

# Optimisation of the patient for Heart Transplantation

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# CHD AND TRANSPLANTATION

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- CHD patients are 3% of HT recipient population
- Prevalence of HT has increased 40% in CHD population since 1999
- No established prognostic markers to help guide listing
- More likely to die on waiting list
  - Increased incidence of sudden death and HF death
  - Lower priority
  - Donor issues
  - Less likely to get mechanical support 3 vs 17%
  - Increased need for multi-organ transplantation
- Higher peri-operative mortality
- 2x risk of mortality in the first year
- Better long term survival ( median 18 years)

# CRITERIA FOR HEART TRANSPLANTATION

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- Stage D HF refractory to medical therapy with no alternative surgical options
- CHD with near sudden death or life-threatening refractory arrhythmias
- Reactive pulmonary HTN & risk of developing fixed PVR in near future
- Paediatric
  - Growth failure
  - Severe stenosis/atresia of coronary arteries
  - Cyanosis non-amenable to surgery
  - Protein losing enteropathy

# TRANSPLANT ASSESSMENT

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## **Clinical assessment (Tx cardiologist)**

- Severity of heart failure
- Other medical problems
- Understanding of transplant process
- Desire for transplantation
- Contra-indications to heart transplant

## **Investigations**

- Blood tests
- Echocardiogram
- Radiology (CXR, abdominal ultrasound, others as indicated)
- Cardiopulmonary exercise test
- Right and left heart catheter

## **Psychosocial assessment**

- Support
- Vices
- Ability to engage with team/report problems/take medications

## **Combined meeting**

- Cardiologists
- Cardiac surgeons
- Transplant coordinators
- Physiotherapists
- Psychologists/psychiatrist
- Social worker
- Dietician

# GOALS OF MANAGEMENT ON ACTIVE WAITING LIST

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- Optimise Cardiac Function
  - Identify and Manage Deterioration
- Address co-morbidities e.g. obesity, poor nutrition
- Identify and Address Psychosocial risk factors for poor outcomes
- Identify Immunosuppressive Risks

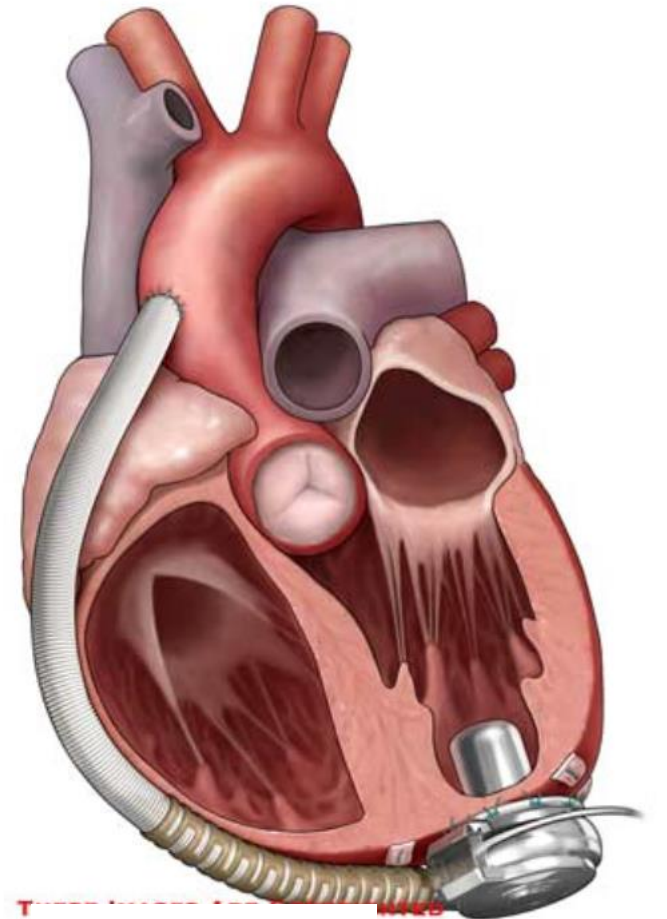
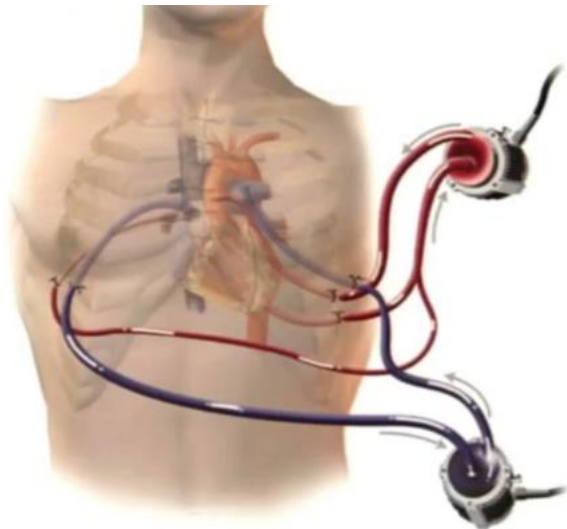
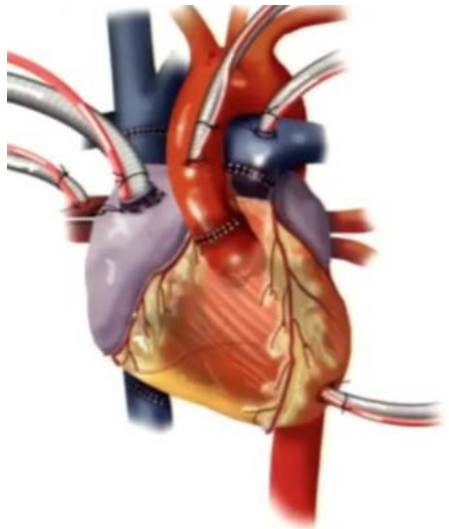
# OPTIMISING CARDIAC FUNCTION

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- Standard heart failure therapy
  - Diuretics
  - ACE-inhibitor
  - B-Blocker
  - Spironolactone
  - (Entresto)
  - CRT
  - ICD
- Address exacerbating factors
  - E.g. Iron Deficiency
- When this fails, what next?

# MECHANICAL SUPPORT

- Should be considered when:
  - Clinical deterioration
  - 'Bridge to Decision'
    - Potentially reversible or treatable contra-indications eg. PHTN, obesity
  - Adequate ability and support to manage device



# MECHANICAL SUPPORT

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## CONTRA-INDICATIONS

- Infection – active systemic
- Compromised haemostasis
  - Bleeding disorders
- Significant AR
- Severe RV dysfunction (relative)
- Complex CHD (relative)
- Psychosocial contra-indication

## COMPLICATIONS

- Bleeding
  - Up to 40% have GI bleeding
- Infection
  - Driveline 20 – 60%
- Stroke
  - More common in women
- Pump Thrombosis
- AR
- Arrhythmia
  - Often VT improves post LVAD



# MCS AND ACHD

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- "Simple" pathology can be addressed at the time e.g. ASD closure
- Mostly case reports in complex disease
- Case series in congenitally corrected transposition of the great vessels
  - 3 patients
  - Heart Mate II Device
  - All successfully implanted
- Most recent guidelines recommends:
  - 1) Need assessment of full cardiac morphology (including location of great vessels, shunts, and collateral vessels, assessed before MCS)
  - 2) For non- MCS candidates assessment for total heart replacement strategies is recommended important.
  - 3) A multi-institutional MCS single-ventricle registry that better defines selection criteria should be established

# MECHANICAL SUPPORT

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## CASE ONE

- 43yr old male
- Chemotherapy induced cardiomyopathy
- NHYA II-III
- RHC:

		Post nitroprusside
■ MPA	44	25
■ PW	20	13
■ TPG	24	12
■ PVR	7.81	3.02
■ CO	3.2	4.3

## CASE TWO

- 60yr old male
- Ischaemic cardiomyopathy
- Rapid decline in function
  - Cardiac cachexia
  - NYHA IV
- Blood Group B

# AMBULATORY INOTROPES

- 1984 1x case report with Dobutamine
- 1994 bridge to transplant
  - 33 patients
  - Mean duration 4 months
- Advantages:
  - Patient freedom
  - Cost
  - Improved symptoms and clinical parameters
  - No operation
- Disadvantages
  - Catheter infection, thrombosis
  - Arrhythmia
  - Tolerance

	PA Mean (mmHg)	PCWP (mmHg)	Cardiac output (L/min)	PVR (Wood units)
Before inotropic therapy	41±3	24±2	3.3±0.2	5.3±0.6
24 hrs post-inotropic therapy	34±3	20±3	5.4±0.7	3.0±0.5
3–9 months post inotropic therapy	28±3	18±1	4.6±0.2	2.5±0.5

PA, Pulmonary artery; PCWP, pulmonary capillary wedge pressure; PVR, pulmonary vascular resistance

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# AMBULATORY INOTROPES

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- CASE ONE:
  - 52 year old man
  - Familial dilated cardiomyopathy
    - LVEF 23%
    - NYHA III
    - 4 admissions requiring levosimendan in 4 months prior to assessment
  - Comorbidities: DM, HTN, Obesity
  
- 11/2014: Accepted onto the active transplant waiting list
- 07/2015: Considered for LVAD. Pt declined
  - 4 further admissions with decompensated HF & renal failure in the following year
- 07/2015: Ambulatory inotropes started
- 04/2016: Cardiac Transplant

# IDENTIFYING PSYCHOSOCIAL FACTORS

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- “BEST INDICATOR OF FUTURE BEHAVIOUR IS PAST BEHAVIOUR”

		Absolute	Relative
Psychopathology	current		x
	history		x
Dementia/Cognitive Impairment		<b>x- Moderate to Severe</b>	<b>x - Mild</b>
Learning Disability			x
Personality Disorder			x
Adherence/motivation		x	
Suicide attempts	recent		x
	multiple	x	
	history		x

# IDENTIFYING PSYCHOSOCIAL FACTORS

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		Absolute	Relative
Substance Abuse	nicotine	x	
(current v previous)	alcohol	x	
	illegal/street	x	
Criminal behaviour/anti-social behaviour			x
Attitudes to Tx			x
Lack/instability of support		x	
Difficulty dealing with medical procedures			x

# INTERVENTION-ADHERENCE

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**No longer accept it is the responsibility of the patient – it is the responsibility of everyone**

# INTERVENTION

Trauma-focused cognitive-behavioural therapy (CBT)

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- Education to normalise reactions
- Distress tolerance for heightened emotions
- Cognitive restructuring to reduce frightening thoughts
- Techniques to create confidence and expectancy of recovery



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# IDENTIFY RISK FOR IMMUNOSUPPRESSION

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- Test for Communicable Disease
  - Influenza
  - HPV <45yrs
  - Tetanus, Diphtheria, Pertussis
  - Pneumococcal (1 &2)
  - Meningococcal 2
  - Haemophilus Influenzae
  - MMR
  - Hepatitis A & B
  - VZV
- Desensitisation for Reactive Antibodies