

# Advanced diabetic ischemic cardiomyopathy and heart transplant : Indian perspective

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# Indian Insights

- **5 registries on HF in India**

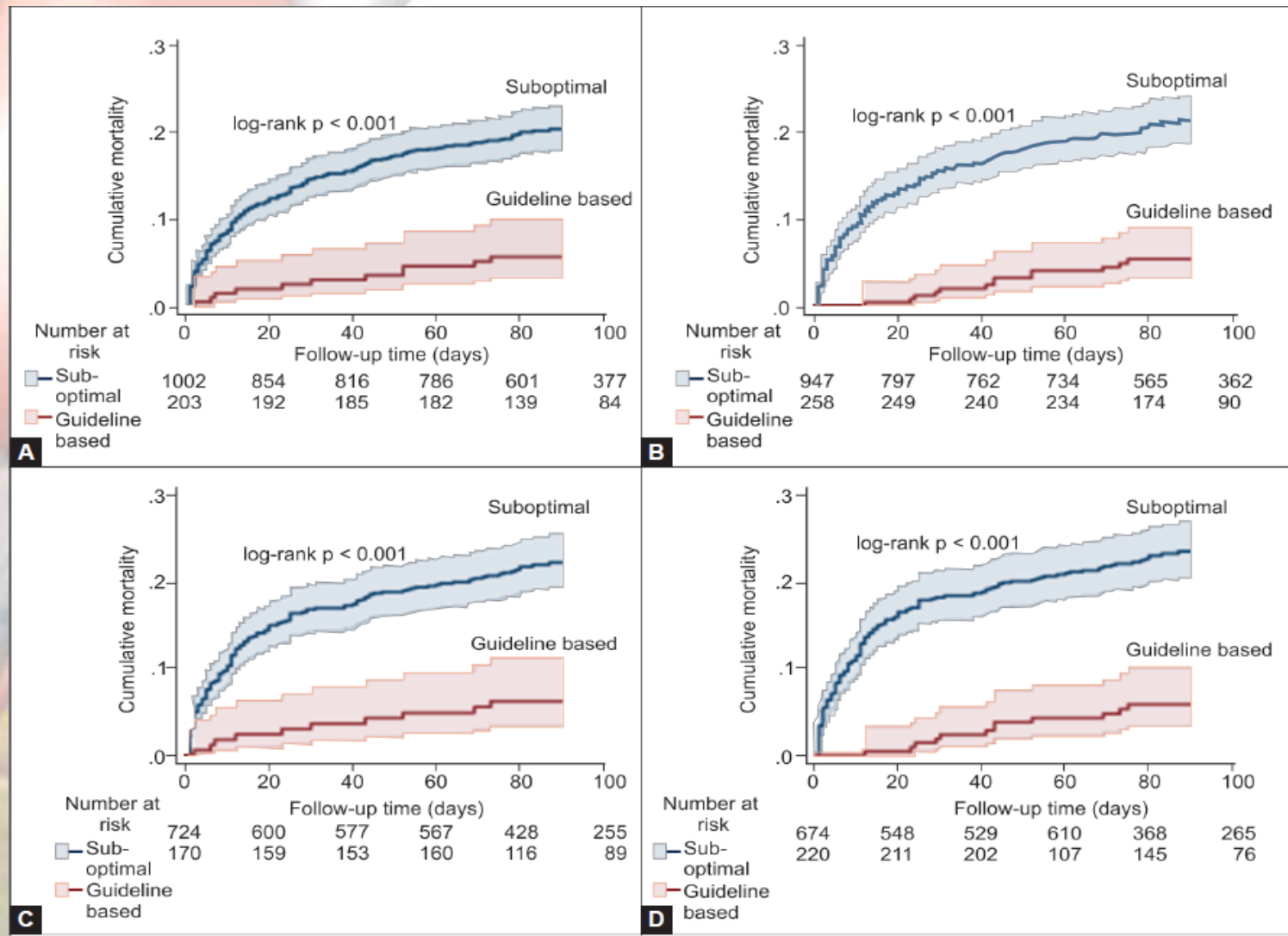
1. The Trivandrum Heart Failure
2. The Asian Sudden Cardiac Death in Heart Failure- Indian Subset data
3. Practice innovation and Clinical Excellence ( Pinnacle) Indian Quality improvement program
4. International Congestive heart failure- Indian Patient data
5. Medanta Registry

## **2 Societies**

- 1 Heart failure society of India
- 2 Indian society for heart & Lung Transplant

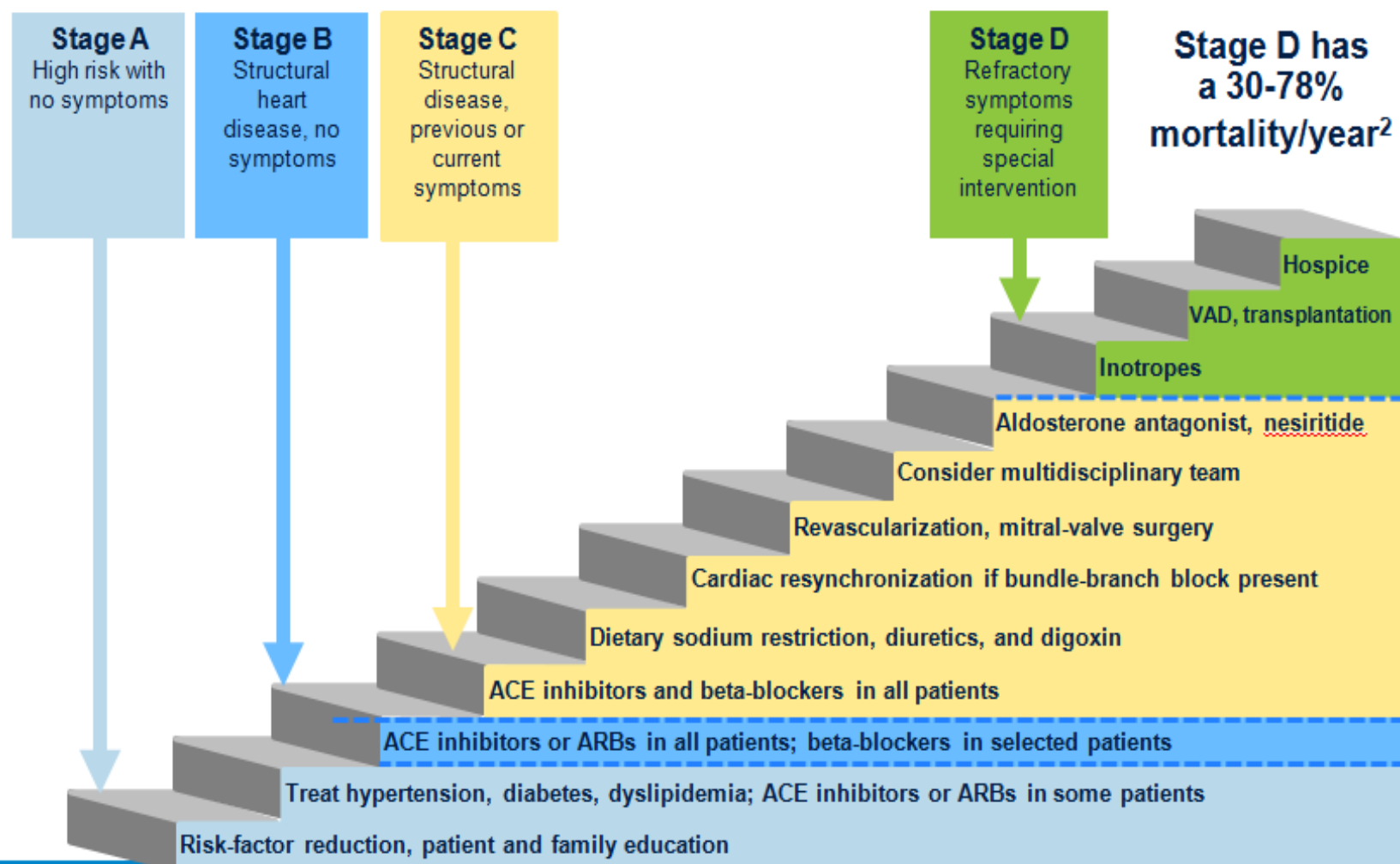
# Trivendram heart registry-outcomes (need for HF clinic)

In Barshi the consulting cardiologist and training practitioner is the heart failure clinic

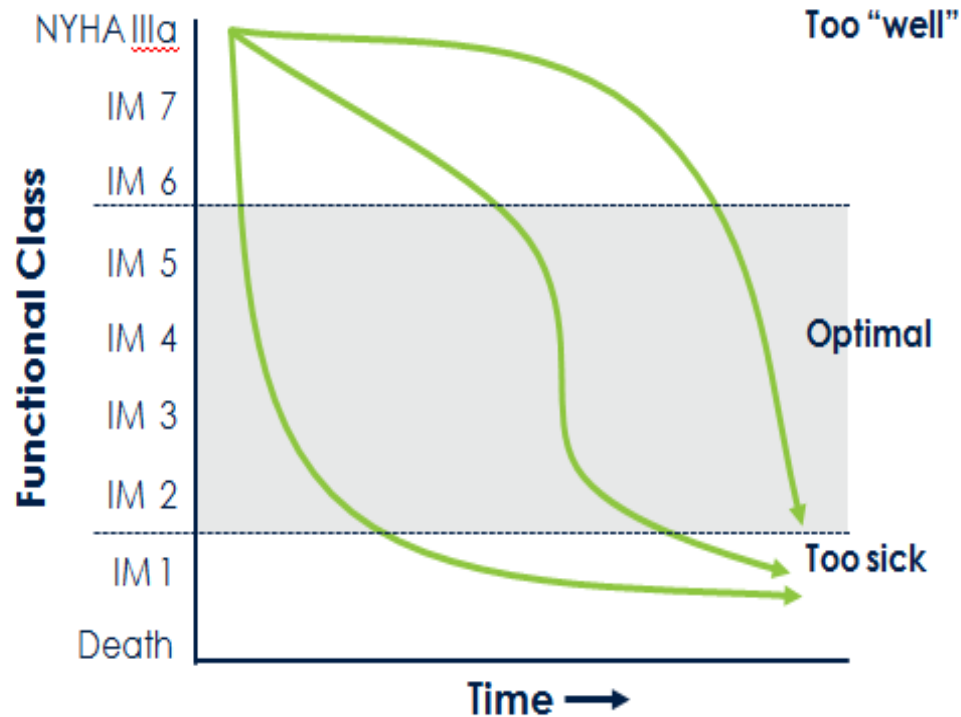


# DEFINING THE PROGRESSION OF HEART FAILURE

## Heart Failure Treatment Algorithm<sup>1</sup>



# Timing of referral

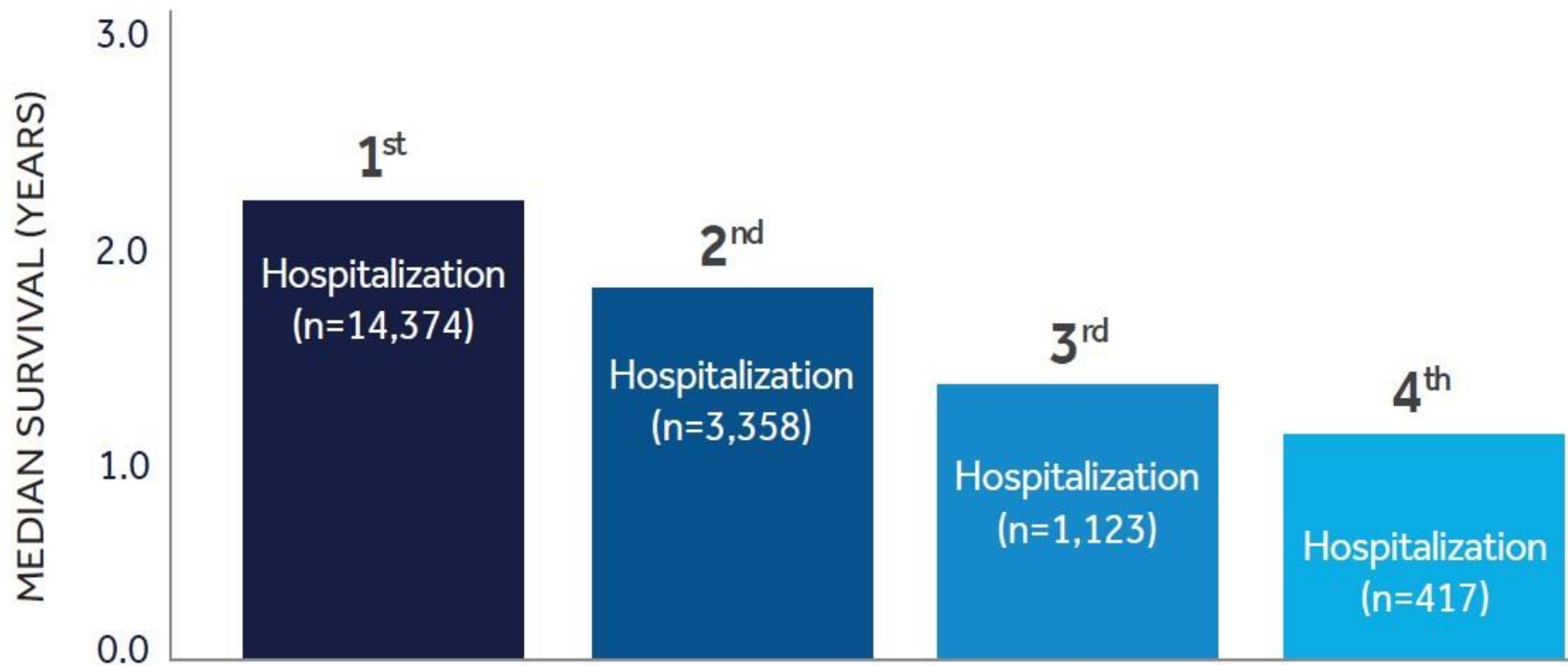


Referral before right ventricular failure develops is preferable

“Indeed, earlier ventricular assist device implantation in less severely ill patients and **before right ventricular or multi-organ failure develops**, leads to better surgical outcomes.”<sup>2</sup>

# HOSPITALIZATION

MEDIAN SURVIVAL DECREASES  
AFTER EACH HEART FAILURE-  
RELATED HOSPITALIZATION<sup>4</sup>



# Intermacs® Classifications

- The Intermacs® scale defines the progression of advanced heart failure to better determine timing for Transplant or LVAD referral.

Definition	Description	Timescale for Intervention
1. Critical cardiogenic shock	“Crash and burn”	Hours
2. Progressive decline	“Sliding fast”	Hours to days
3. Stable but inotrope dependent	“Stable but dependent”	Weeks
4. Recurrent advanced heart failure	“Frequent flyer”	Weeks to months
5. Exertion intolerant	“Housebound”	Variable
6. Exertion limited	“Walking wounded”	Variable
7. Advanced NYHA class III	“Advanced NYHA class III” closely	<b>Get surgeons involved even before this stage &amp; watch</b>

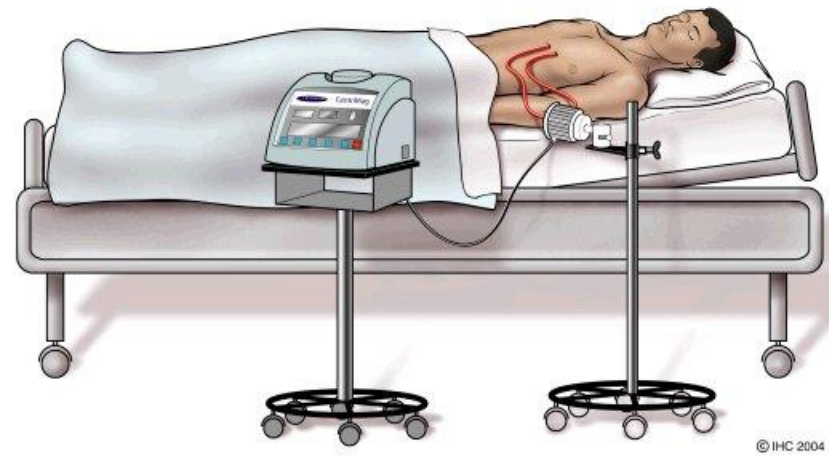


# Distinctive features in the Indian Heart failure and Post heart Transplant patient

- Indian Patients typically present quite late for heart Transplant especially in INTERMACS grades 3 or less.
- Higher creatinine levels more than 2.5, jaundice and other parameters of altered Liver dysfunction, with Increased Frailty Index and poorer Nutritional status Compared to their western counterparts.
- Also, the Pulmonary vascular resistance (PVR) tends to be higher in Indian patients with end stage Heart failure, Needing special vasodilator drug testing protocols and Special pre and perioperative Drugs regimens to Combat higher Pulmonary vascular resistance (PVR) after HTx.



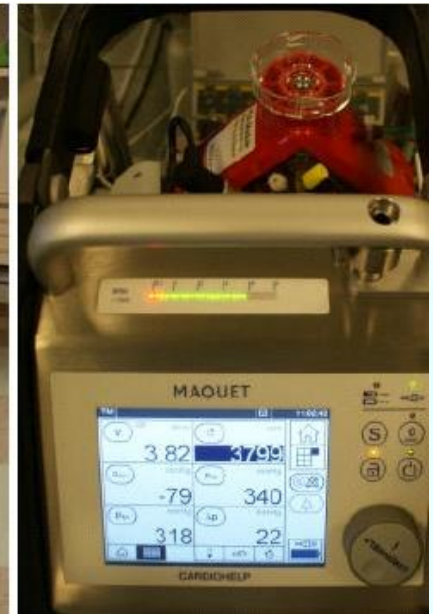
# Short-Term Extracorporeal Assist Devices



Courtesy of Levitronix,



- **Levitronix CentriMag**
  - Magnetically-levitated centrifugal pump
  - Continuous-flow rotary pump
  - Electrical actuation– magnetic coupling of the motor and impellor
  - Capable of 6 ~ 9 L/min at 5500 RPM
  - Left, Right, or Biventricular support
  - Operative placement requiring sternotomy
  - Bridge to recovery



**Extra Corporeal Membrane Oxygenation ( ECMO )**

# Heart transplant-world 1967,India 1994 (Between 2016 todatte more than 350 . No.of centers 82)

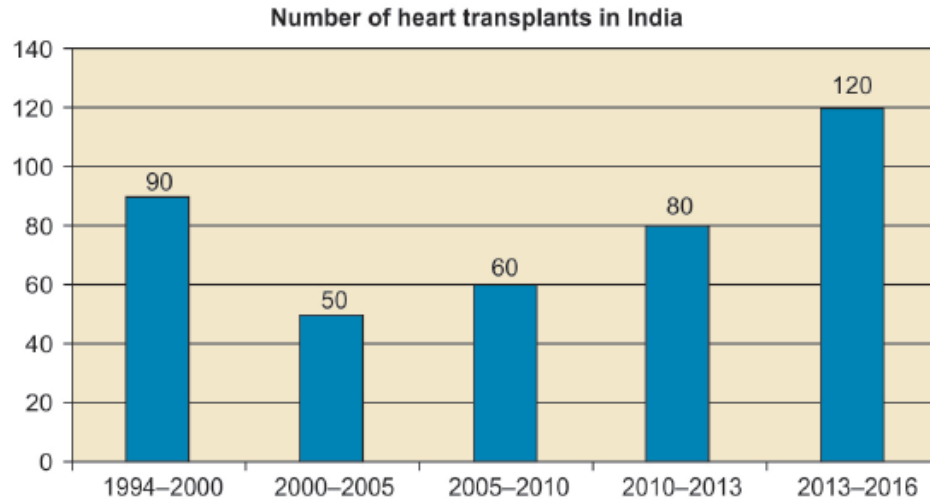


Fig. 1 Approximate number of hearts transplanted In India since its inception in 1994

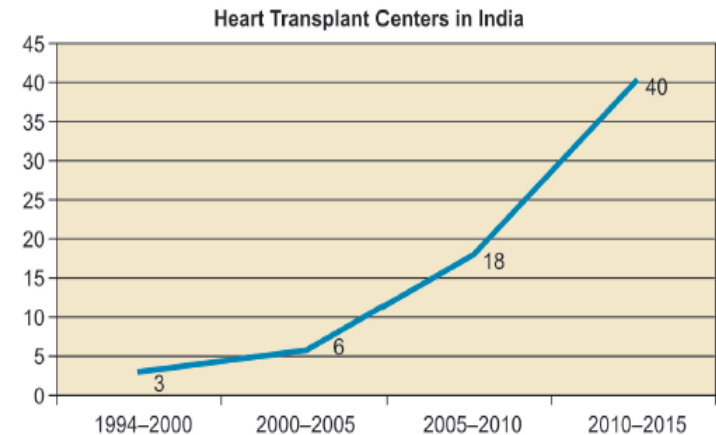
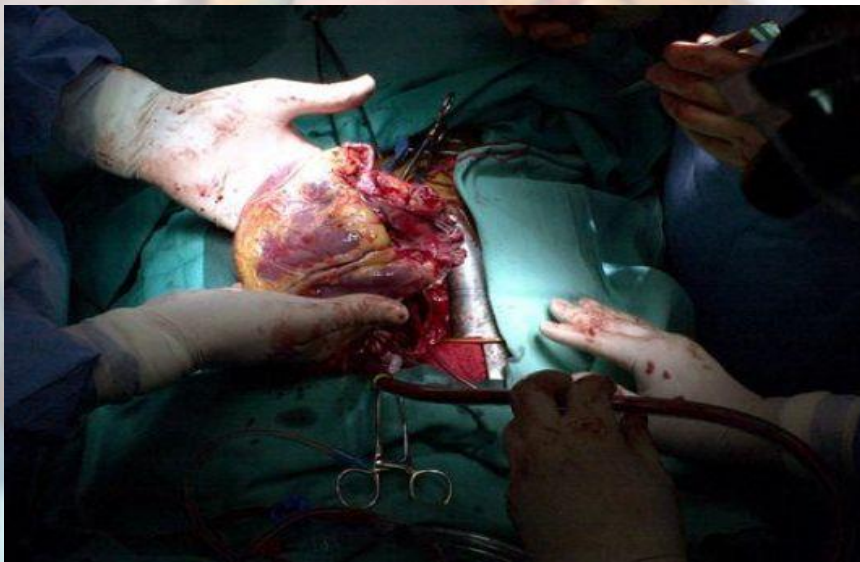
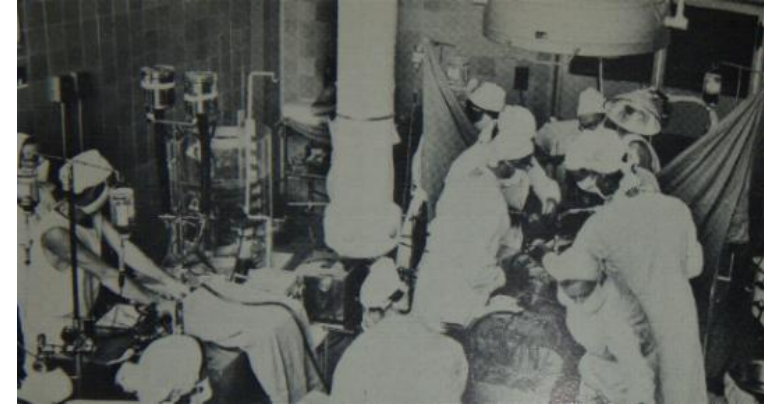


Fig. 2 The growth in number of transplant centers in India

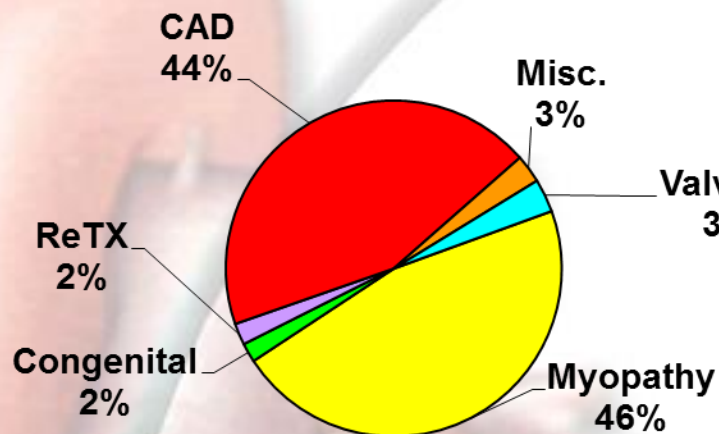


# Heart transplant in **INDIA-2018** : some facts

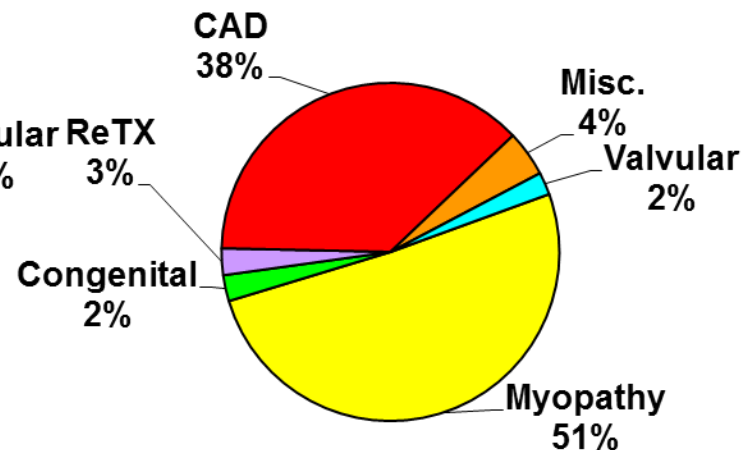
- From 2016 more than 400 transplants across india ( **2/3<sup>rd</sup> by the 5 Fortis hospitals,Chennai,Mumbai,Banglore,Delhi,Kolkota,lead by Malar/Fortis in Chennai** ).The entire Europe together did less than 100 in this period.
- 82 centers across india performing heart Tx,including govt teaching hospitals or smaller cities like the Nizam's,AIIMS,PGI, Jayadeva,Kottayam med collage,Belgaum medical collage,Aurangabad etc.
- Improving organ donation sentiment, better govt streamlining (State and national Rota) ,improved state-center coordination & frugal indian innovations has led to better organ availability in numbers than in the western world
- The problem in India is of very few patients registered at any given time & donor hearts being acually wasted (despite of almost 25 lakhs pts with advanced heart failure in India).Physicians,Cardiologists & surgeons need to work together as a tight team without any personal agendas.



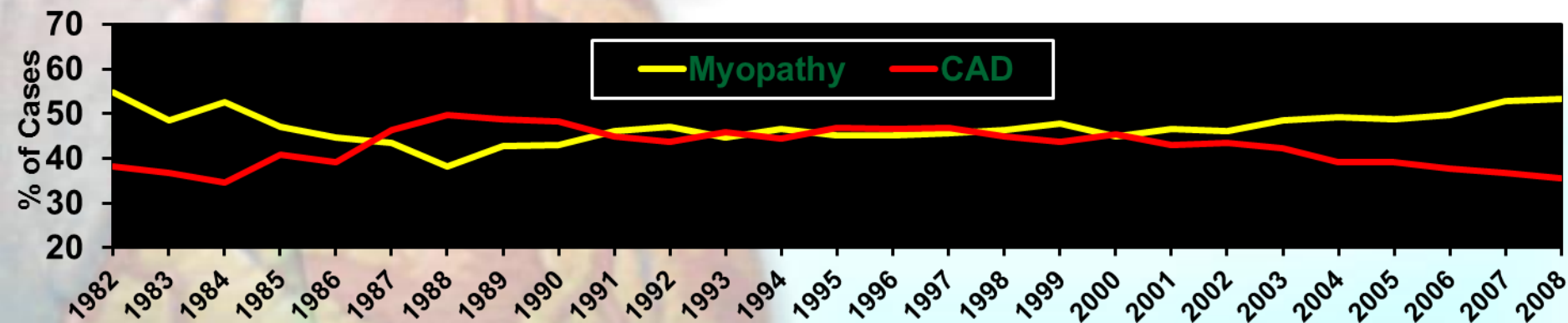
# DIAGNOSIS IN ADULT HEART TRANSPLANTS



1/1982-6/2008



1/2005-6/2008

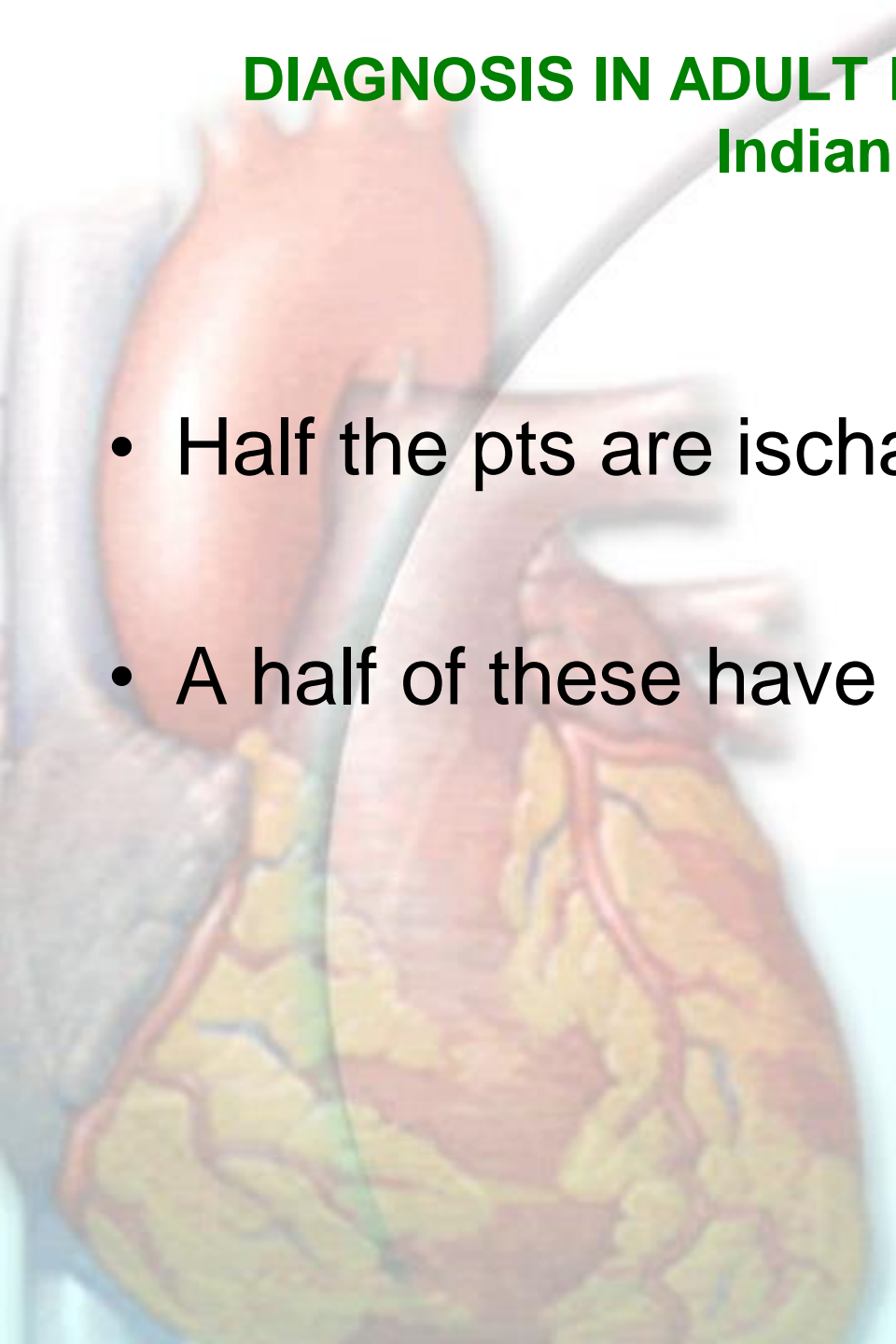


ISHLT

# DIAGNOSIS IN ADULT HEART TRANSPLANTS

## Indian scene

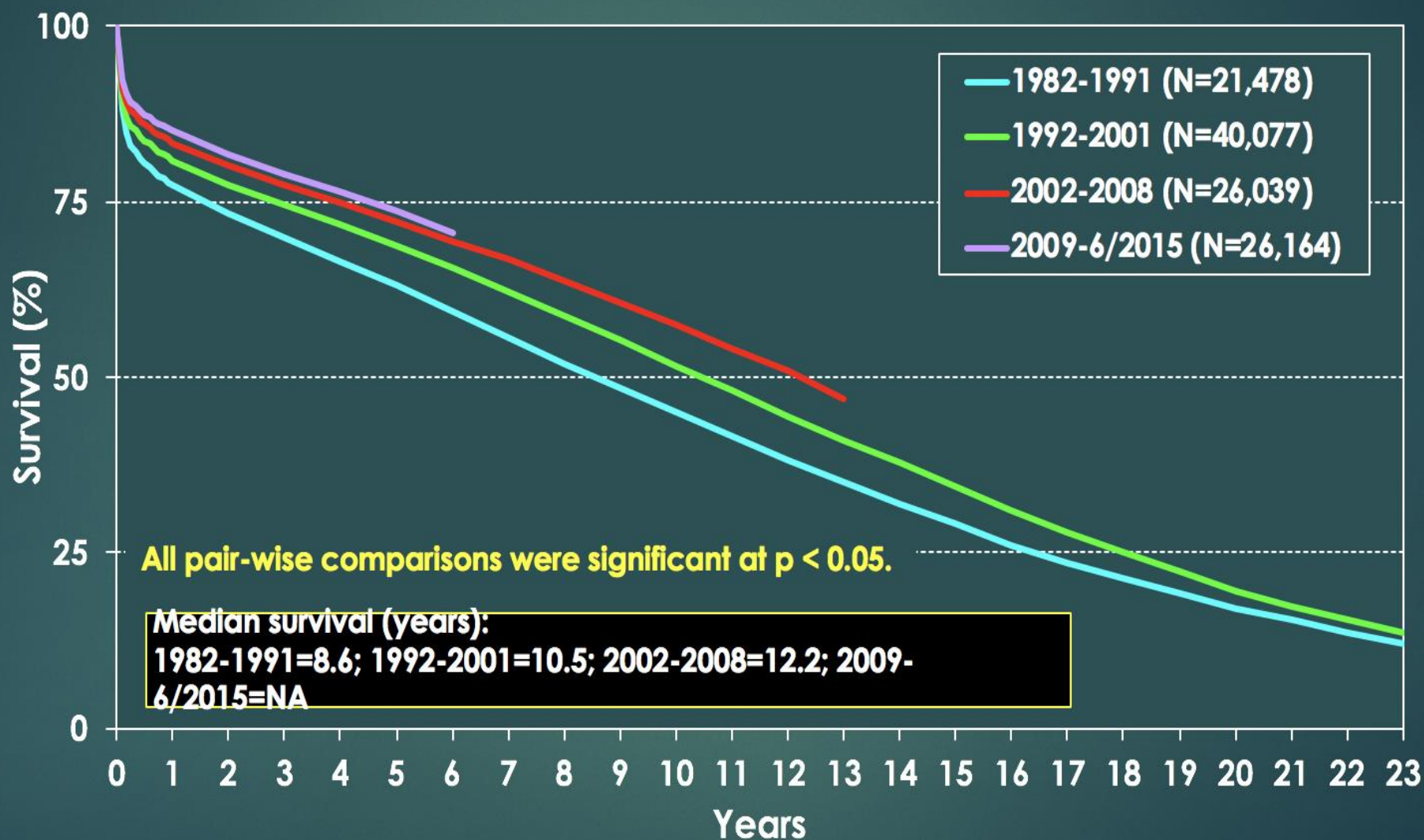
- Half the pts are ischaemic cardiomyopathy
- A half of these have Diabets Mellites



# Adult Heart Transplants

## Kaplan-Meier Survival by Era

(Transplants: January 1982 – June 2015)

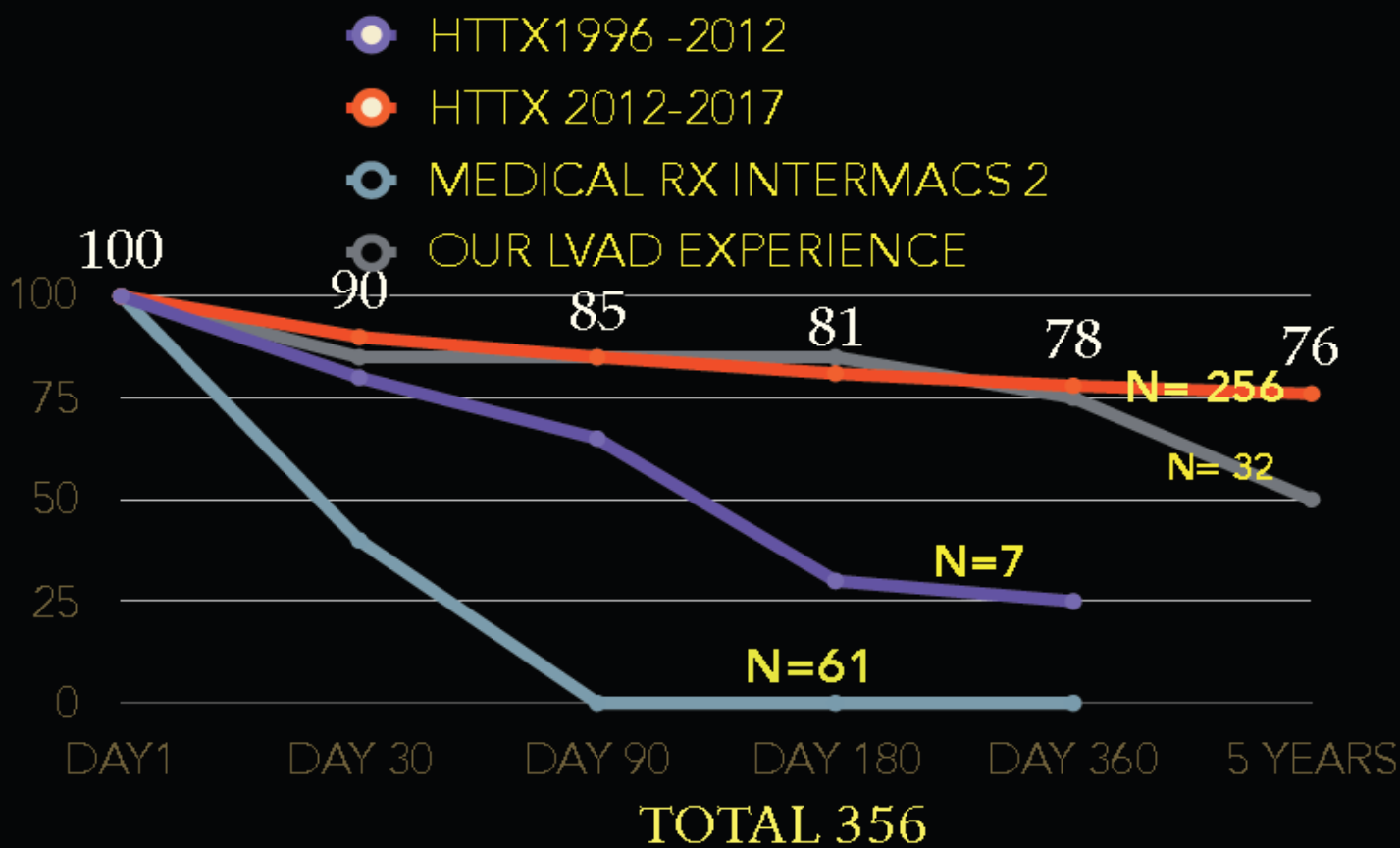




- Fortis experience :

- 1) Paediatric Tx-actural 5 yr survival 82% 2) 61 pts who were advised Tx but didn't undergo for various reasons,died in 90 days

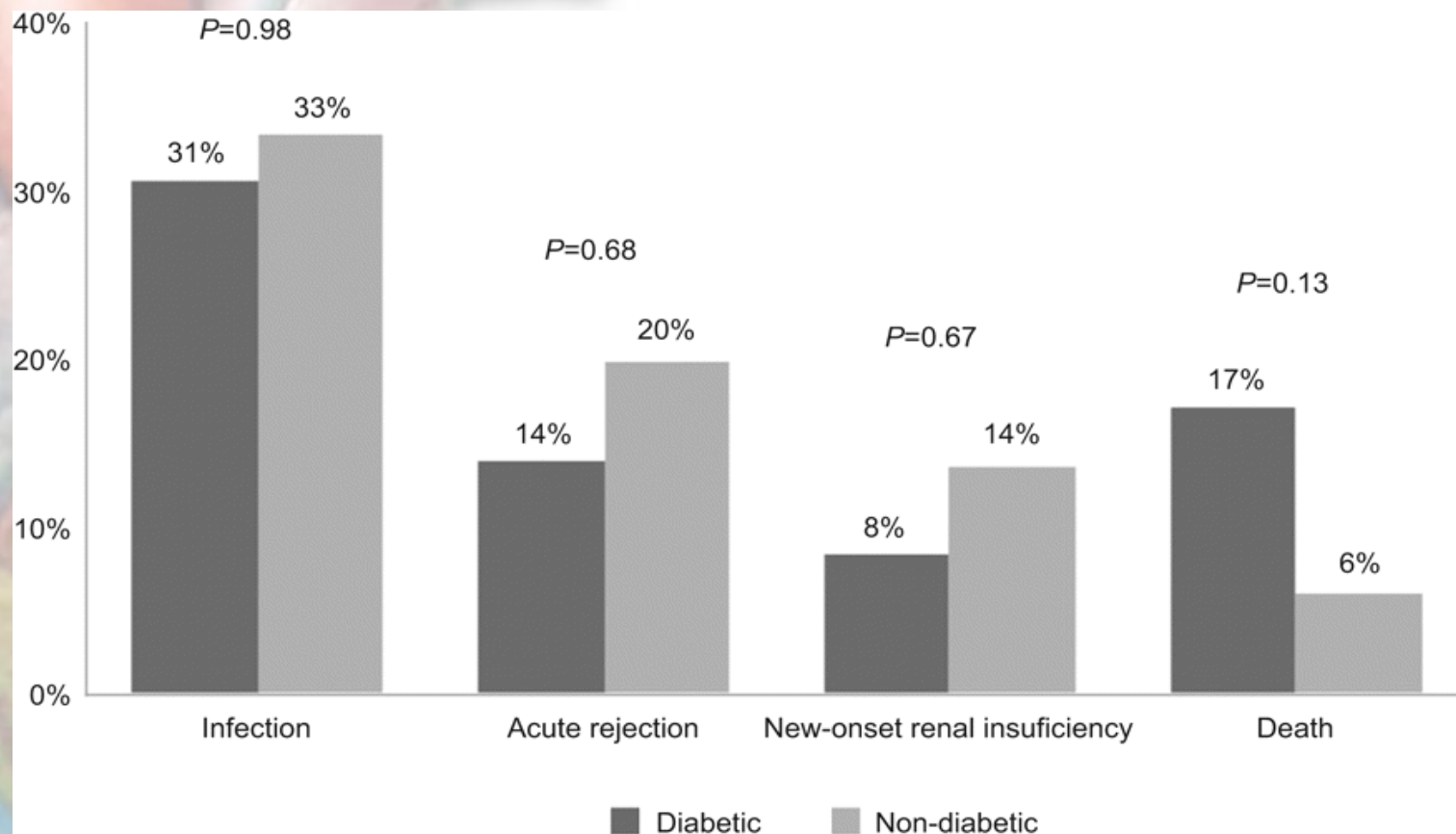
CURRENT RESULTS OF HEART TRANSPLANTATION AND LVAD IN OUR PROGRAMME





## Diabetes as an outcome predictor after heart transplantation- Joana Saraiva , Manuel J. Antunes - *Interactive CardioVascular and Thoracic Surgery*, Volume 13, Issue 5, November 2011,499–504,

- In conclusion, no significant difference was seen in the prognosis of those with diabetes during the first year after heart transplantation, as long as patients maintained tight glucometabolic control.

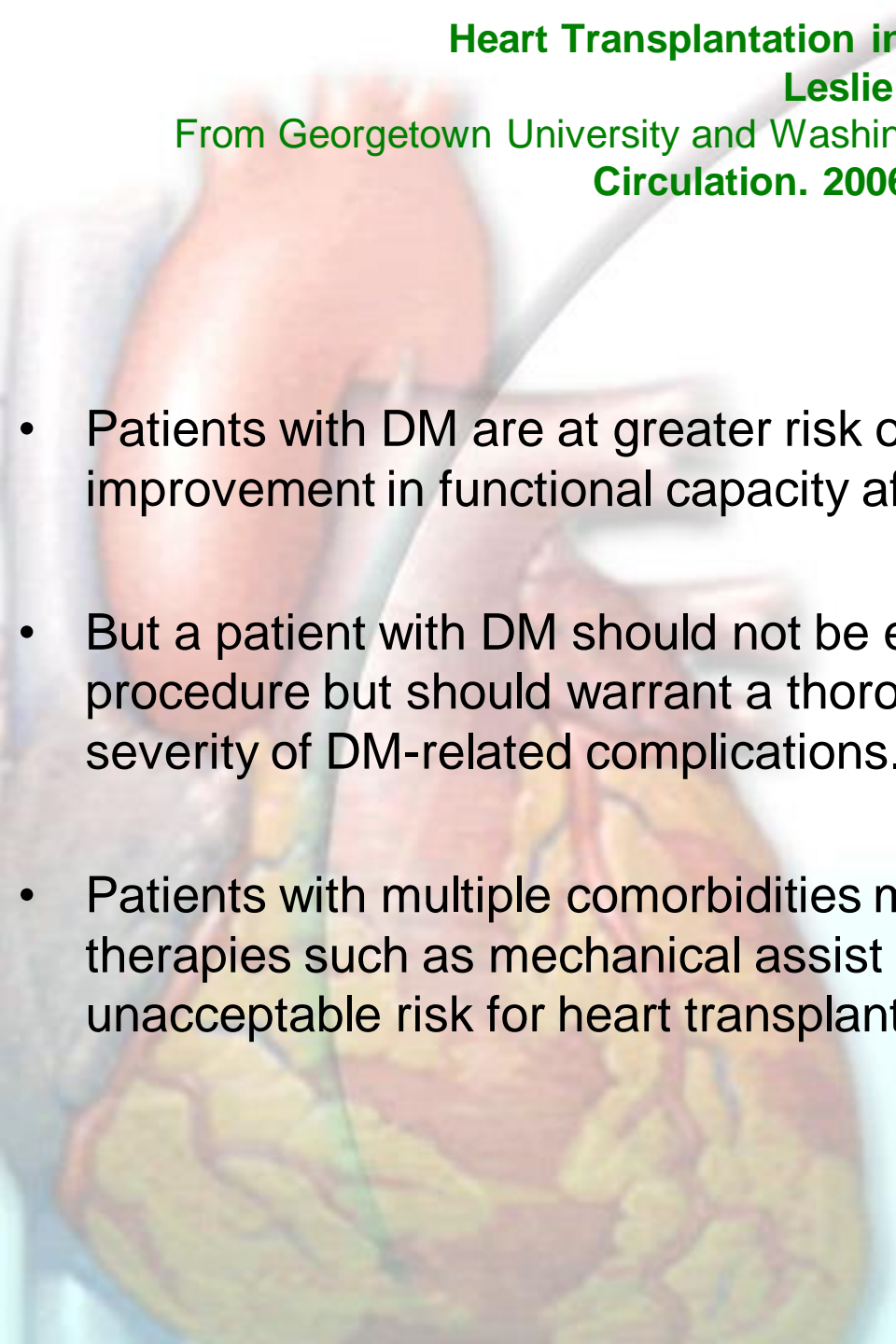


# Heart Transplantation in Patients With Diabetes

Leslie Miller

From Georgetown University and Washington Hospital Center, Minneapolis, Minn.

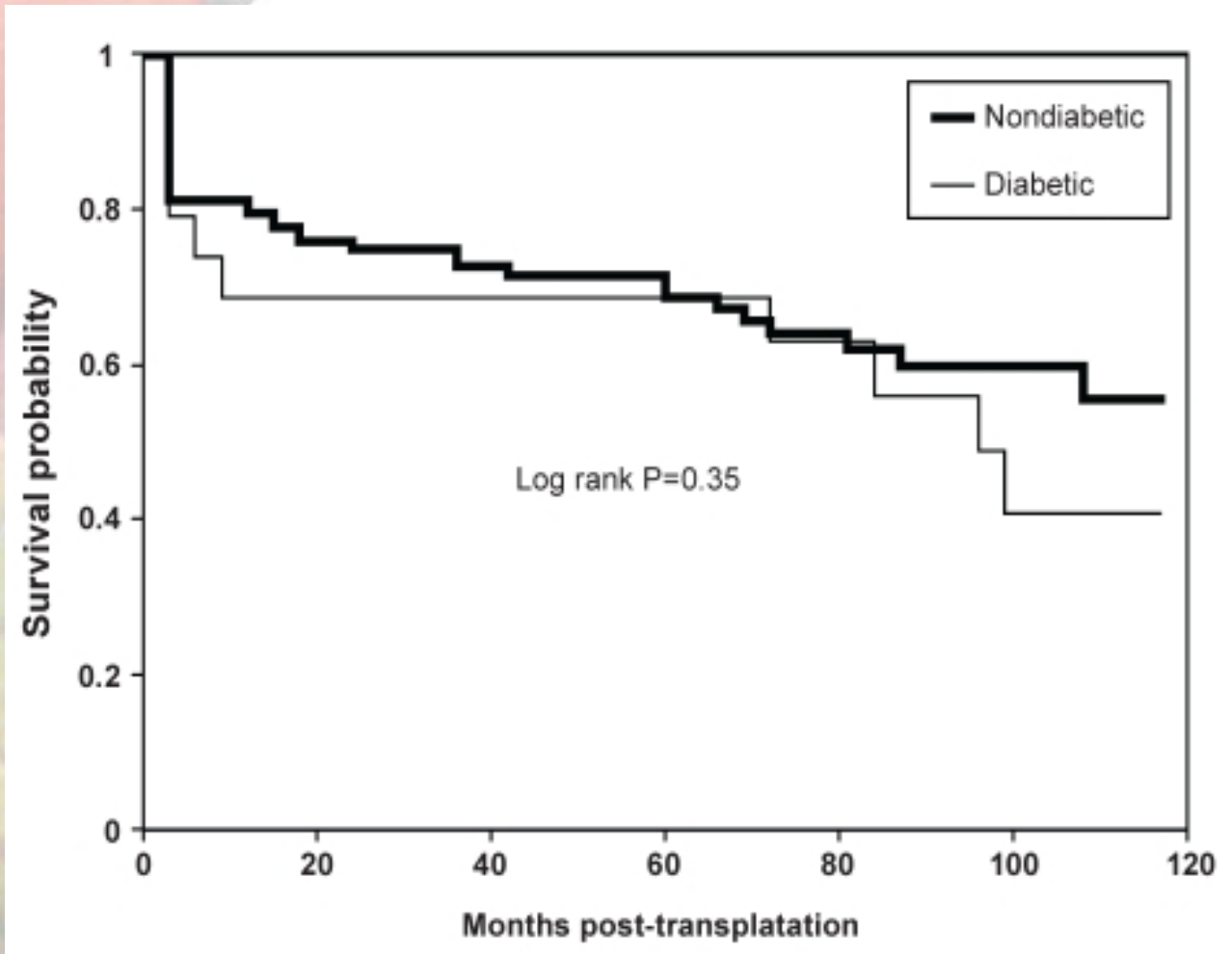
**Circulation. 2006;114:2206–2207**

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- An anatomical illustration of a human heart, showing the major blood vessels (aorta, pulmonary artery, and pulmonary veins) and the coronary arteries. The heart is depicted in a realistic, slightly translucent style, with the coronary arteries highlighted in a darker red color. The background is a light blue gradient.
- Patients with DM are at greater risk of lower survival rate and less improvement in functional capacity after heart transplantation.
  - But a patient with DM should not be excluded from consideration for the procedure but should warrant a thorough assessment of the number and severity of DM-related complications.
  - Patients with multiple comorbidities may have a better outcome with other therapies such as mechanical assist devices and represent a potentially unacceptable risk for heart transplantation.

[Can J Cardiol. 2009 Apr;25\(4\):e125-9.](#)

## Increased morbidity in diabetic cardiac transplant recipients.

[Higgins J<sup>1</sup>](#), [Pflugfelder PW](#), [Kostuk WJ](#)

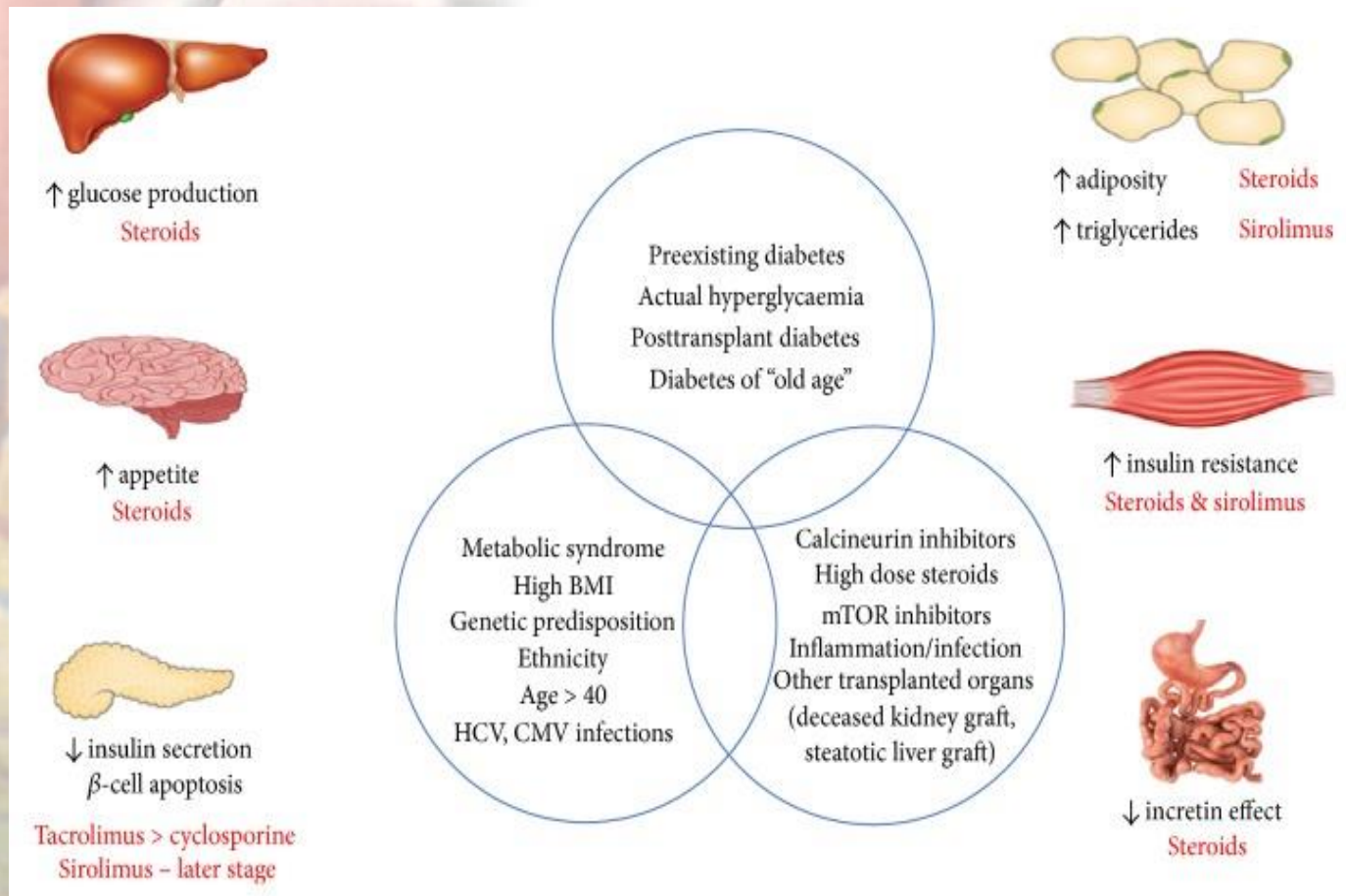


**Heart transplantation in diabetic recipients: a decade review of 161 patients at Columbia Presbyterian** -Morgan JA, John R, Weinberg AD, Colletti NJ, Mancini DM, Edwards NM. ....J Thorac Cardiovasc Surg. 2004 May; 127(5):1486-92.

- These results demonstrate similar short-term and long-term survivals, as well as similar risks for infection and transplant coronary artery disease, in diabetic and nondiabetic patients undergoing cardiac transplantation.
- The trend toward worse survival in the diabetic cohort, however, raises the possibility that if a greater number of diabetic patients were evaluated, a significant difference in survival might be observed, suggesting the need for a multicenter analysis to validate these outcomes.

# Management Strategies for Posttransplant Diabetes Mellitus after Heart Transplantation: A Review. ....Cehic MG, Nundall N, Greenfield JR, Macdonald PS. J Transplant. 2018; 2018:1025893. Epub 2018 Jan 29.

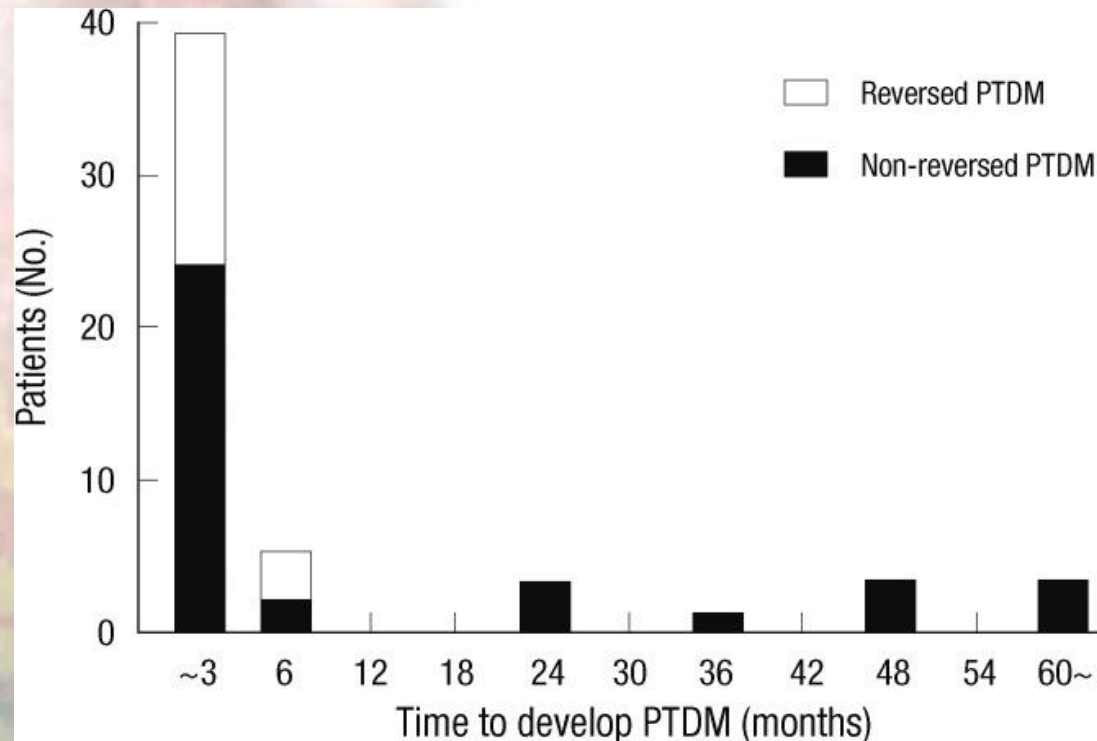
- Post-transplant diabetes mellitus (PTDM) is a well-recognized complication of heart transplantation and is associated with increased morbidity and mortality

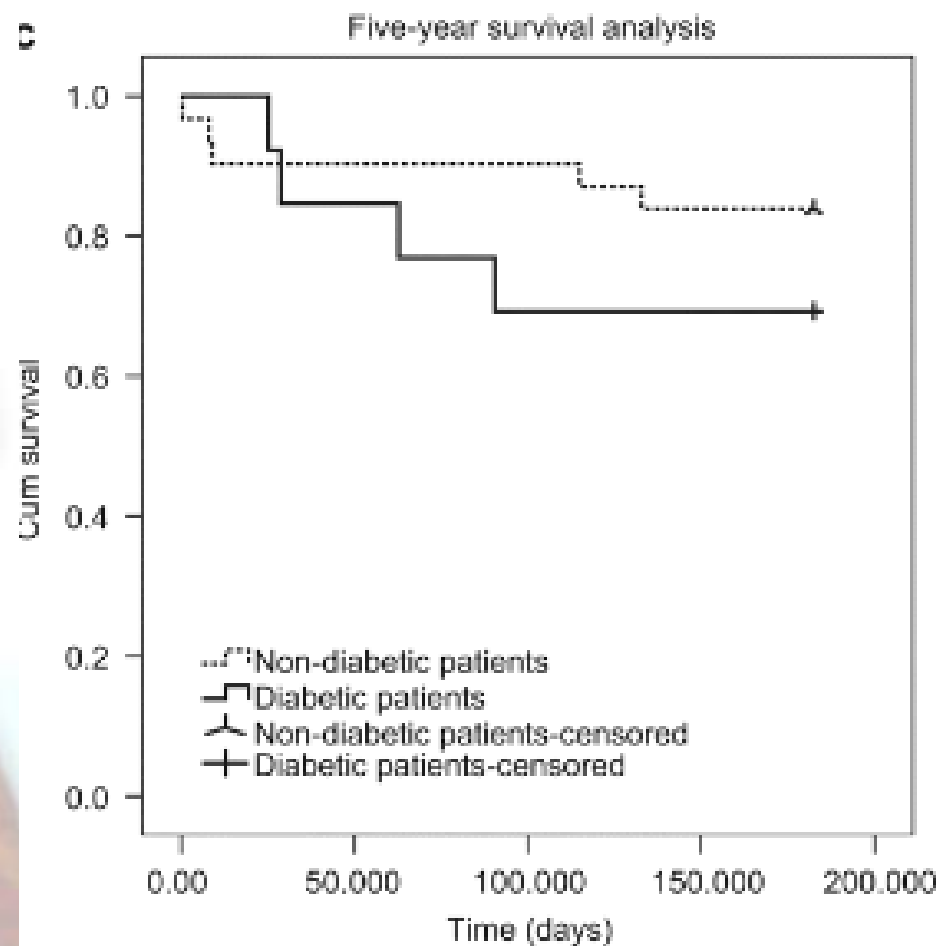
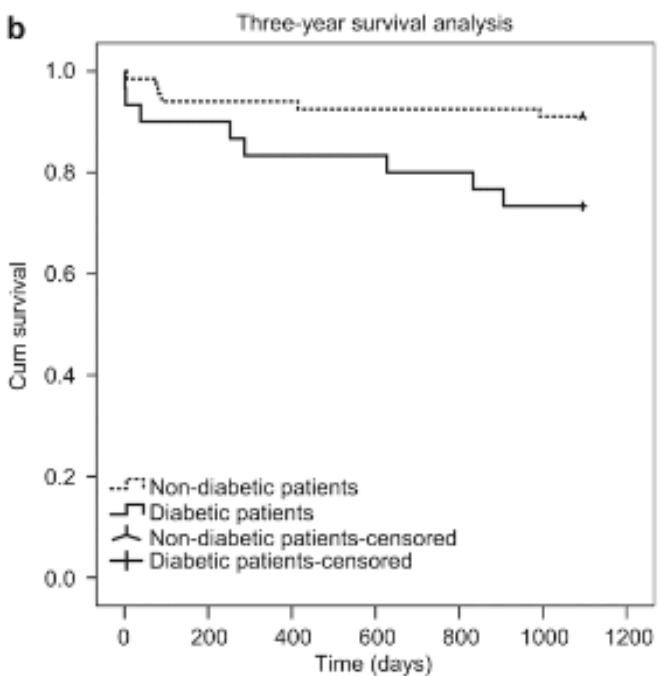
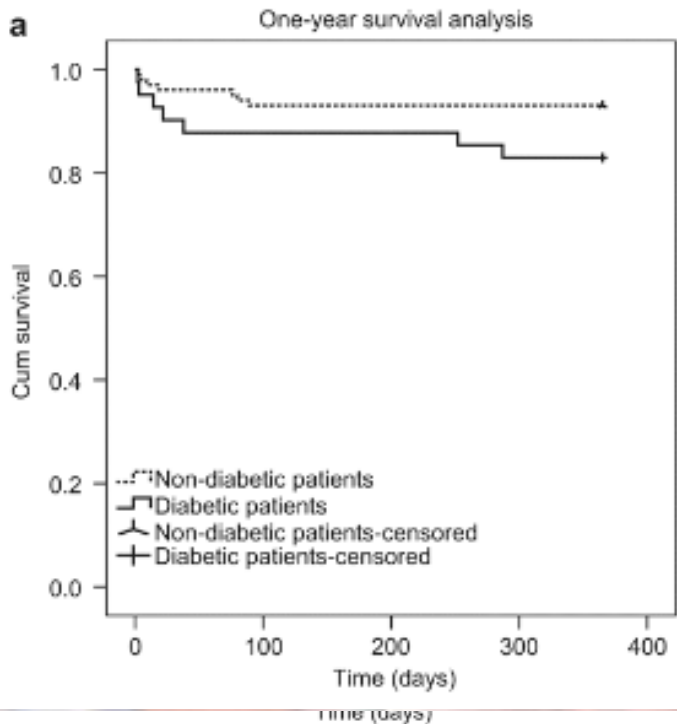




**The clinical course and outcomes of post-transplantation diabetes mellitus after heart transplantation.** Cho MS, Choi HI, Kim IO, Jung SH, Yun TJ, Lee JW, Kim MS, Kim JJ. *J Korean Med Sci.* 2012 Dec; 27(12):1460-7. Epub 2012 Dec 7.

- PTDM was reversed during the follow-up period, and the reversal of PTDM was critically dependent on the time taken to develop PTDM ( $1.9 \pm 1.0$  months in the reversed group vs  $14.5 \pm 25.3$  months in the maintained group,  $P = 0.005$ ).







# Summary

- The current average survival rate of 80% to 85% at 1 year after transplantation and 60% to 65% at 5 years after transplantation.
- However, the outcomes with this procedure are not uniform and are influenced significantly by the presence of comorbidities such as end-organ dysfunction, malnutrition, and overall functional status at the time of the procedure
- However, until now, the published literature in this area has only addressed the impact of DM on survival, without analysis of the impact of DM-related comorbidities on outcome. Type 1 DM may have worse impact.
- DM should warrant a thorough assessment of the number and severity of DM-related complications. Patients should be very prepared and there should be a tight periop & long term postop glycaemic control
- Patients with multiple comorbidities may have a better outcome with other therapies such as mechanical assist devices and represent a potentially unacceptable risk for heart transplantation.

*Thank  
you ....*

