Element 75.00

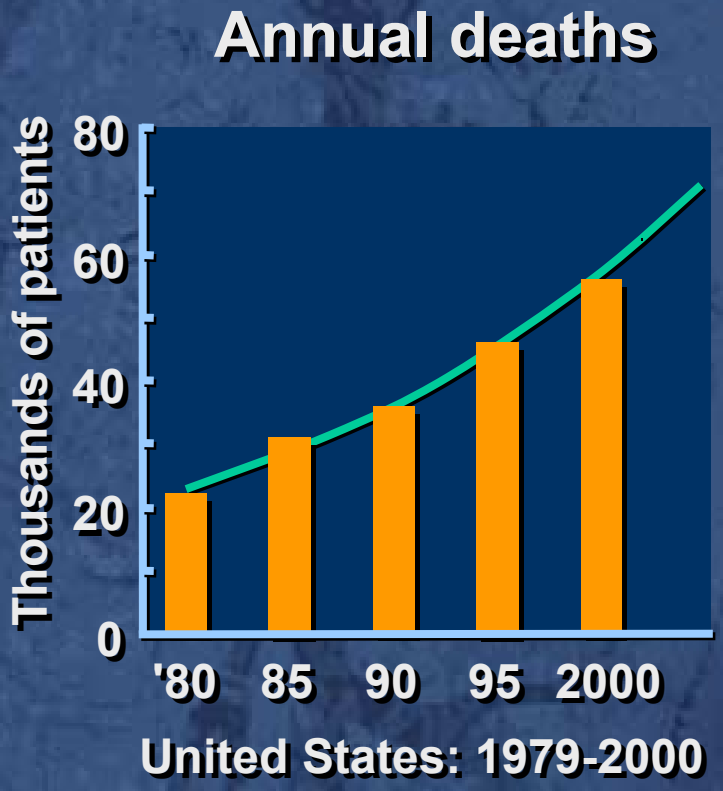
Bolling

CHF : An Expanding Concern

- 5 yr mort = 50%
- 10 yr mort = 75%

 # new cases/yr: 550,000

 # transplants: ~2,200



Source: National Center for Health Statistics, AHA

Transplantation

Gold standard:

65% 10 yr survival

But:

age limits & contraindications

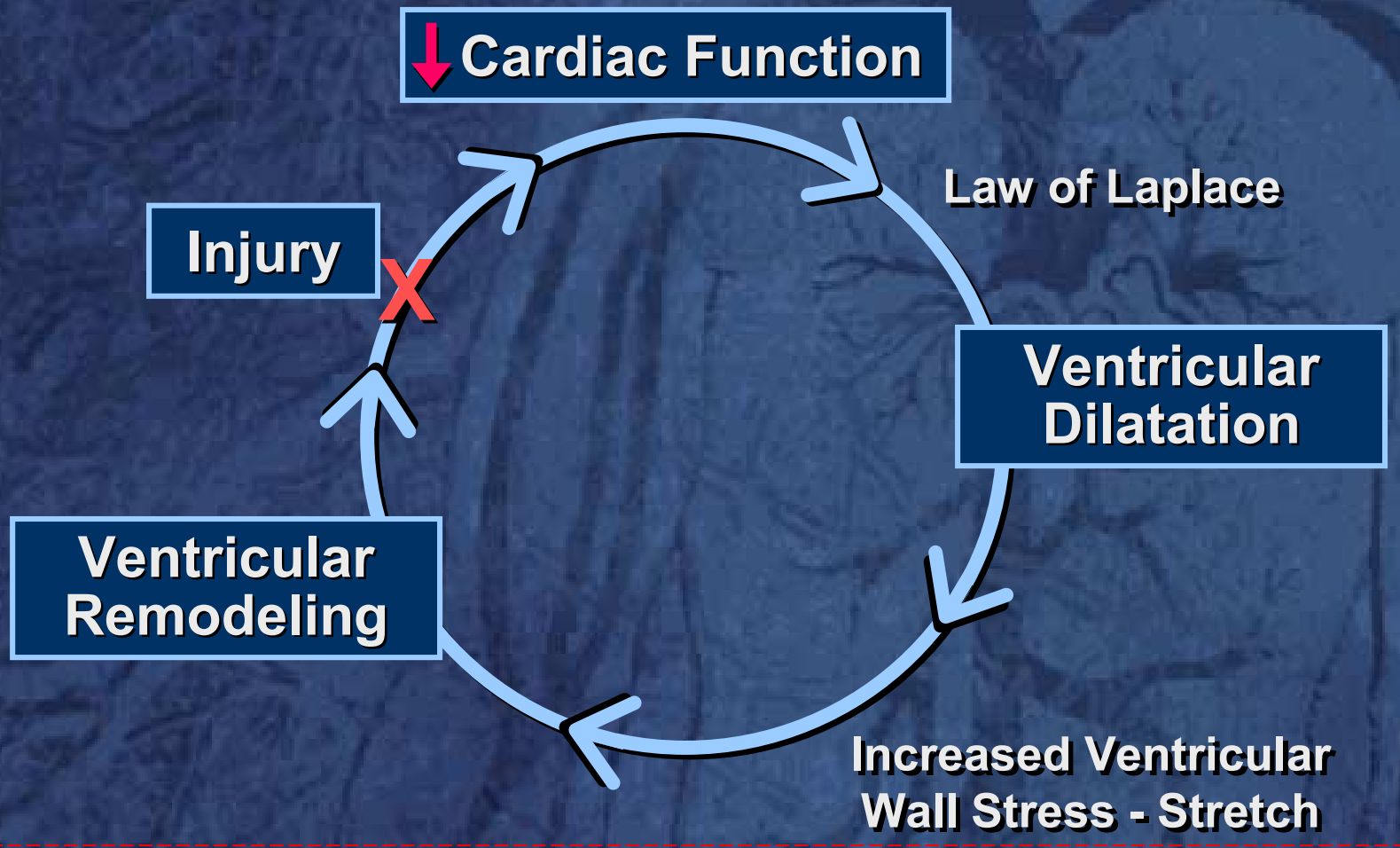
"exchange of diseases"

donor organ shortage

CHF Surgical Therapy

- **Geometric Surgery**
  - *Batista Operation*
  - *Mitral valve repair*
  - *Dor*
  - *Remodeling devices*
- **Emerging Options**
  - *Ventricular assist systems*
  - *Gene and cellular therapy*

The Vicious Cycle of Heart Failure



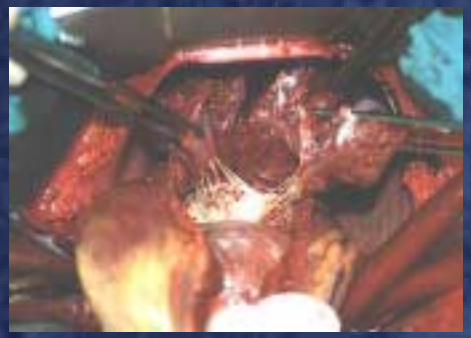
The Batista Operation

Partial left ventriculectomy

- LV Volume reduction
- ↓ myocardial wall stress
  ↑ cardiac function

The Batista Operation

Partial left ventriculectomy



Results (CCF):

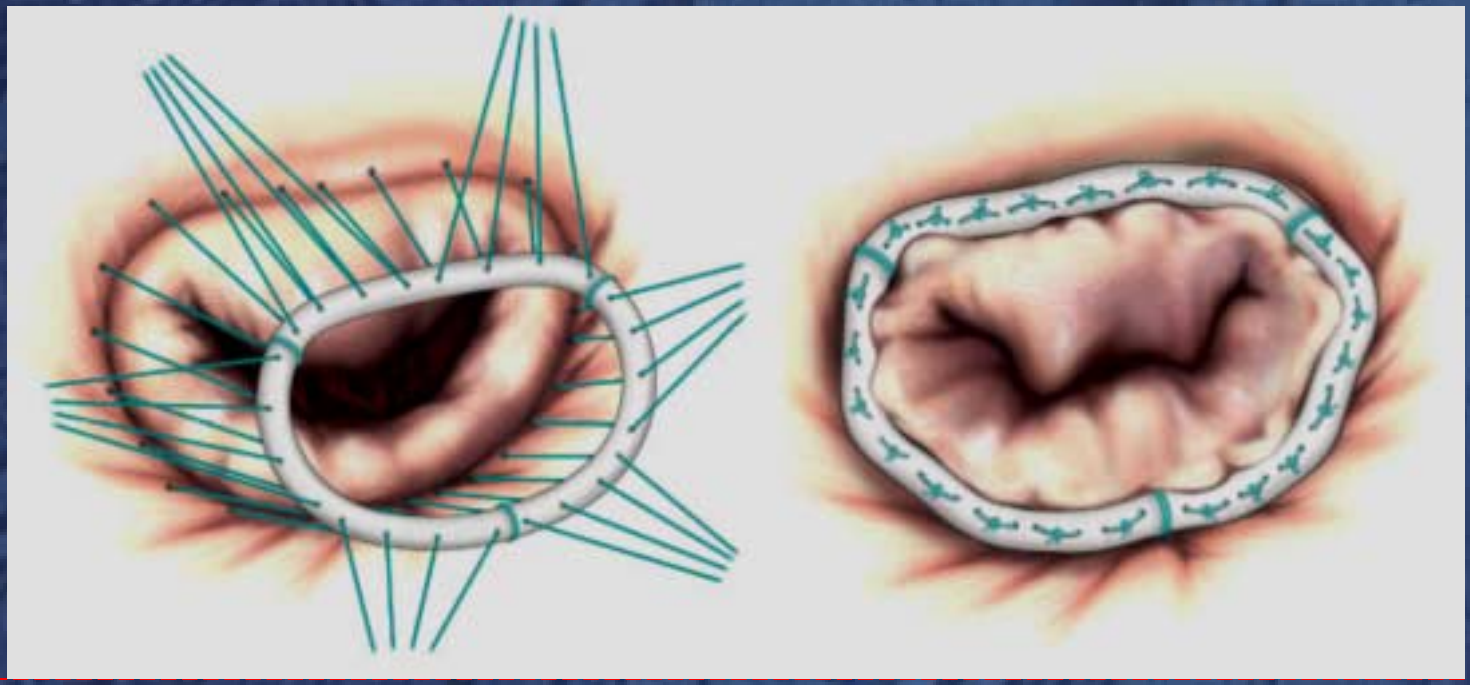
- 62 patients
- 6 mo: 38% re-listed for Tx
- 2 yrs: 60% re-listed for Tx

  20% well

Geometric Mitral Reconstruction

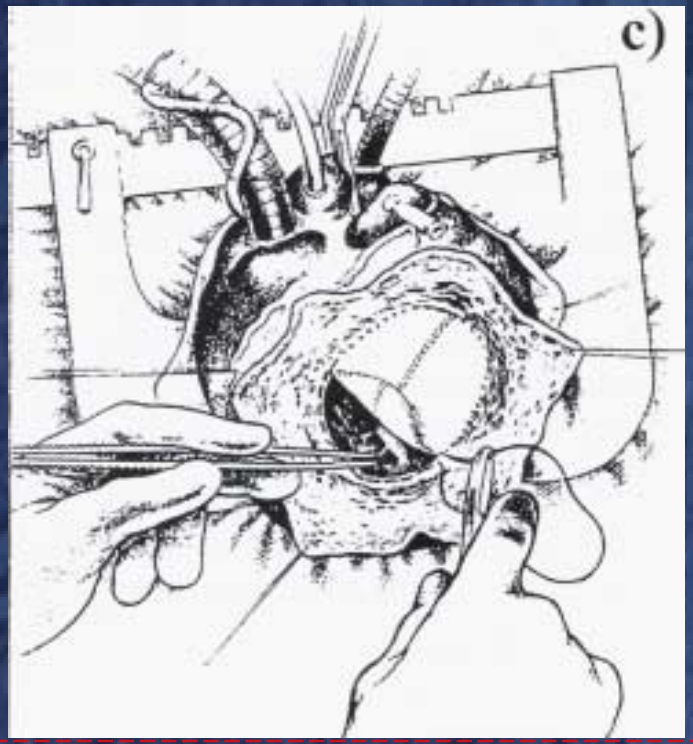
Improved LV function, Decreased LV wall stress

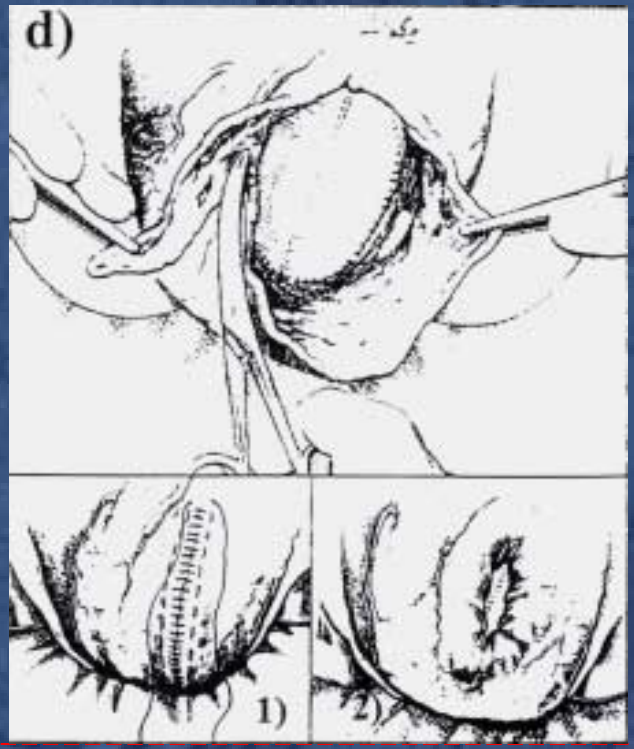
Outcomes = Transplant



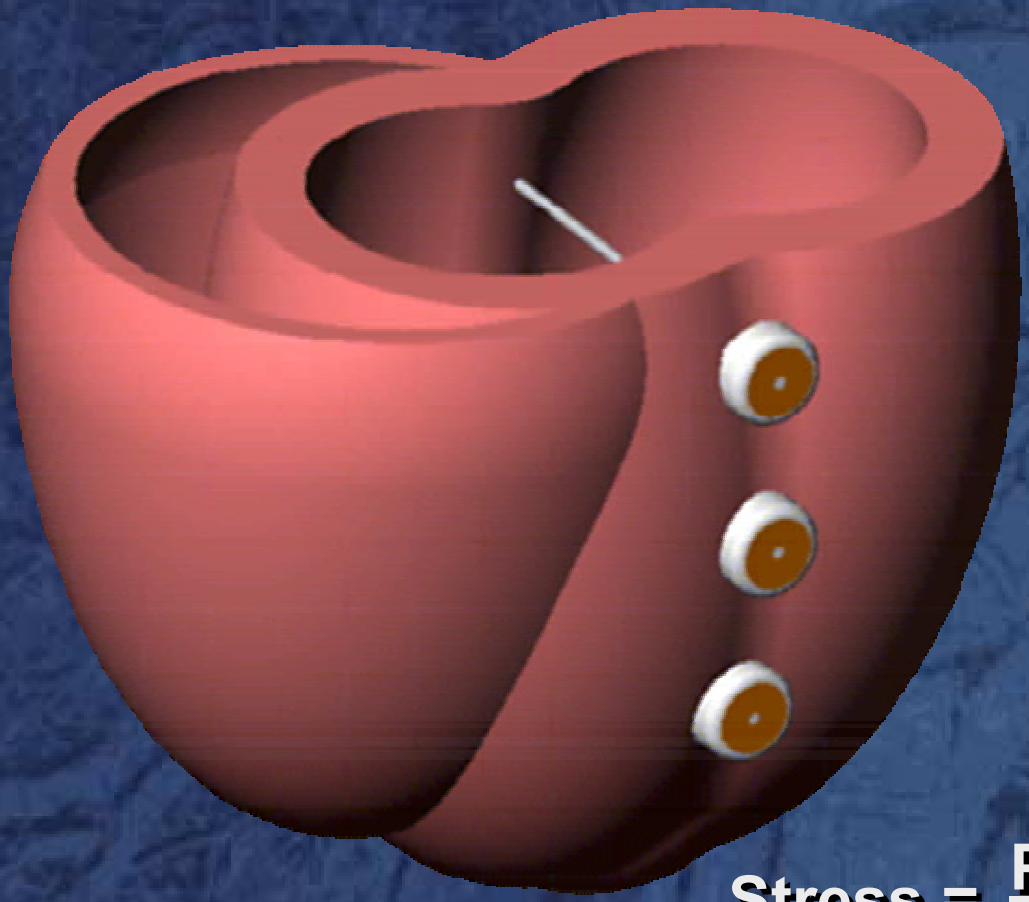
Dor Procedure

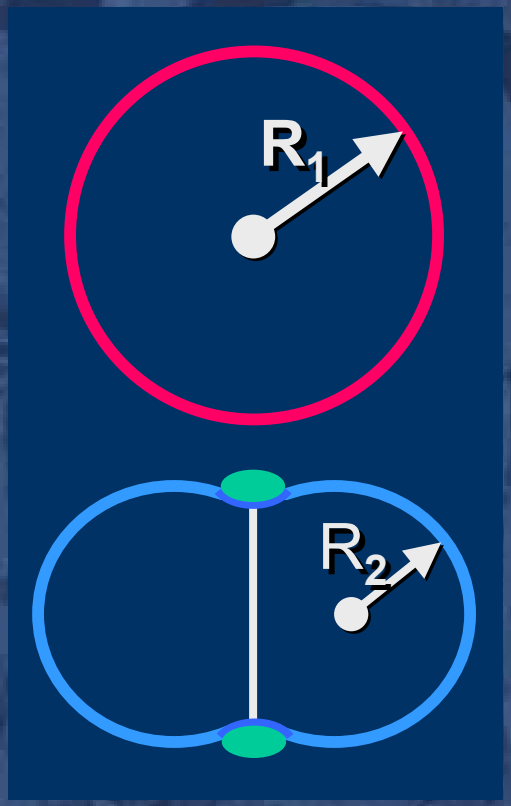
Remodels akinetic LV
scar / aneursymal dilatation





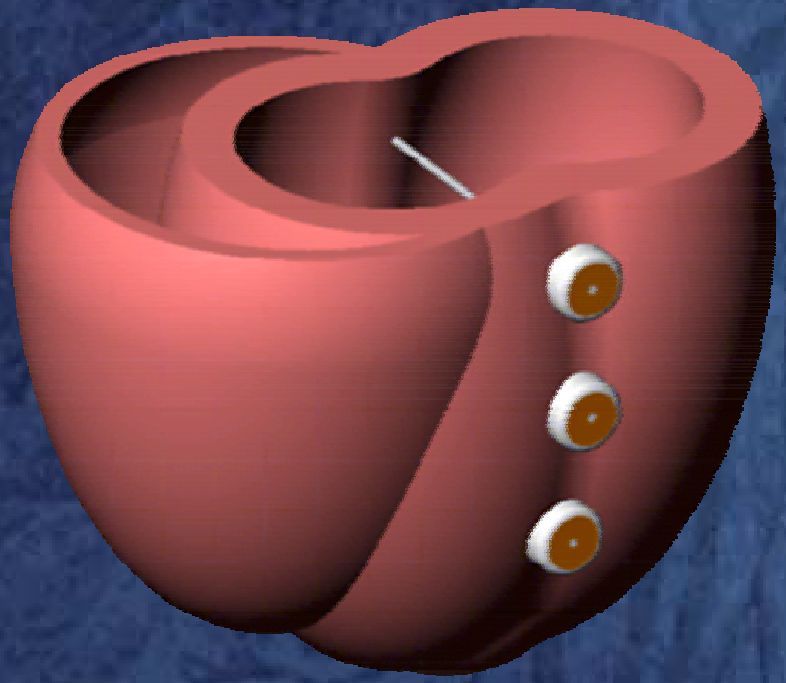
Myocor Concept





$$\text{Stress} = \frac{\text{Pressure x Radius}}{\text{Wall Thickness}}$$

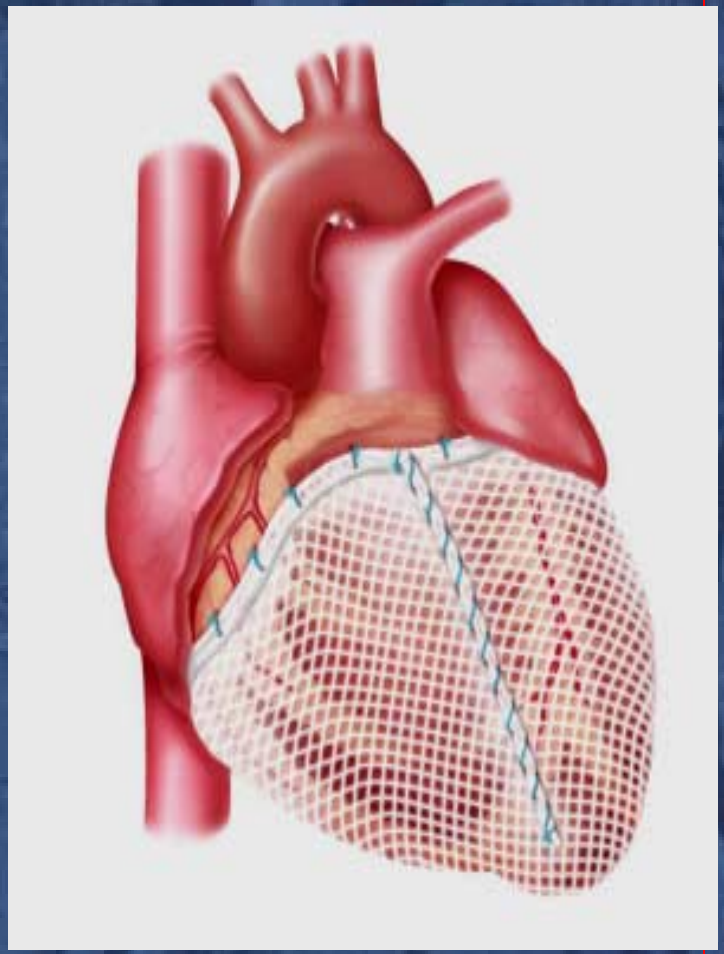
Myocor Device



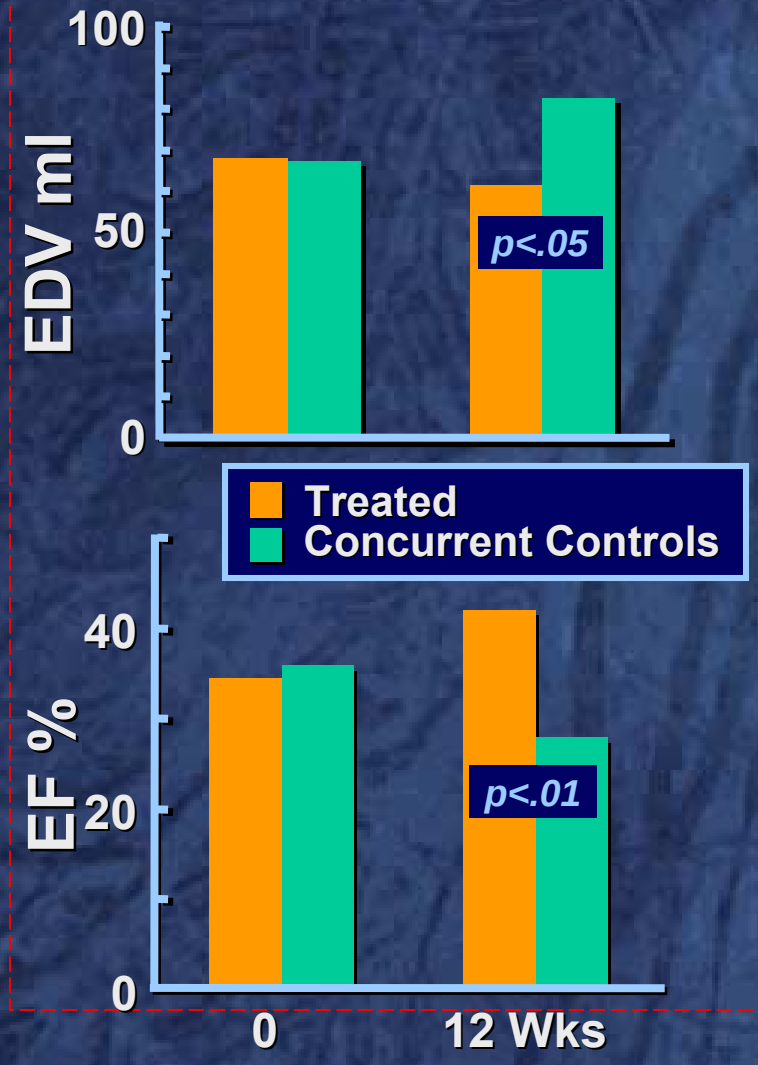
"Myosplinting" to reduce LV wall stress

Acorn

- **Global Effect**
  - *Reduces wall stress*
  - *Cellular Effect*
  - *Relieves myocyte stretch*
- **Molecular Effect**
  - *Downregulates adverse changes*



Acorn Pre-clinical Data



- Reduces volume
- Improves function
- Reverse remodeling
  - *Reduced stretch proteins*
  - *Less LVH*
  - *Improved contract / relax (calcium handling)*
  - *Decreased apoptosis*
  - *Less fibrosis*

Sabbah et al.; JACC, Feb 1999, 33(2): 207A.
Sabbah et al.; Circ 2000:102Sup;II-683
Saavedra et al.; Circ 2000:102 (Sup);II-501

Acorn Post-implant Changes

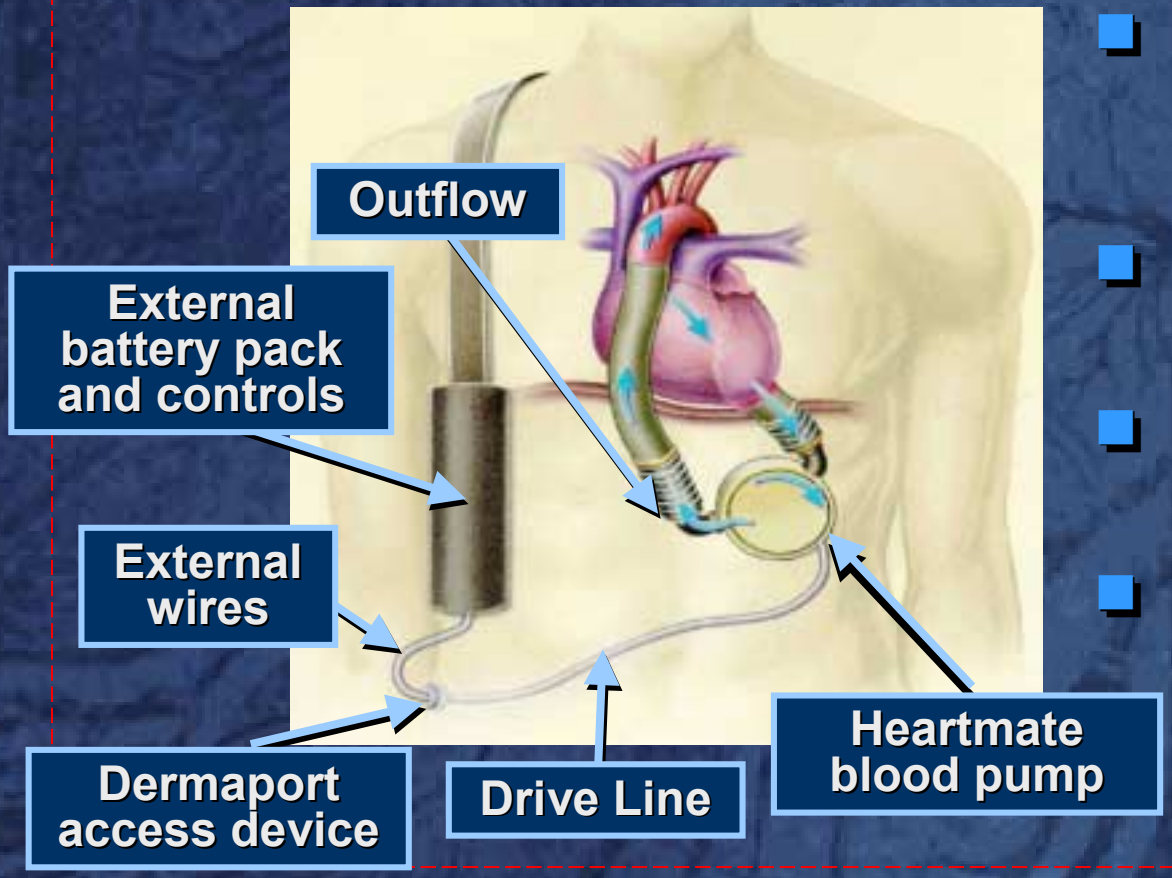
	Pre-Implant	12 Months
LVEDD mm *n=16*	74 ± 7	67 ± 7*
LVESD mm *n=14*	64 ± 8	56 ± 10*
LVEF % *n=16*	22 ± 9	31 ± 13*
MR 0 - 4+ *n=13*	2 ± 1	1 ± 1*
NYHA *n=16*	3 ± 0.5	2 ± 0.7*
MN Living with HF *n=13*	30 ± 18	24 ± 21*
Uniscale *n=8*	4 ± 2	6 ± 2*

No evidence for constriction or altered compliance

Konertz JACC 2001;37(Sup A): 143A Numbers rounded

Device Therapy

Implantable ventricular assist devices

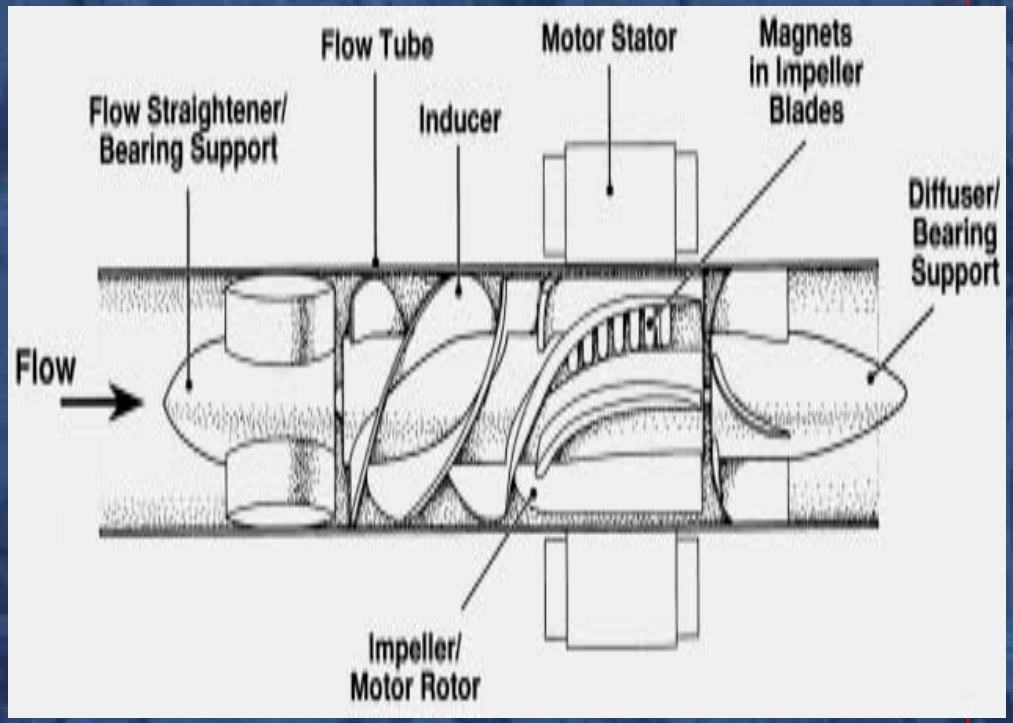


- Assumes work of failing ventricles
- Bridge to transplant
- Bridge to recovery
- Destination therapy

Next Generation Devices

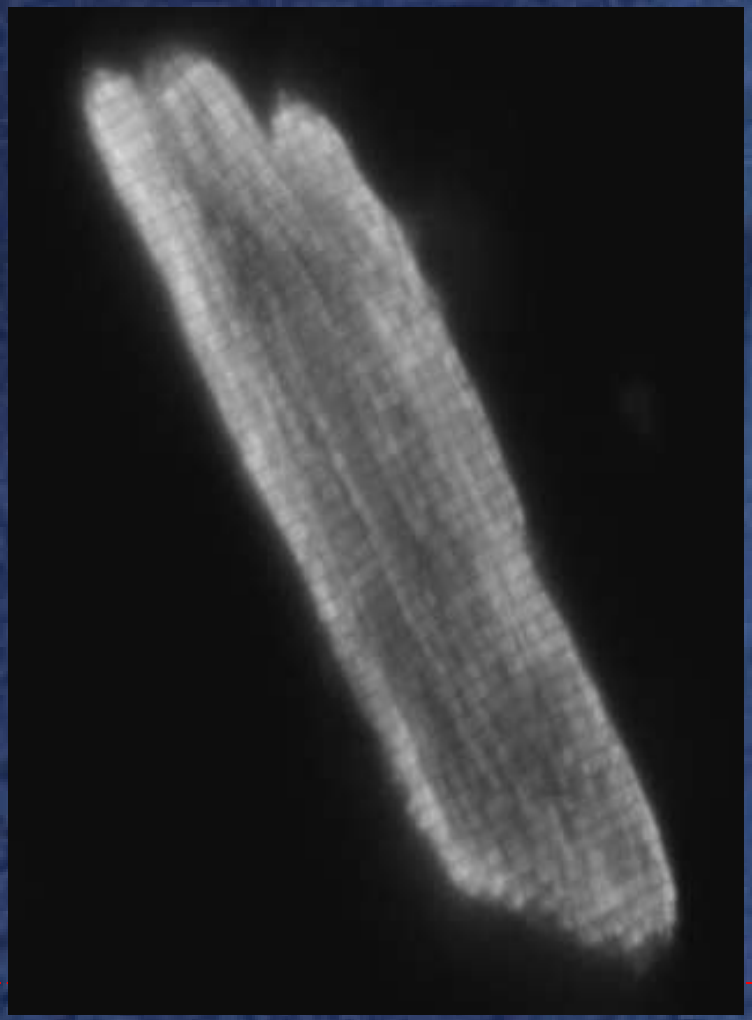
Emerging implantable assist systems

- HeartMate II
- Debakey/NASA
- Jarvik 2000
- Others



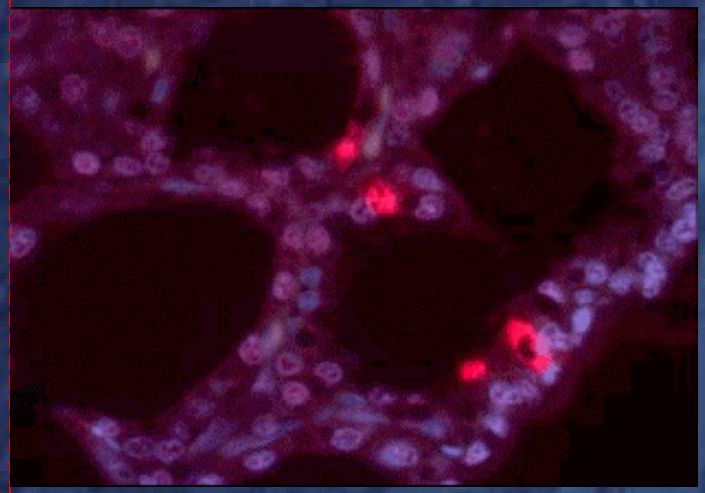
Axial flow mechanism

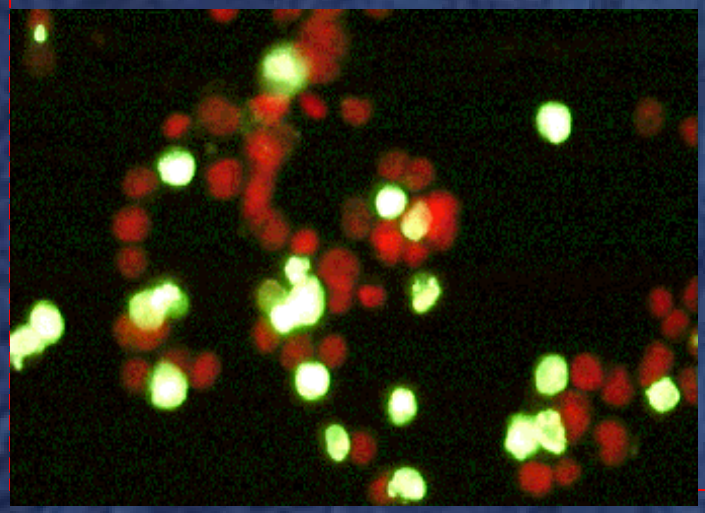
Cell Therapy



- Myoblast transplant
- Apoptotic inhibition

Gene Therapy





- Angiogenesis
- Growth factors
- Transfection problems

Heart Failure Surgery

Geometric therapy
Surgery to replace or *reshape* the LV

Device therapy
Bridge or permanent: *active remodeling*

Cell / gene therapy
Myocardial delivery: *passive remodeling*