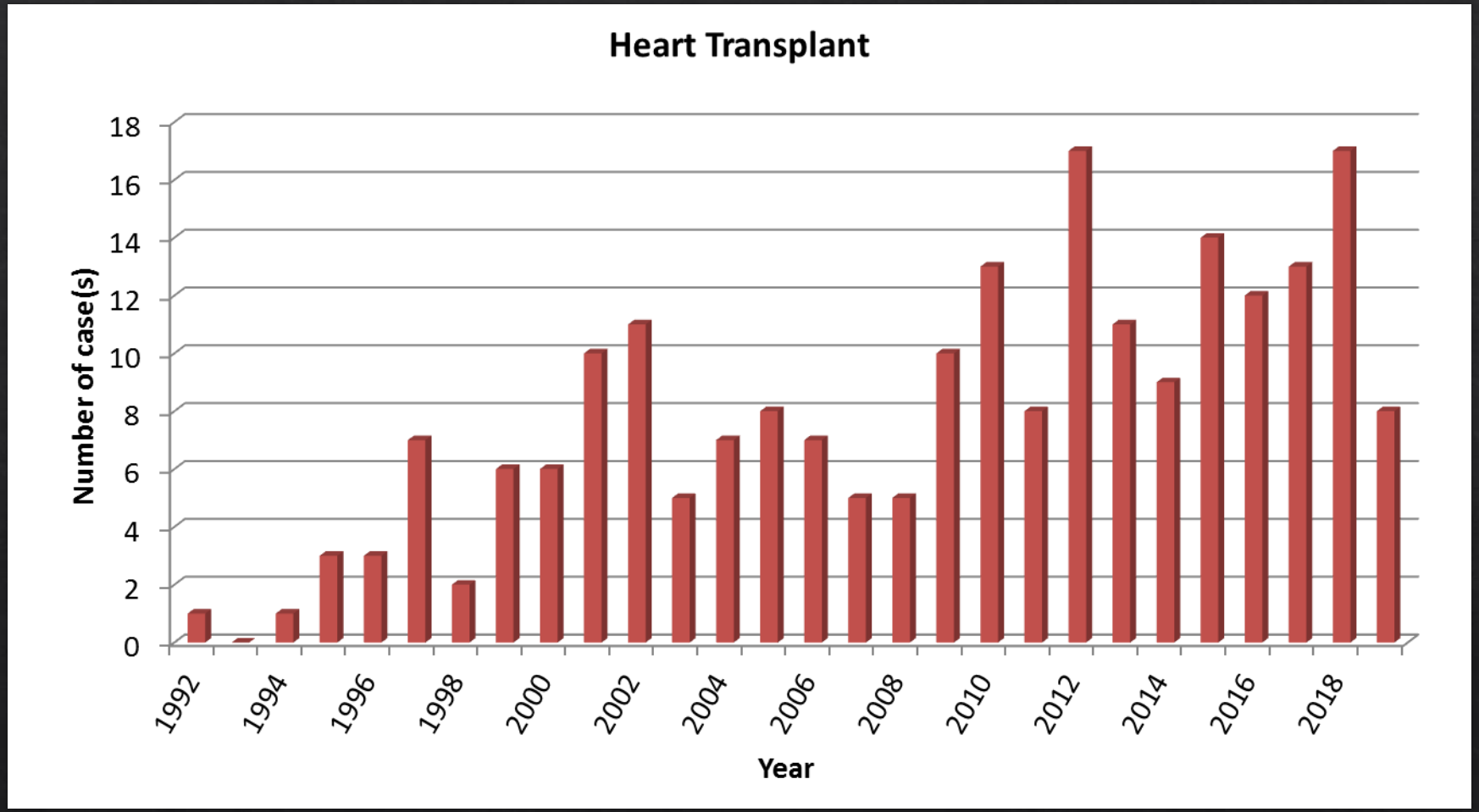
"Proposing heart transplantation to cure heart failure is analogous to proposing the lottery to cure poverty."

– LW Stevenson

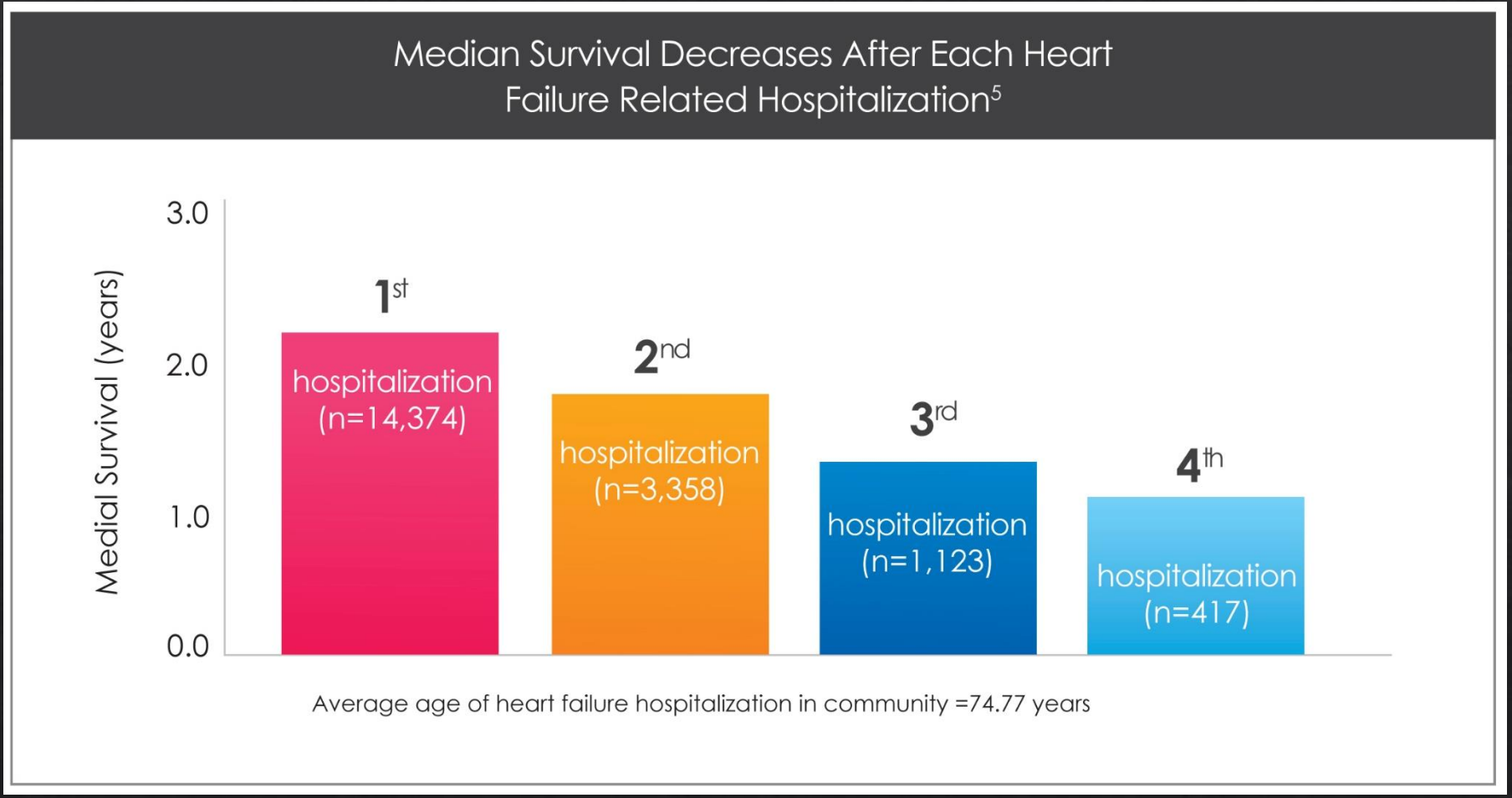




Heart Transplant per year



Hospitalization and Survival



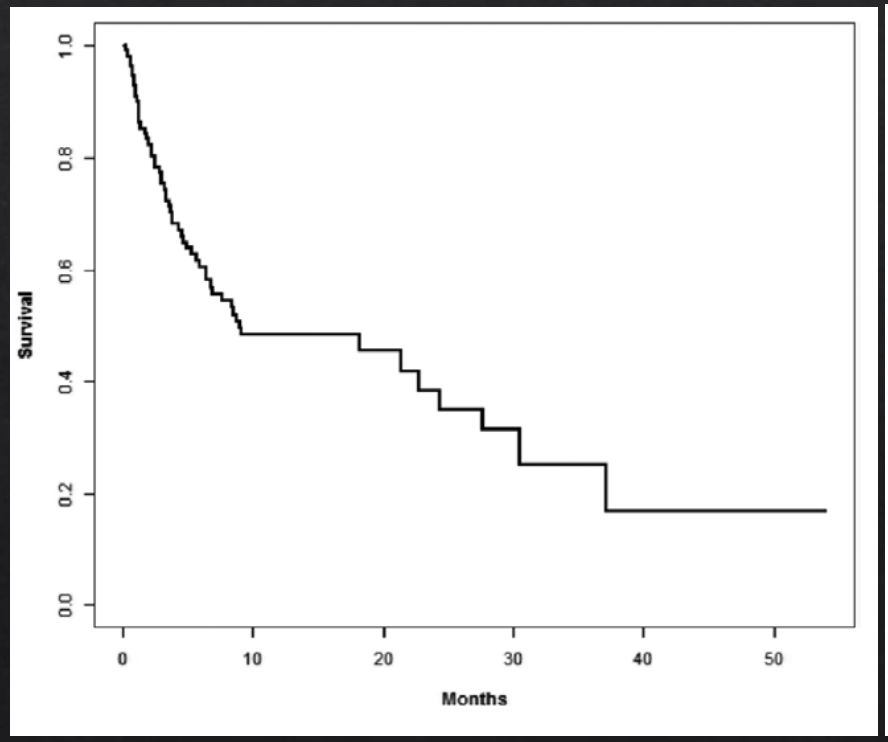
[5] Miller L, Guglin M. Patient selection for ventricular assist devices: A moving target. J Am Coll Cardiol. 2013;61:1209-21.

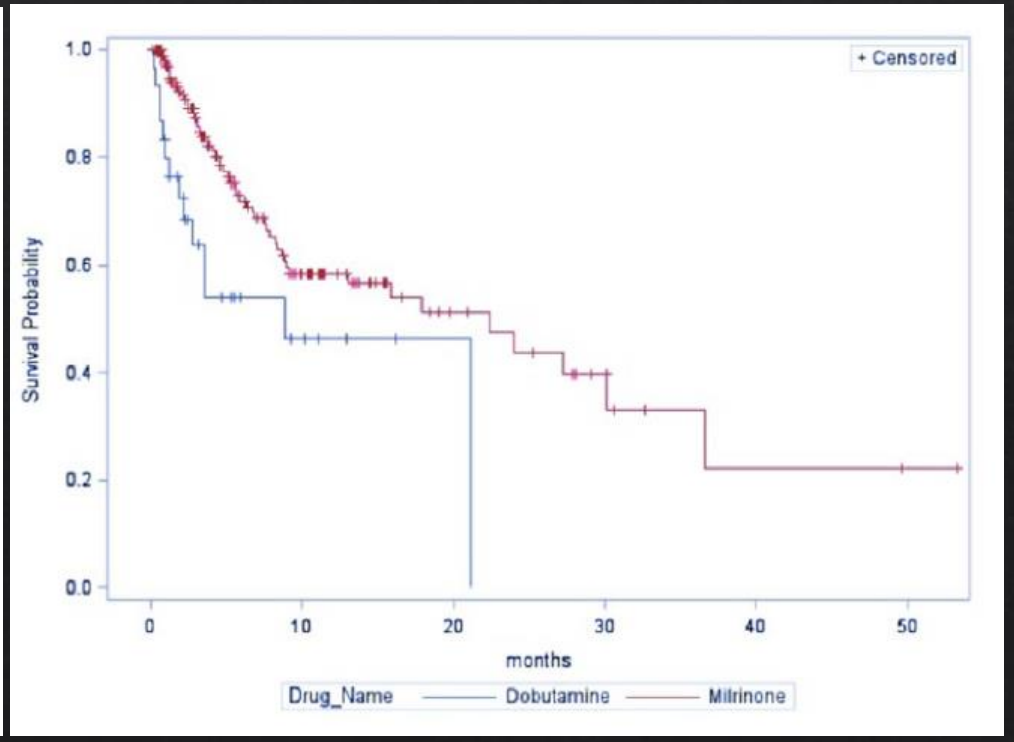
Original Article

Clinical Characteristics and Outcomes of Intravenous Inotropic Therapy in Advanced Heart Failure

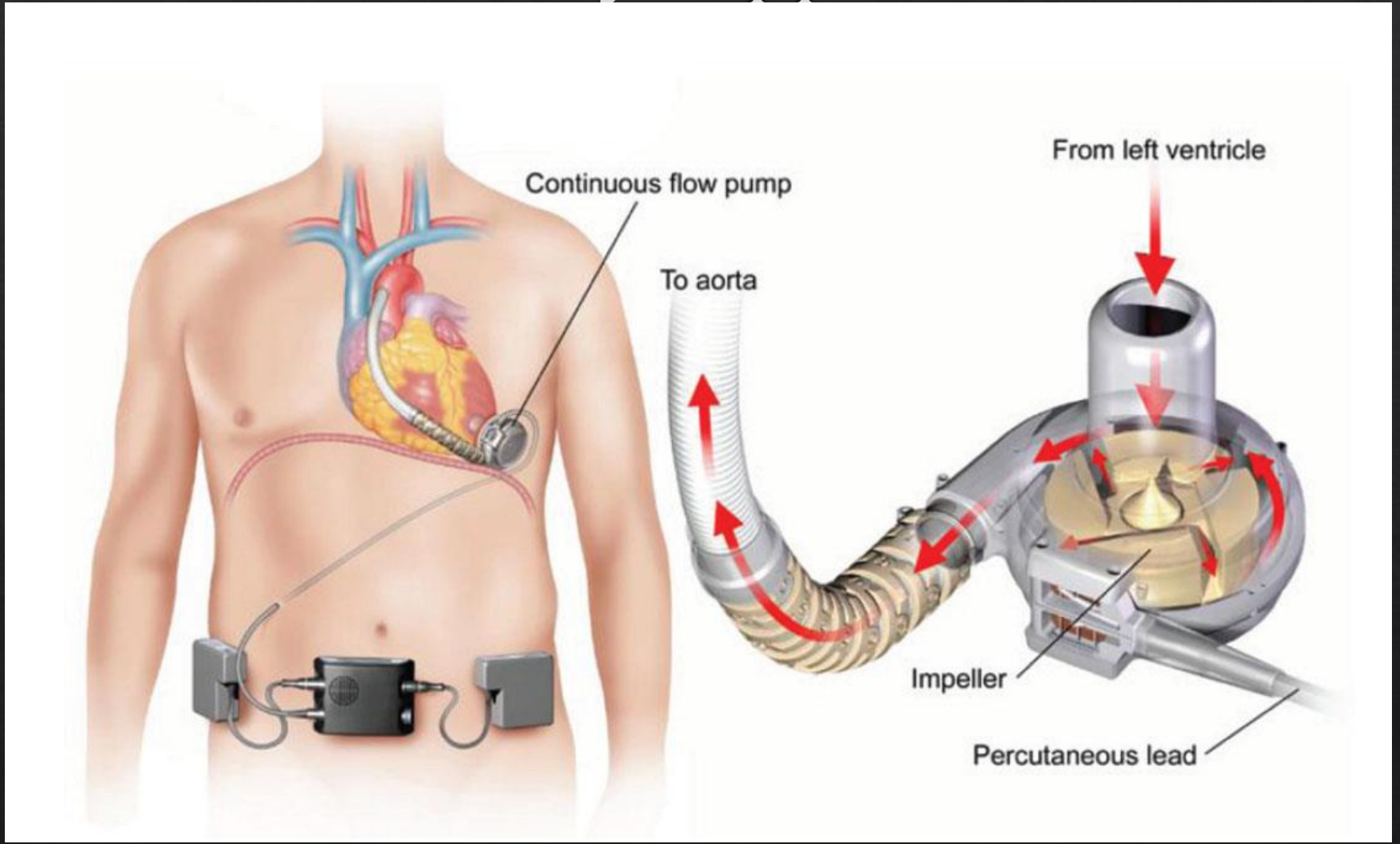
Taimoor Hashim, MD; Kumar Sanam, MD; Marina Revilla-Martinez, MD;
Charity J. Morgan, PhD; Jose A. Tallaj, MD; Salpy V. Pamboukian, MD, MSPH;
Renzo Y. Loyaga-Rendon, MD, PhD; James F. George, PhD; Deepak Acharya, MD, MSPH

< 50% 1-year survival on inotrope





LVAD – only support left side



Aaronson KD et al. *Circulation 2012;125:3191-200*.

Case

- F/54
- Hx of breast cancer received chemotherapy and radiation therapy >9-years ago
- Regular FU with no evidence of recurrence
- Dilated cardiomyopathy for 4 years FU by local hospital on medical anti-heart failure therapy.
- ADHF with ventricular tachycardia.
- Echocardiogram → severe biventricular dysfunction with severe MR/TR LVEF ~ 10-15%.

Case

- Urgent referral to heart transplant service
- Low cardiac output state with poor appetite, nausea, vomiting, cold periphery, lactic acidosis and multiorgan dysfunction.
- Stabilized on double inotropic support end organ function normalised
- Cardiac cath normal coronary arteries
  - BP 95/57 mmHg
  - PA 33/19, 25 mmHg
  - RA 17 mmHg PCWP 21 mmHg
  - Very low cardiac output and cardiac index of 1.43 L/min and 1.03 L/min/m2 despite inotropic support.
- LVAD not suitable due to biventricular failure
- High priority on heart transplant list with double inotropic support

Donor

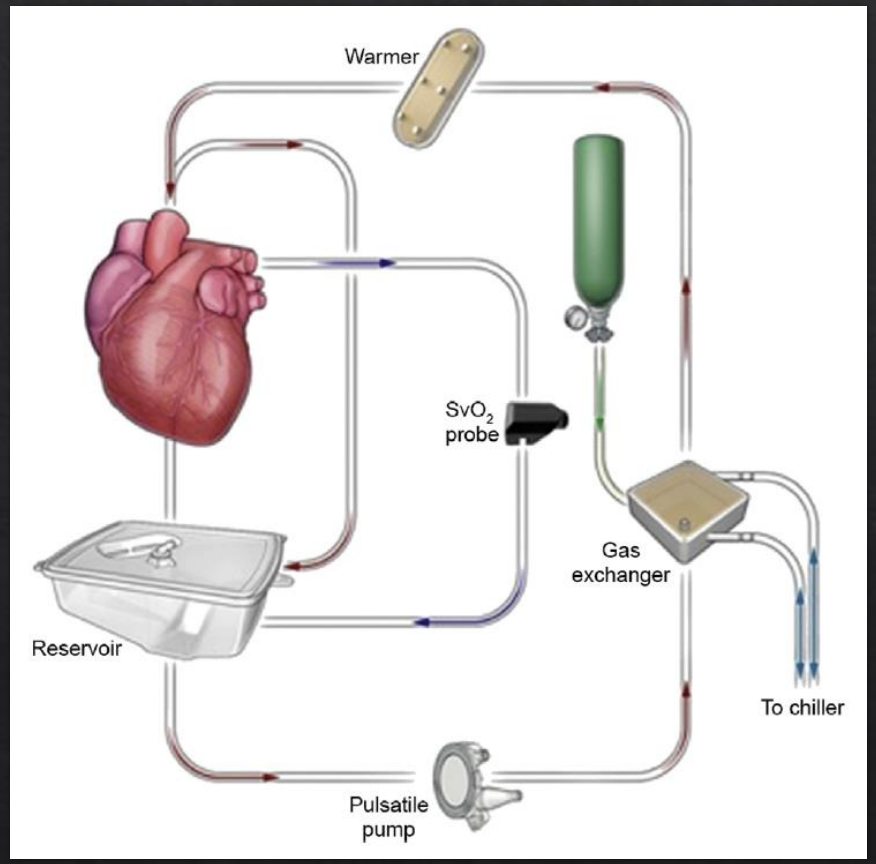
- 65 years old
- On noradrenaline ~ 0.09mcg/kg/min
- LVEF 60%
- Coro → large dominant RCA with 70% stenosis over distal right coronary artery before bifurcation to large posterior descending artery and large posterolateral branches

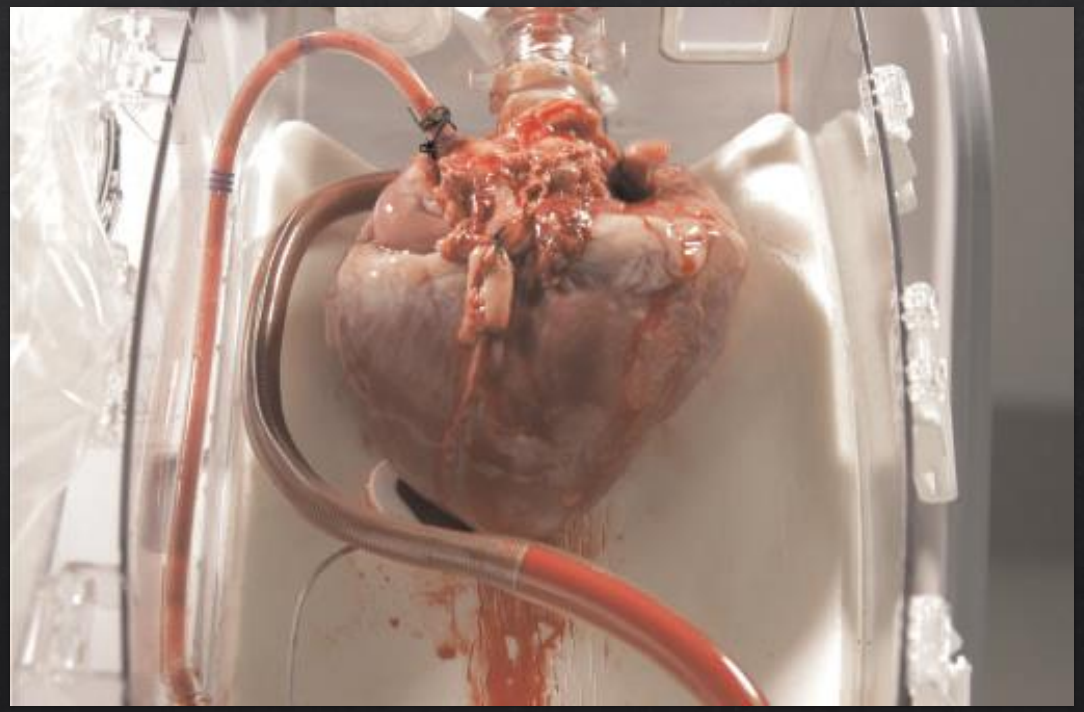
Marginal Heart Donor

- Age between 55 and 65
- Reduced LVEF > 30 and <50%
- Significant but not detrimental catecholamine support
- Moderate LV hypertrophy (>13 and <17 mm)
- Previous donor cardiac arrest
- Prolonged predicted ischemic time (> 4 hours)
- Alcohol/substance abuse
- Coronary one-vessel disease, and/or unknown coronary artery disease status because of a lack of coronary angiography

The Annals of thoracic surgery 2014;98:2099-105
European journal of cardio-thoracic surgery 2016;49:1318-20
Circulation 2002;106:836-41
Transplant international 2008;21:113-25
The Journal of heart and lung transplantation 2010;29:914-56

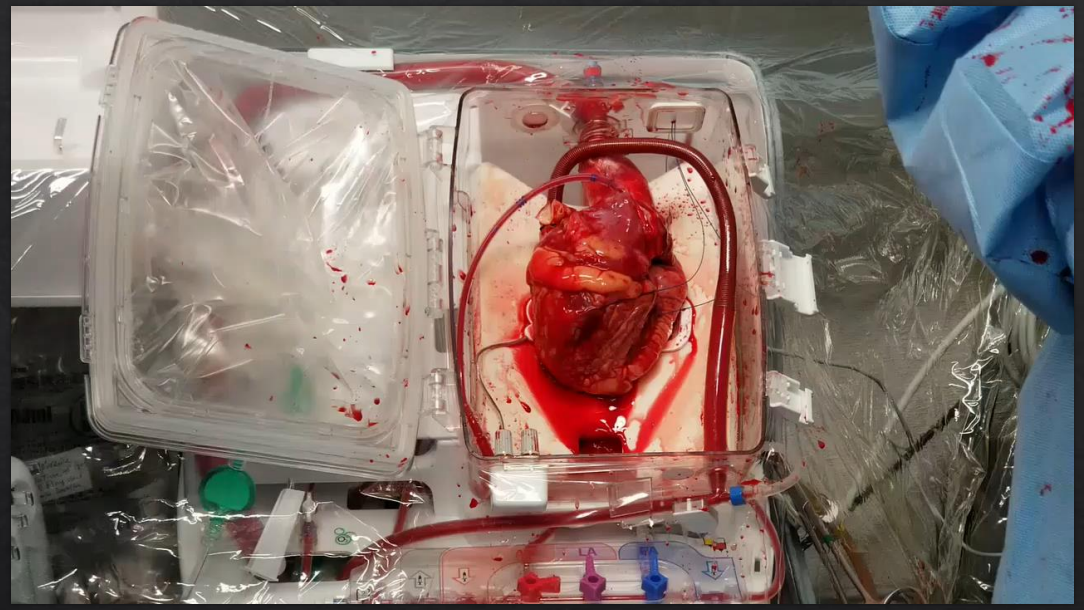
Organ Care System

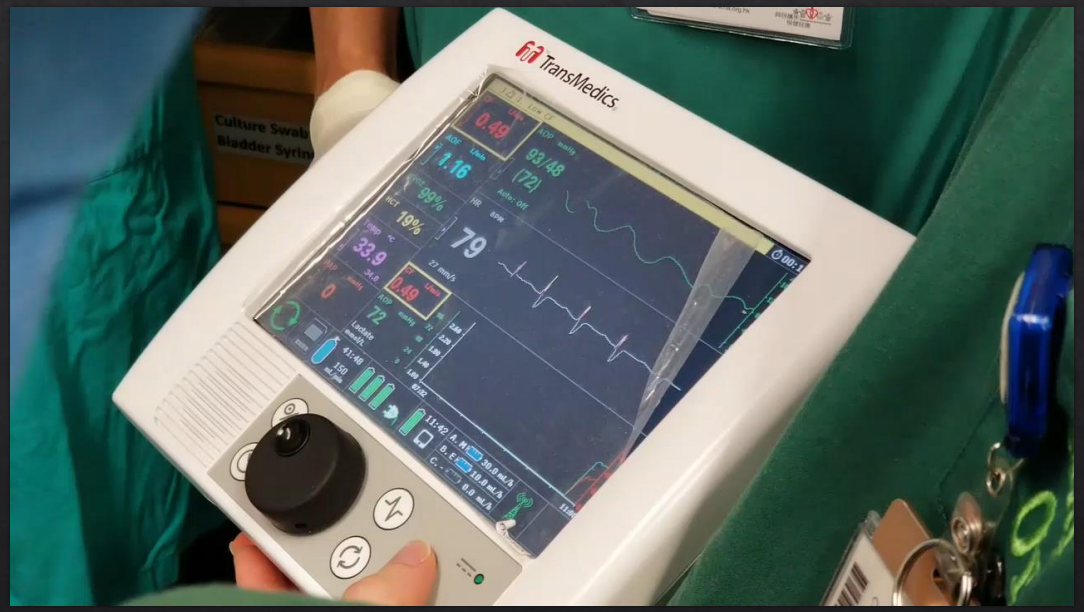




European Journal of Cardio-Thoracic Surgery 55 (2019) i38–i48
Ann Thorac Surg. 2014 Dec;98(6):2099-105

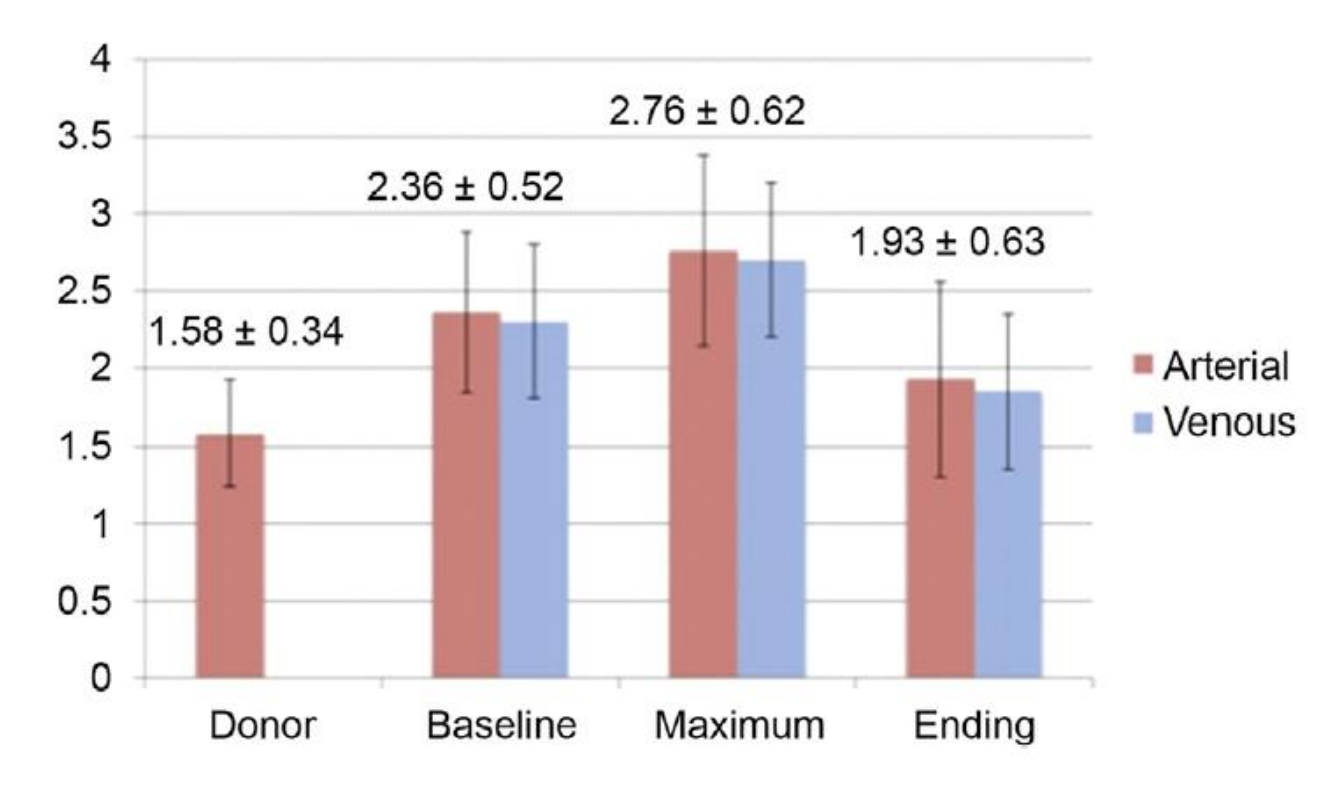
Direct Visual Assessment





OCS Metabolic Assessment

- Use of the OCS is associated with markedly improved short-term outcomes and transplant activity by allowing use of organs previously not considered suitable for transplantation or selection of higher risk recipients, or both

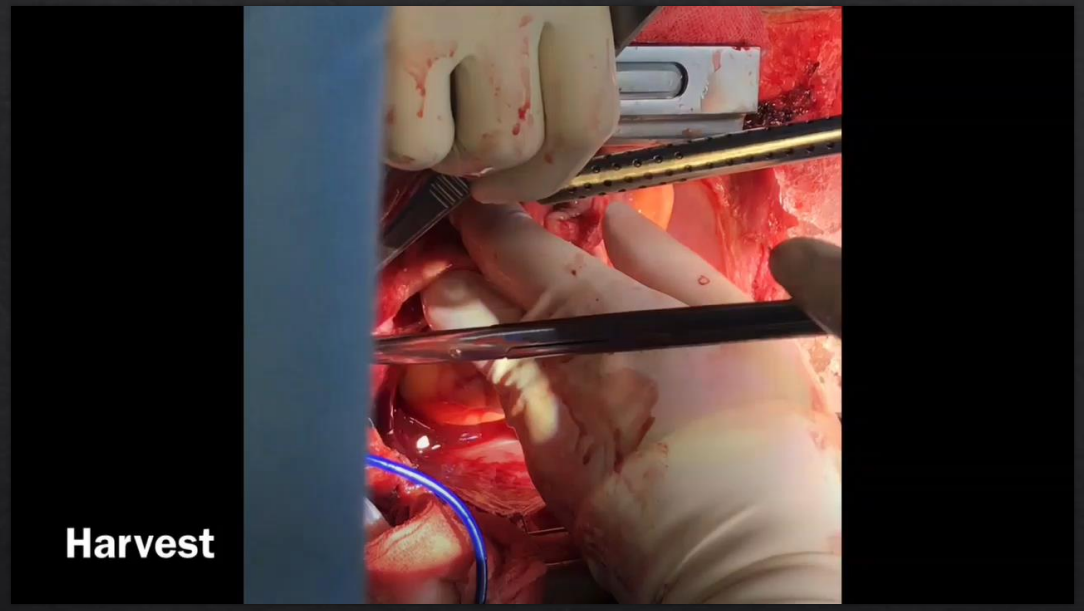


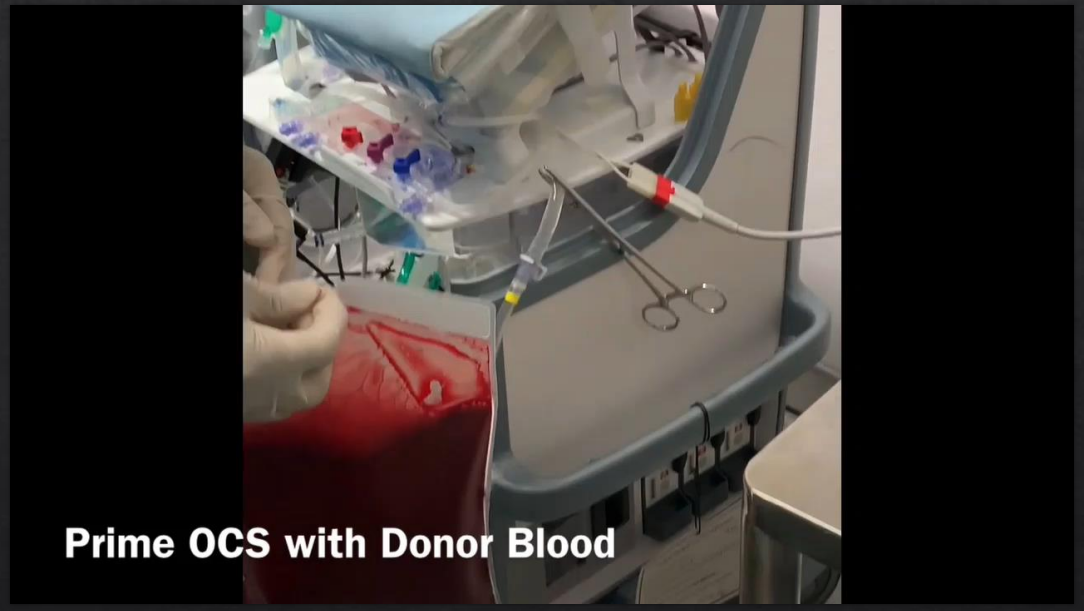
Ann Thorac Surg. 2014 Dec;98(6):2099-105

OCS Setup

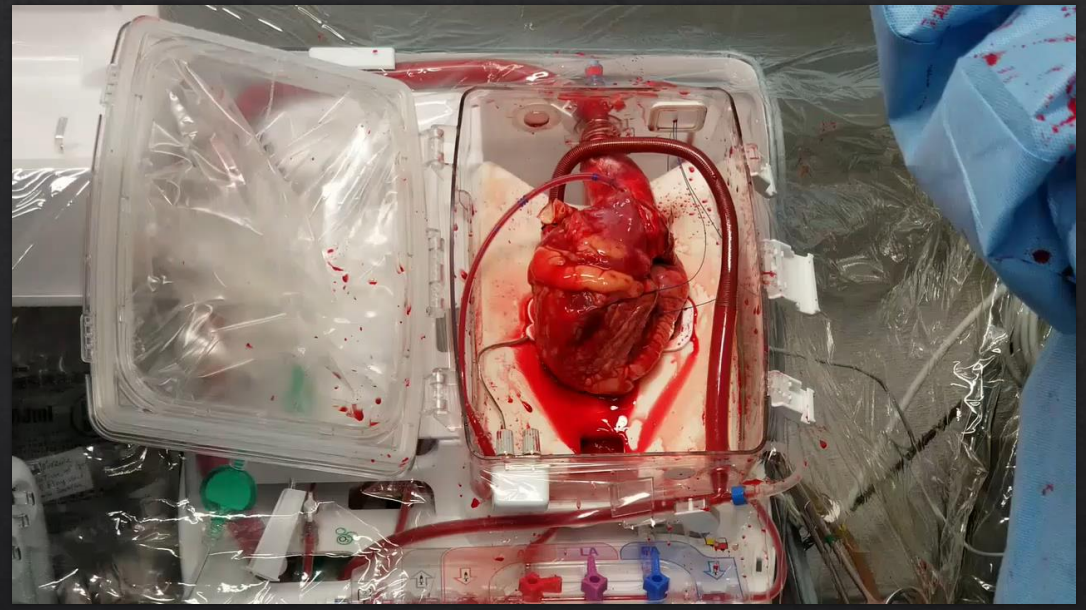
Donor Blood Collection

Donor Graft harvest and OCS Priming



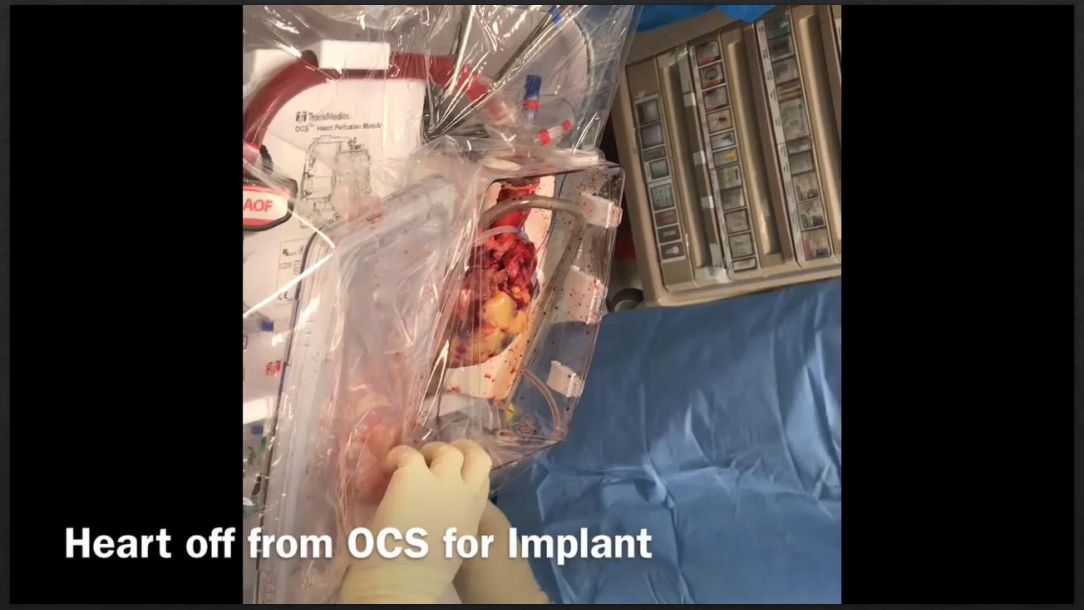


Donor graft on OCS



OCS on Ambulance Transport

Heart off OCS for implant

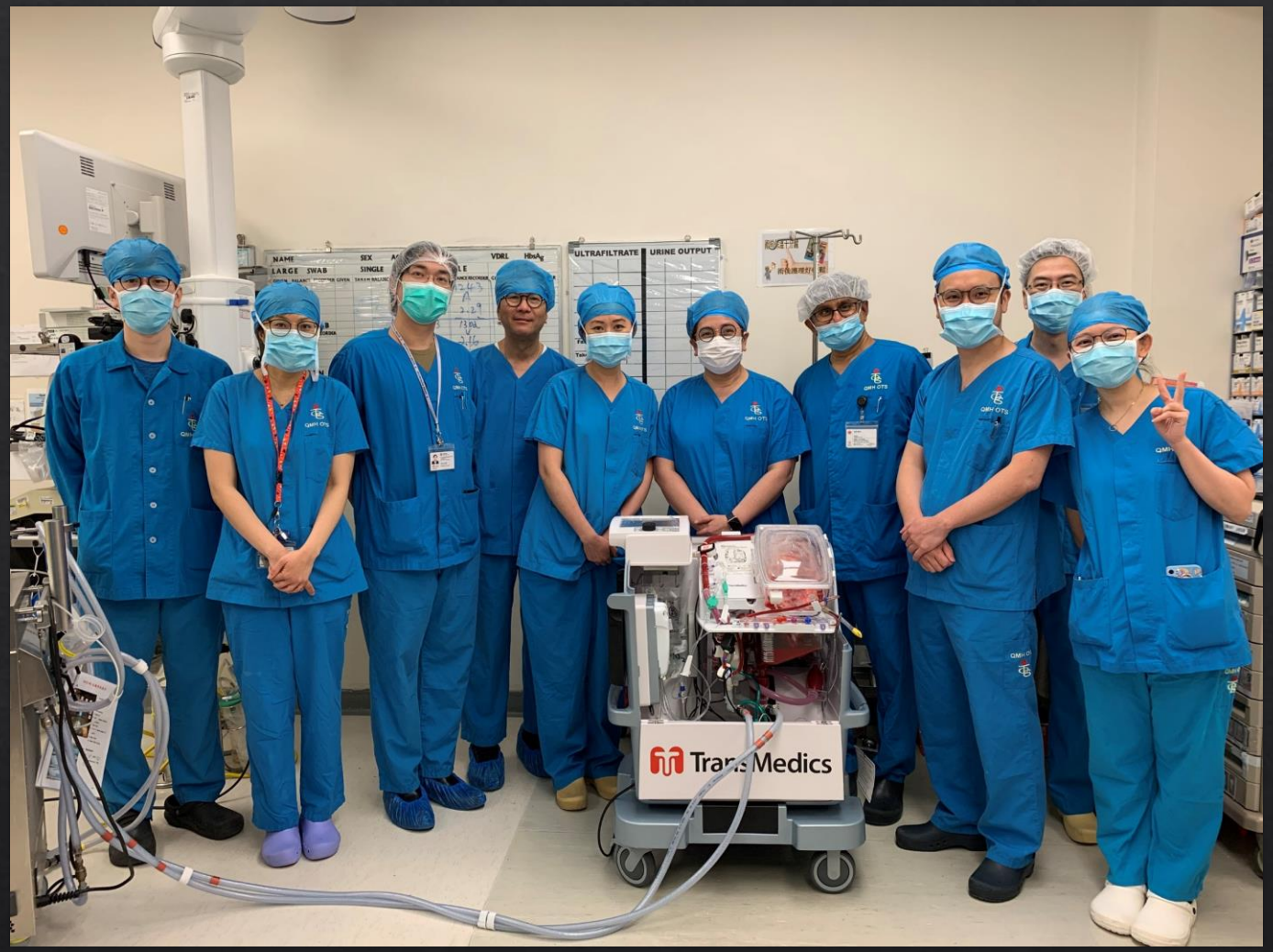


Outcome

- Heart Transplant + CABG done uneventfully
- Very good postop recovery
- Discharged and remained in good clinical condition

Beneficial Role of OCS

- Direct visual assessment of graft function
- Metabolic assessment of graft function
- Limit cool ischemic time
- Increase chance of utilization of marginal donor
- Utilization of deceased donor from circulatory death



On behalf of Transplant Team

Thank you!