

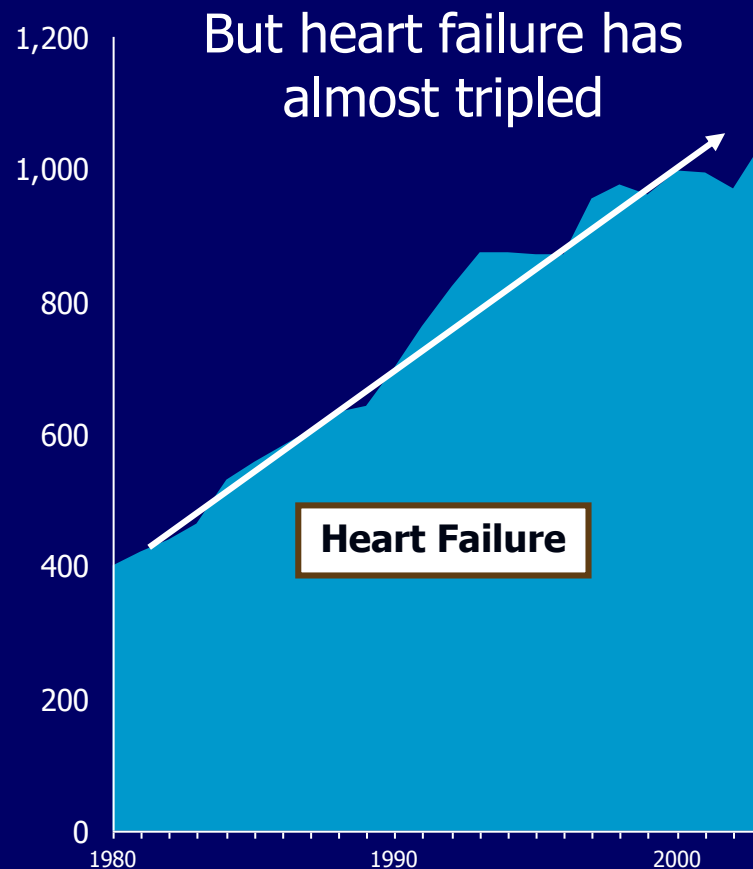
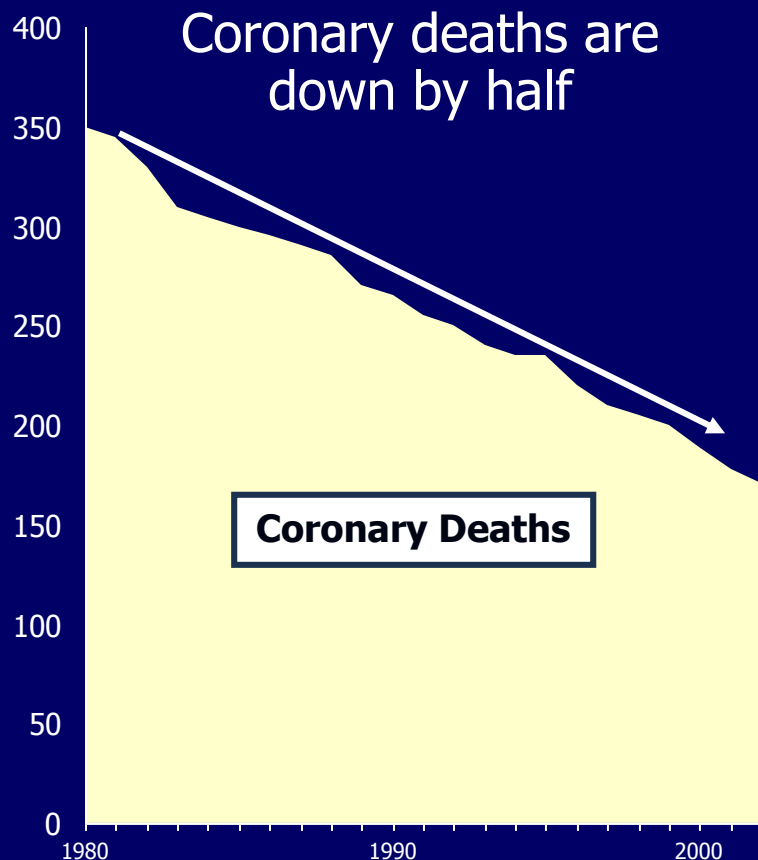
# **MANAGEMENT OF ADVANCED HEART FAILURE TODAY**

**Leslie W. Miller, MD**  
**Director of Heart Failure**  
**Morgan Heart Institute**

# Forward Looking Statement

- This presentation contains forward-looking statements. All forward-looking statements are management's present expectations of future events and are subject to a number of risks and uncertainties. Various factors could cause actual results to differ materially from these statements including timing, clinical enrollment, clinical results, financing availability, product sales and marketing or efficacy of products, and the other risks set forth under the caption "Risk Factors" and elsewhere in our periodic and other reports filed with the U.S. Securities and Exchange Commission, including our Annual Report on Form 10-K for the fiscal year ended December 31, 2014.
- Although the Company believes that the forward-looking statements are reasonable and based on information currently available, it can give no assurances that the Company's expectations are correct. All forward looking statements are expressly qualified in their entirety by this cautionary statement.
- Caution: C-Pulse<sup>®</sup> is an investigational device. The device is limited by federal (United States) law to investigational use only.
- C-Pulse is a registered trademark of Sunshine Heart Inc.

# Heart Failure versus Coronary Deaths



Consequence of our Success  
Need new technologies for chronic disease management

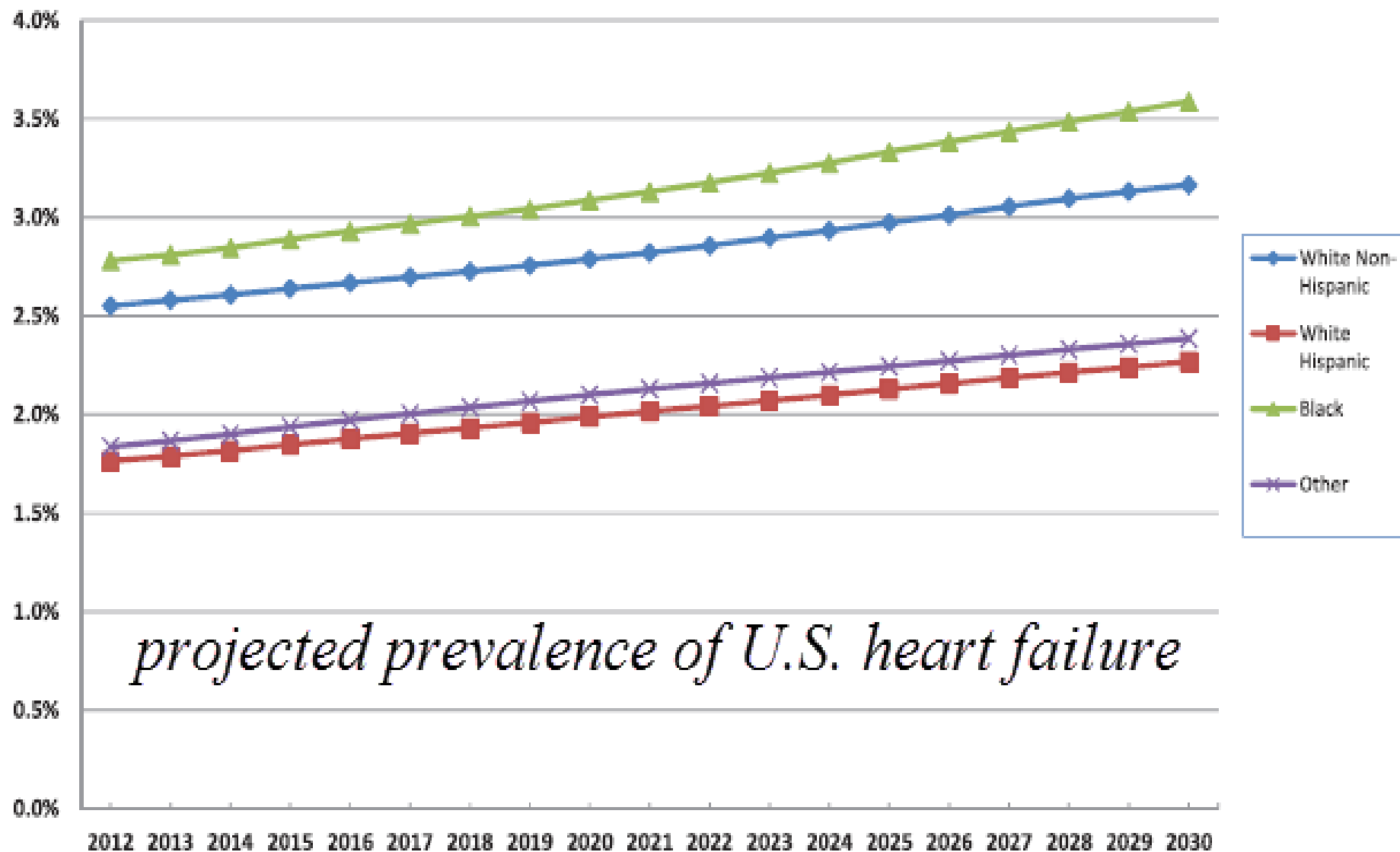
# Heart Failure Facts

---

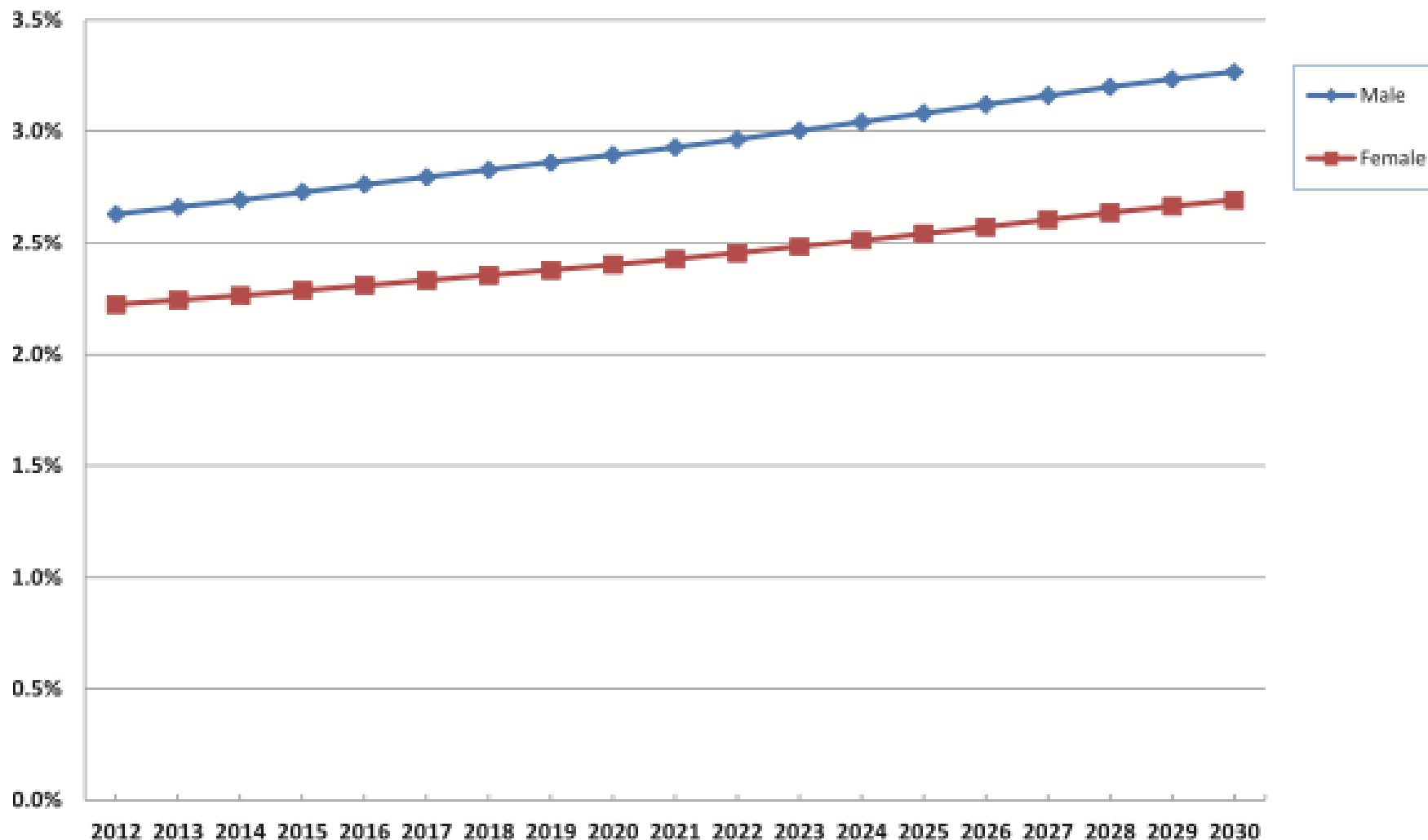
- Only form of CV disease increasing in Mortality
- > 7 million patients in U.S.; > 50% Systolic HF
- **> 800,000 New cases/year\*; One every 9 deaths\***
- Increase is due to advances-AMI\*, PCI, ICDs
- Epidemic of Obesity, Diabetes, HTN
- Prevalence: 7-10% people > 65 yrs of age (M=F)
- Population > 65 yr-double the incidence by 2030
- **NUMBER** Patients increase by 2025 to **> 10 M**

# AHA Policy Statement

## Forecasting the Impact of Heart Failure in the United States



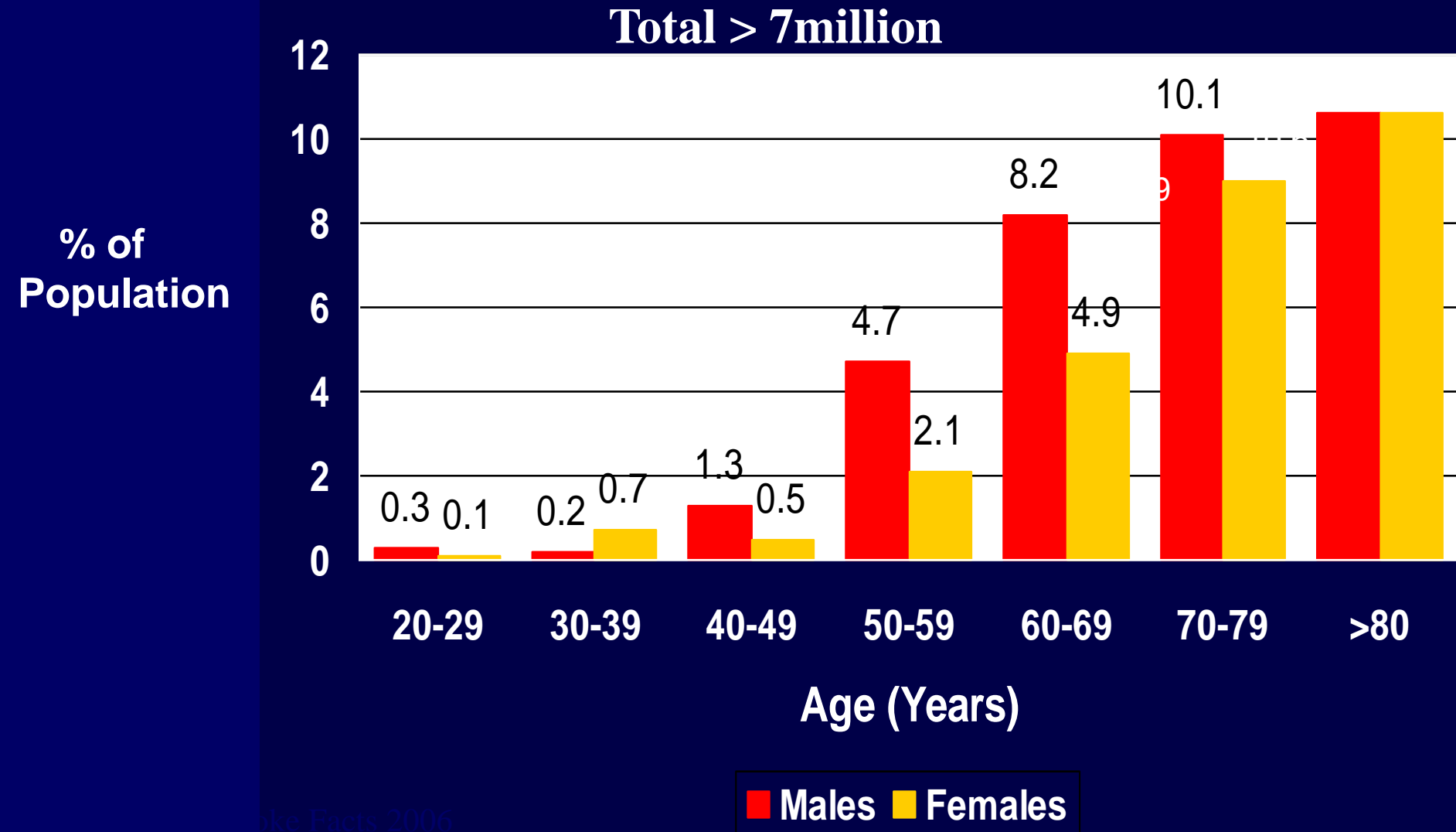
# MORTALITY BY GENDER WITH HEART FAILURE



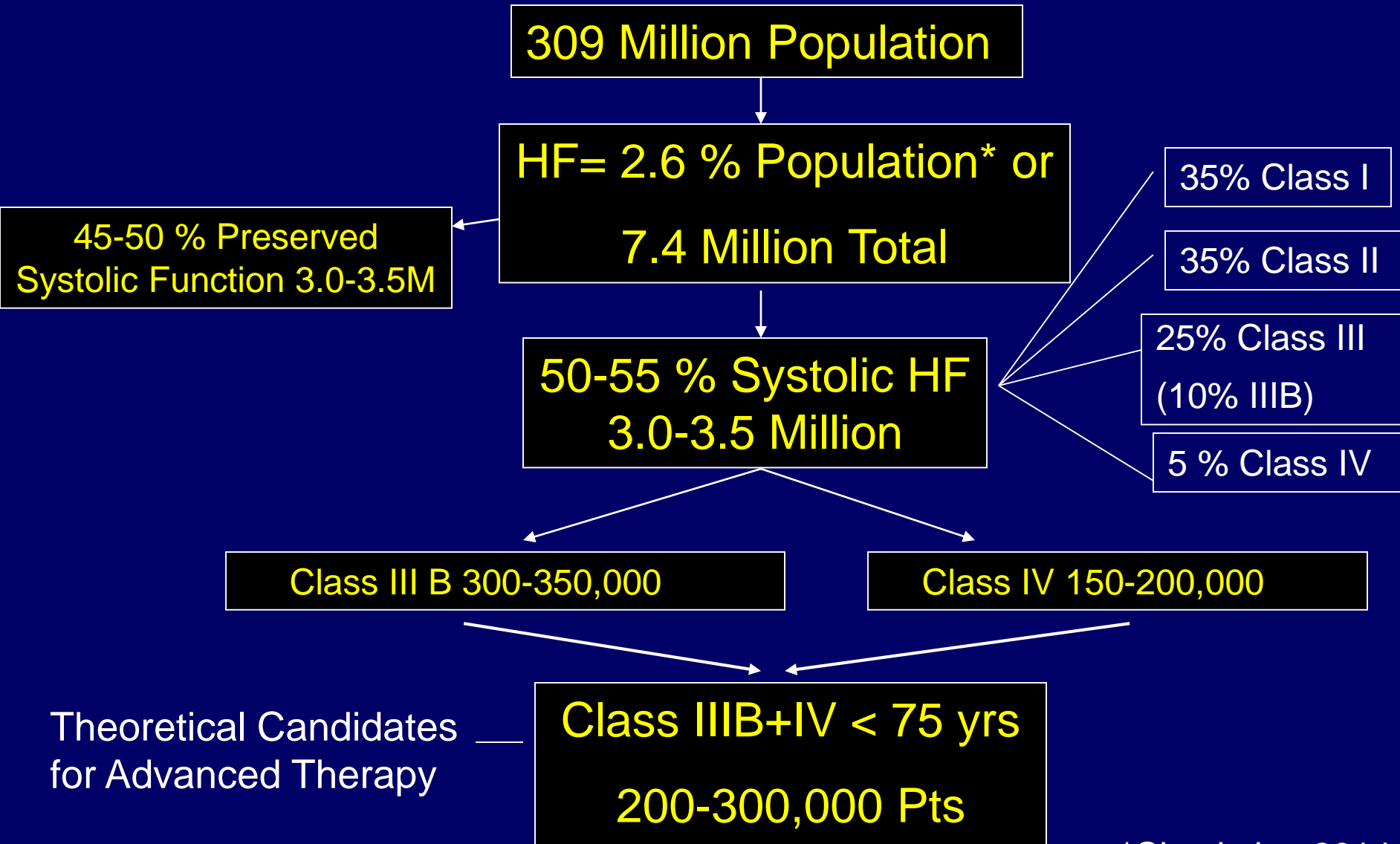
\* Heidenreich Circ HF 2013-AHA Forecast

# HEART FAILURE

## Estimated Prevalence by Age & Gender



# Current Estimate of Advanced HF Pts



\*Circulation 2014



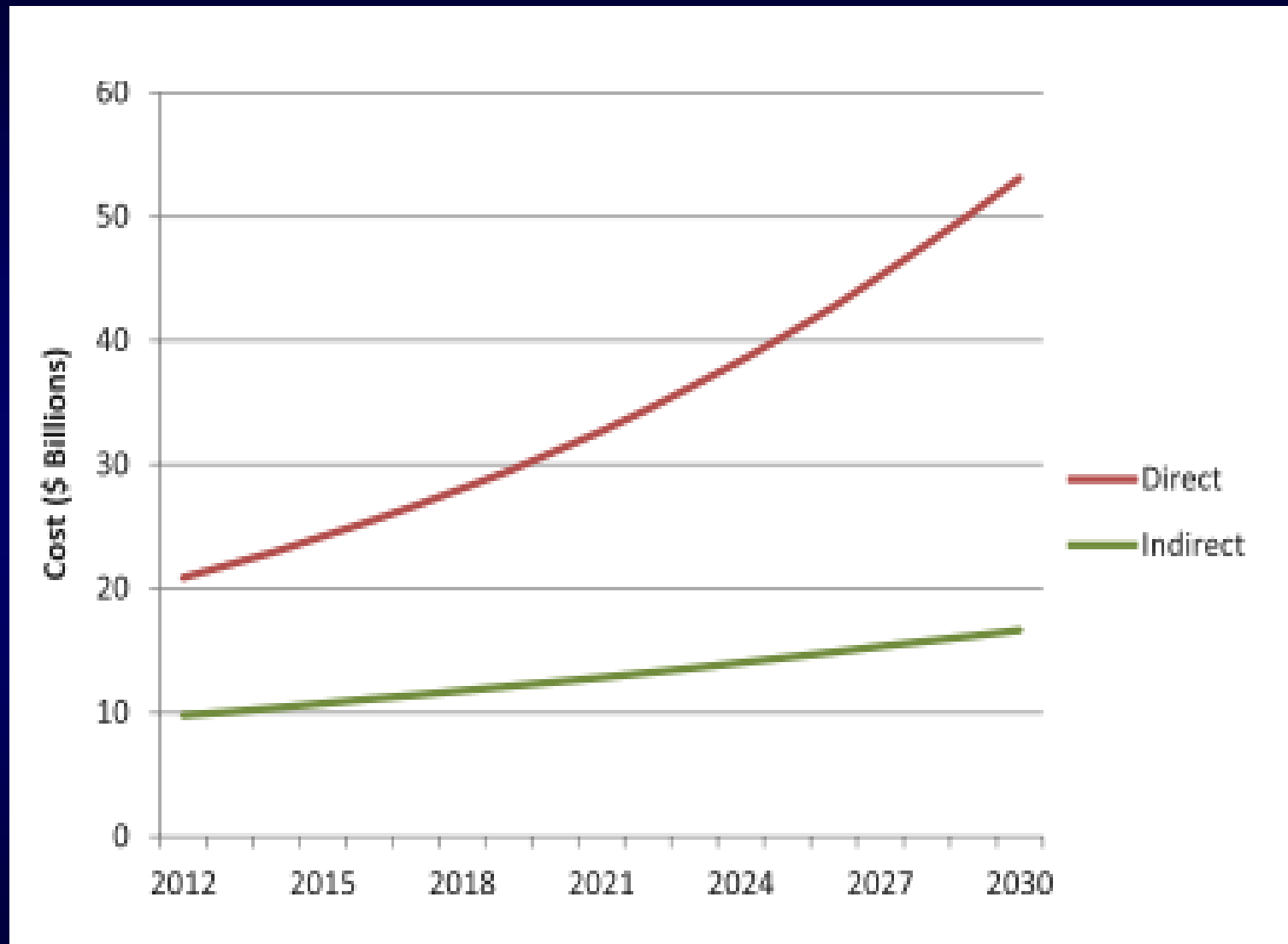
# Heart Failure Facts

---

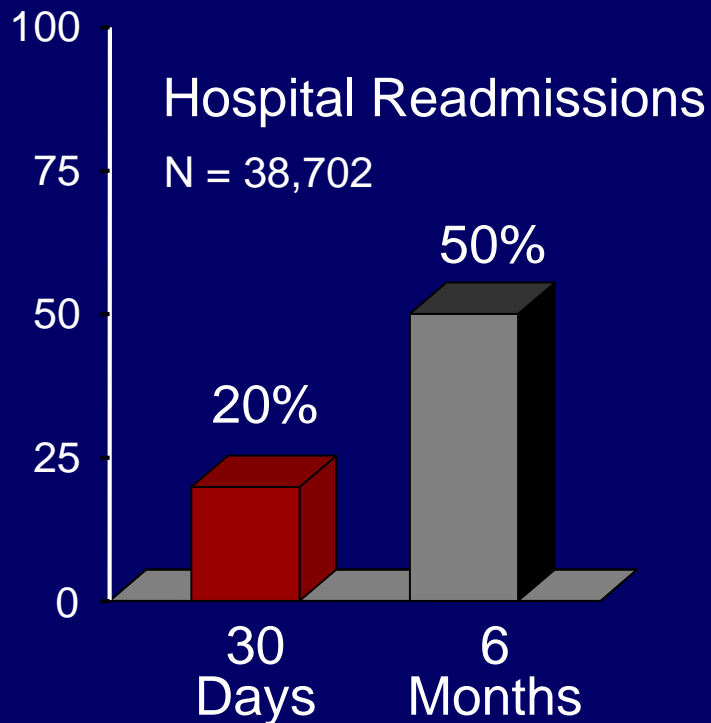
- Mortality > 60% at 5 yrs, worse by Class
- > 1 Million Hospitalizations/Yr (3 M as #2,3 Dx)
- **More Hosp days care HF than any other Dx**
- # 1 cause of readmission 30 days: 20-30%
- Loss of work impact > \$8 Billion
- **COST NOW: \$31 B ; COST 2030: \$ 70 Billion\***
- Mandate to find new more cost effective therapies

\* Heidenreich Circ HF 2013-AHA Forecast

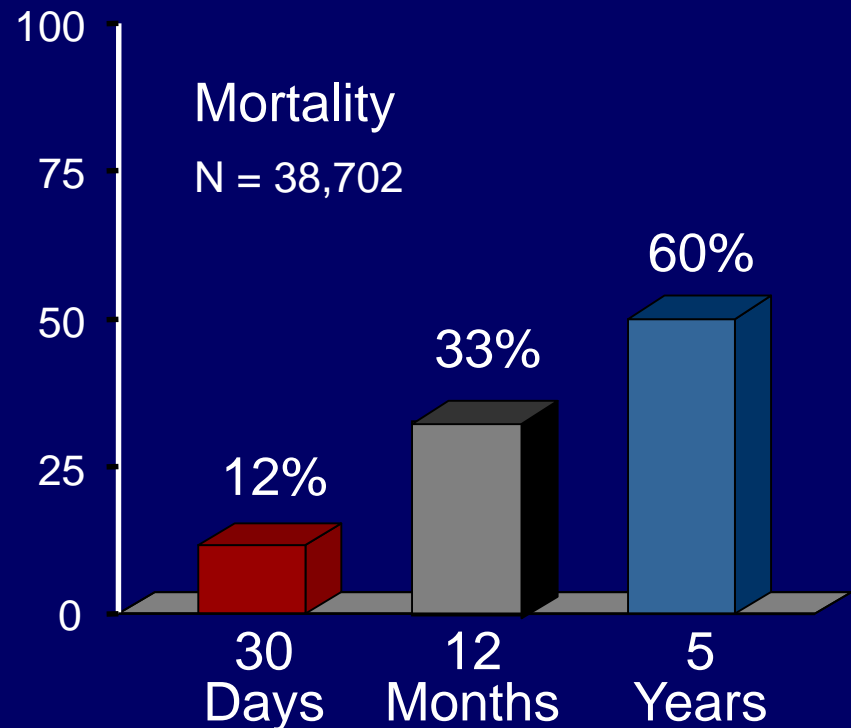
# PROJECTED INCREASE IN TOTAL COST OF HF CARE



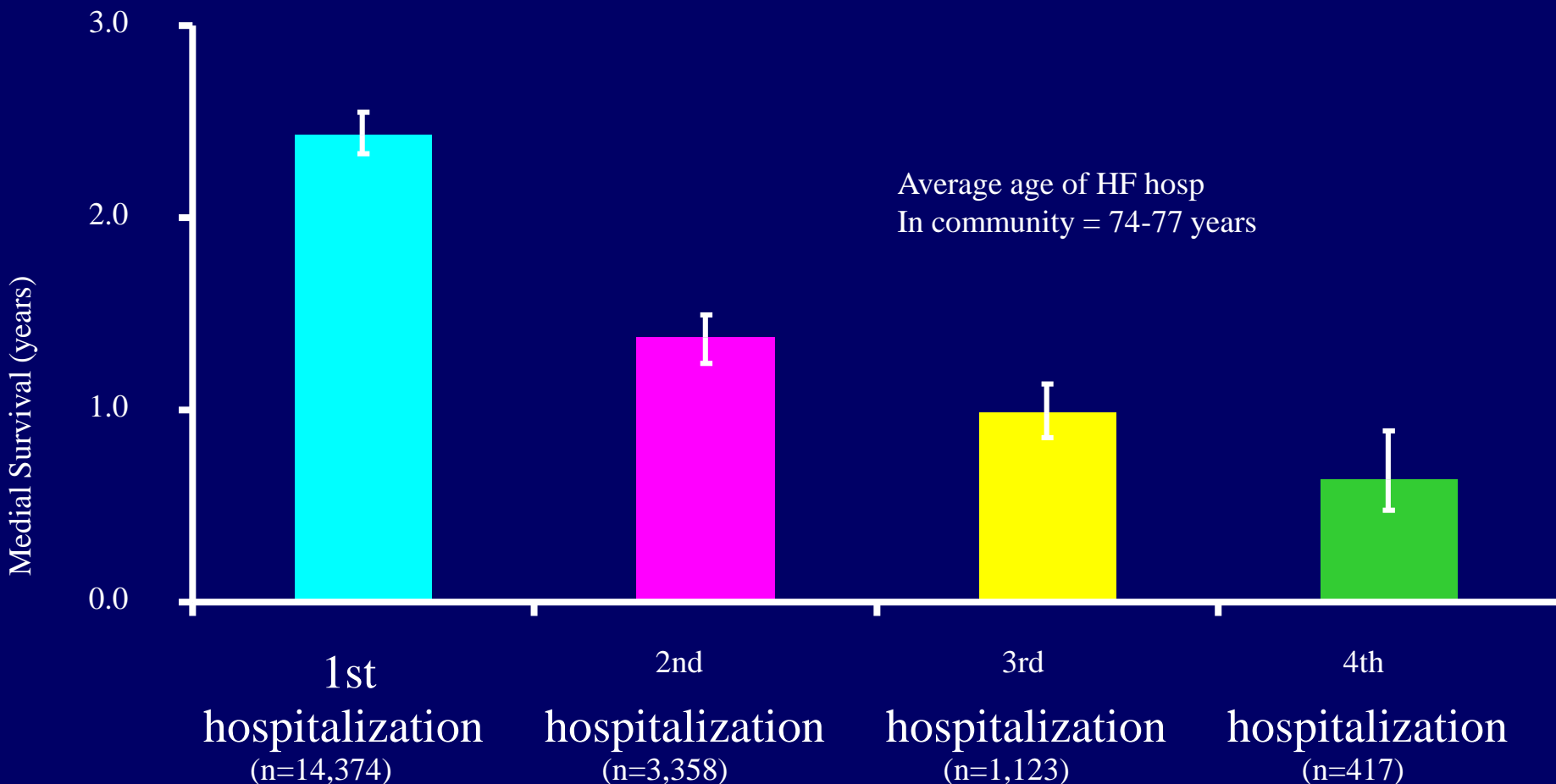
# Outcomes in Patients Hospitalized with Heart Failure



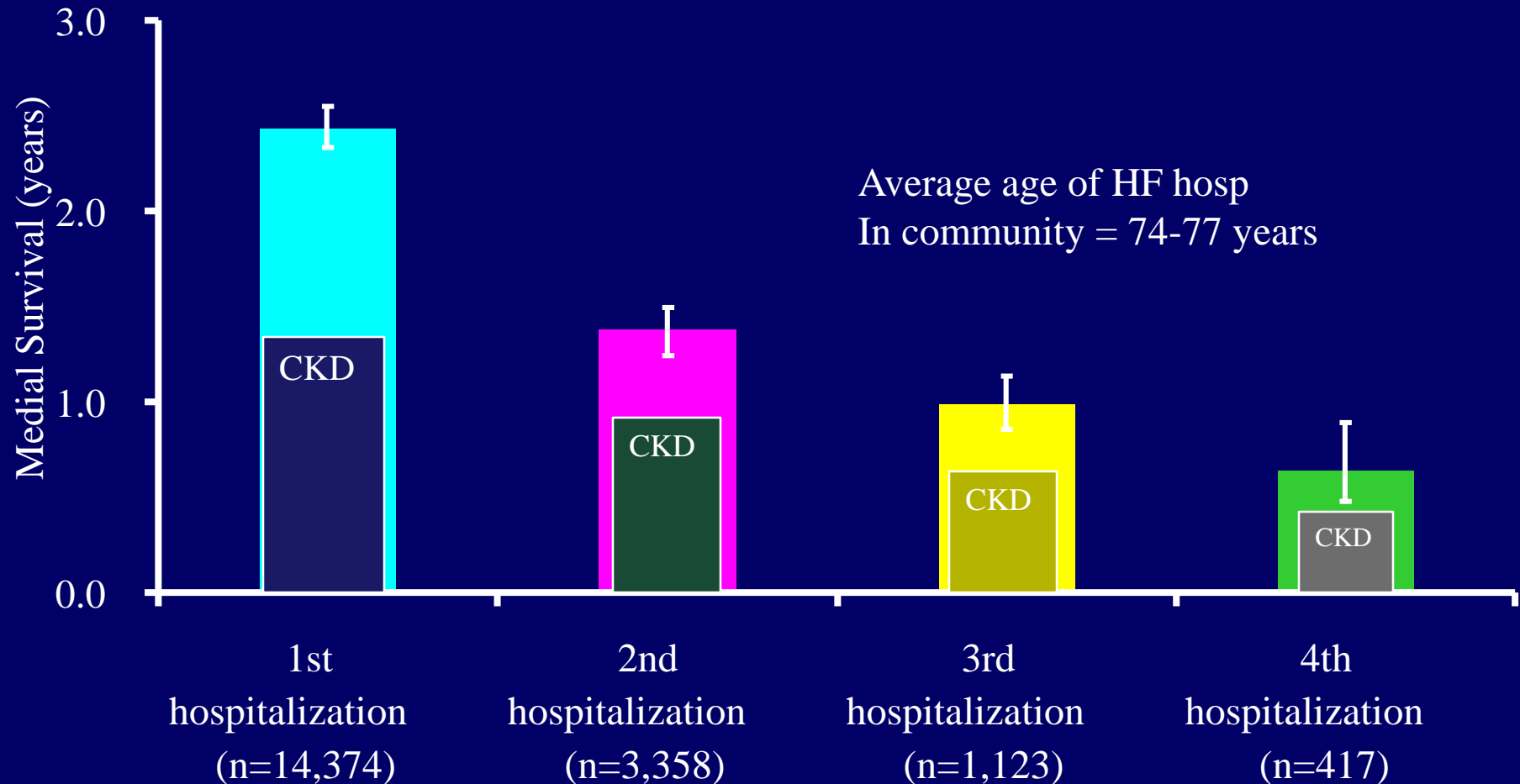
Median length of hospital stay: 6 days



# Median Survival Decreases Progressively after Each Hospitalization

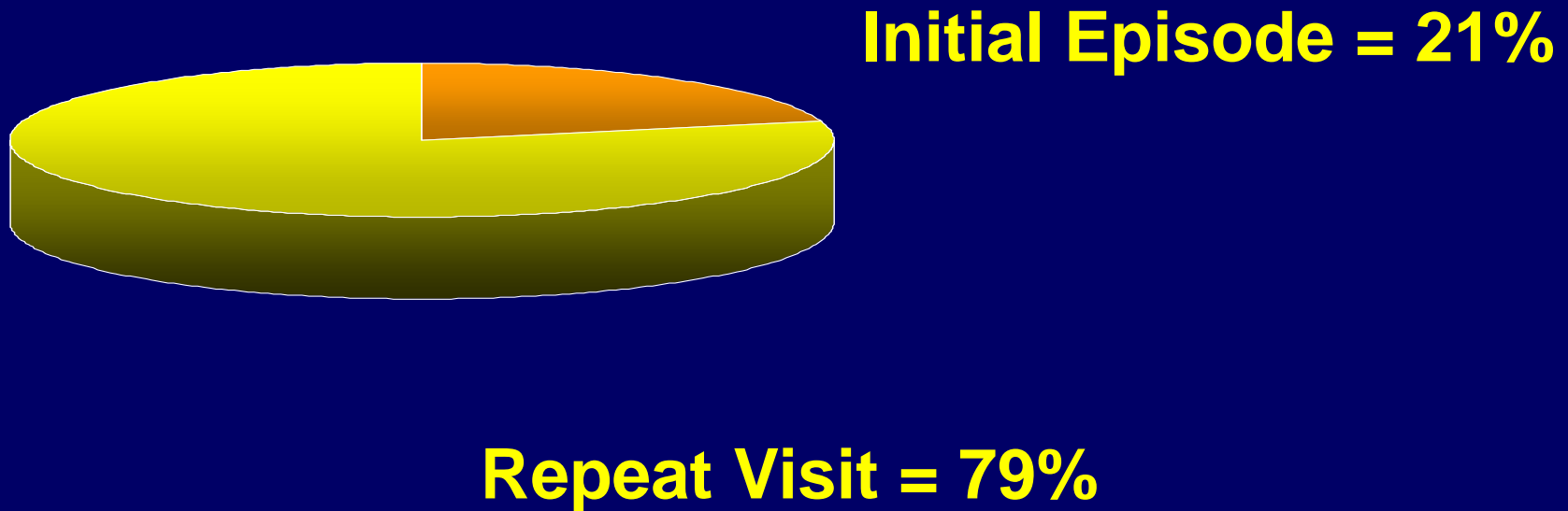


# Median Survival Decreases Progressively after Each Hospitalization Impact of Chronic Kidney Disease (CKD)



# Hospital Visits for Congestive Heart Failure

## Emergency Department Presentations



# **Failed In-Hospital Trials-ADHF**

---

- **DOSE-Diuretic dosing: IV infusion vs Bolus**
- **ASCEND- BNP vs Std Care**
- **DAD-HF: low dose Dopamine, high/low lasix**
- **PROTECT: Rolofyline vs std care**
- **CARRESS: Ultrafiltration**
- **RELAX: Seralaxin vs placebo**
- **ASTRONAUT: Aliskerin**
- **SMAC-HF: Hypertonic saline**

# Failed New Therapies for Heart Failure

---

- Intravenous Inotropes-Milrinone (OPTIME)
- Calcium Sensitizer Inotrope-Levosimendan (LIDO)
- Endothelin Receptor Antagonists (RITZ)
- BNP metabolism Neprolysin inhibitor (OVERTURE)
- Calcium Channel Blockers (PRAISE)
- TNF antibodies (RENAISSANCE)
- Brain Natriuretic Peptide (FUSION 3)
- Vasopressin Antagonist (Tolvaptan)
- Adenosine Receptor Antagonist (PROTECT)
- Angiotensin Receptor Block (Irbesartan) (I-PRESERVE)



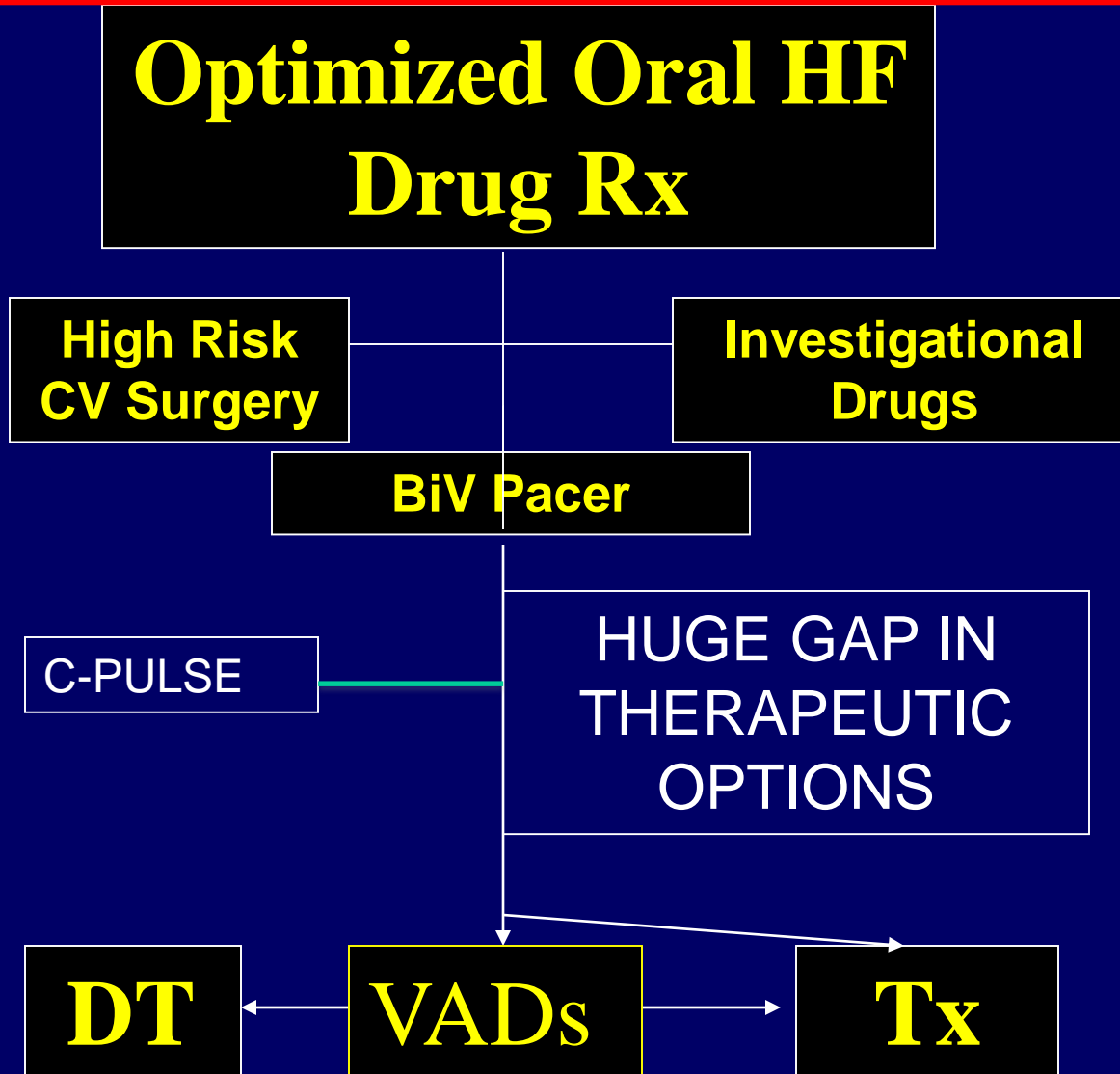
# New Drugs for Heart Failure

---

- **Entresto** : New combined ARB and BNP inhibitor VS ACEI
- PARADIGM Study\*: 8,000 patients
  - Reduced Mortality by 20%
  - Reduced Hospitalization by 20%
- Only 1 % were Class IV
- **Corlanor**: Designed to slow HF; only blocks ion channel
  - No effect on Mortality
  - Reduced Hospitalization by 23%
- Add on drug, Beta Blocker intolerant
- Only 1 % Class IV; 1% African Am


# Current Management of Advanced/End Stage HF

---



# WHY SUNSHINE HEART COUNTER-HF™

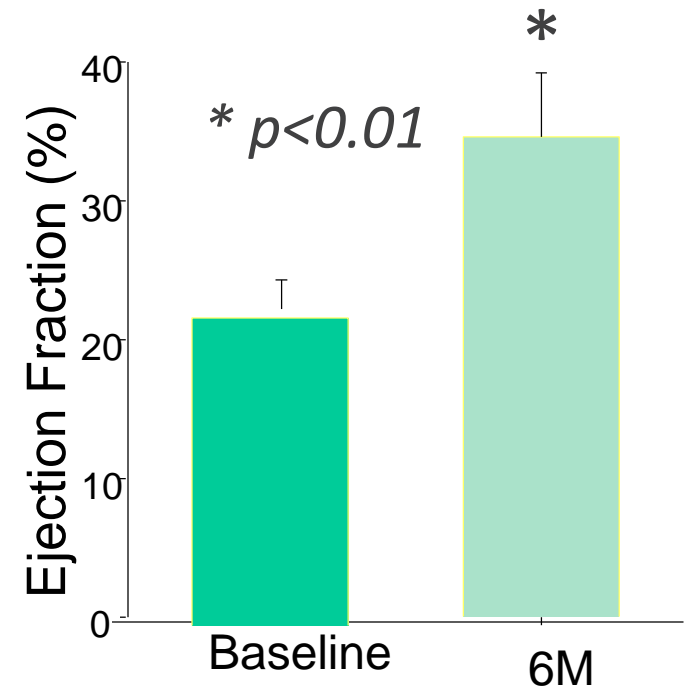
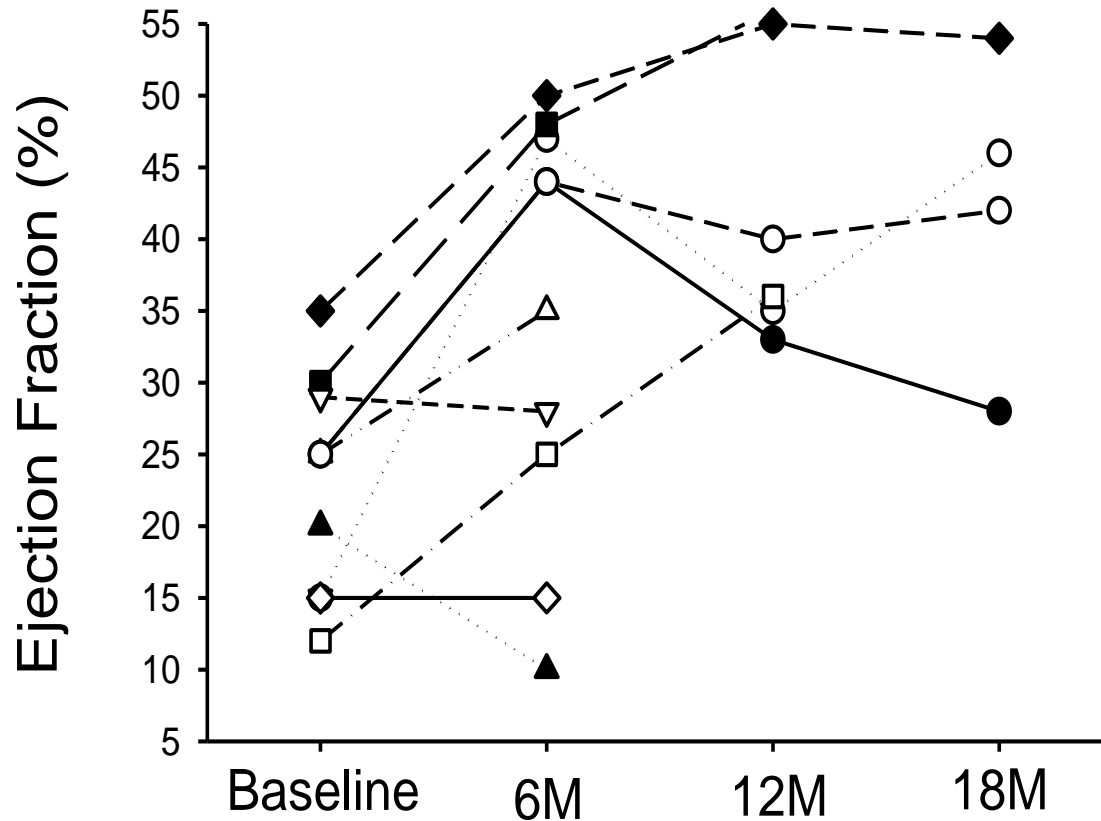
---

- Huge Gap in Therapeutic Options between optimized Medical Therapy/CRT  Ht Tx or large LVAD
- Implant is much less invasive compared to Tx/LVAD
- Multiple Mechanisms of benefit
- **Device can be safely stopped**-Relieve Anxiety of Risk
- Patient can SHOWER with drive line detached-**QOL**
- Modular design allows easy repair of drive line
- Moving to eliminating drive line

Caution: C-Pulse® is an investigational device. The device is limited by federal (United States) law to investigational use only.

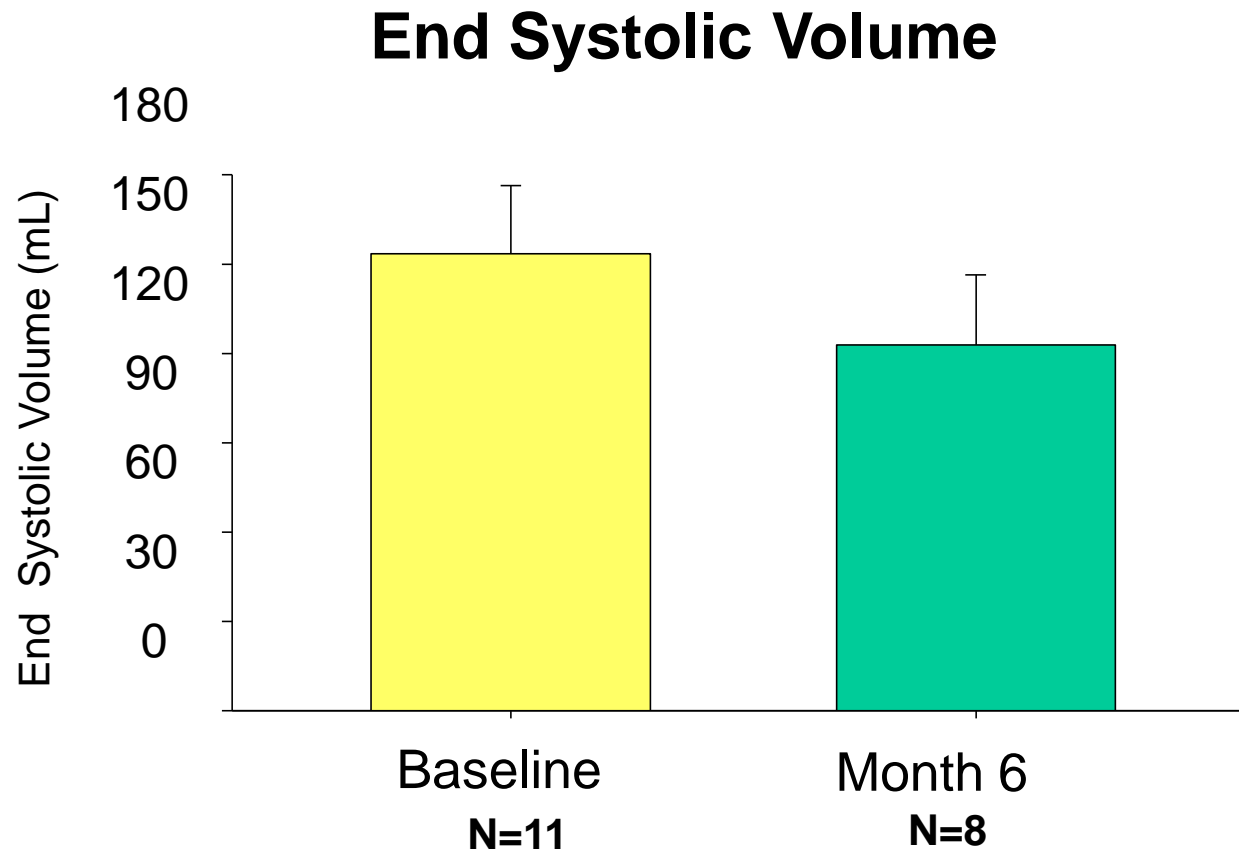
# Pilot Data-OPTIONS HF

## Improvement in Ejection Fraction



Caution: C-Pulse® is an investigational device. The device is limited by federal (United States) law to investigational use only.

# C- Pulse and Pilot Data In OPTIONS-HF Structural Remodeling

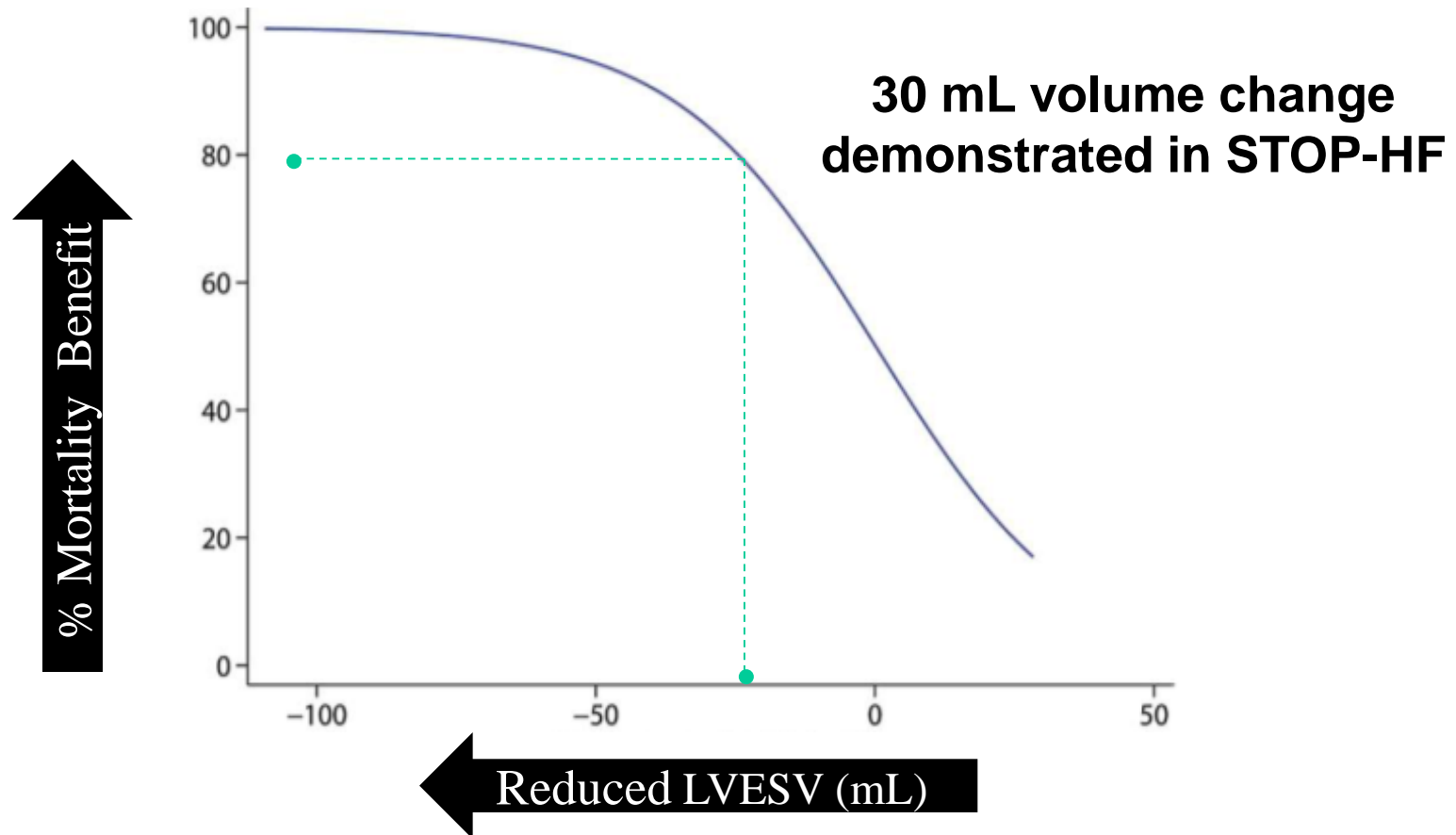


Caution: C-Pulse® is an investigational device. The device is limited by federal (United States) law to investigational use only.

*Sunshine Heart data on file*

# LVESV is Correlated with Mortality

## Meta Analysis of 30 trials\*



**Studies indicate that a 30 mL LVESV change correlates with ~80% improvement in mortality.**

# CURRENT LVAD PROBLEMS

---

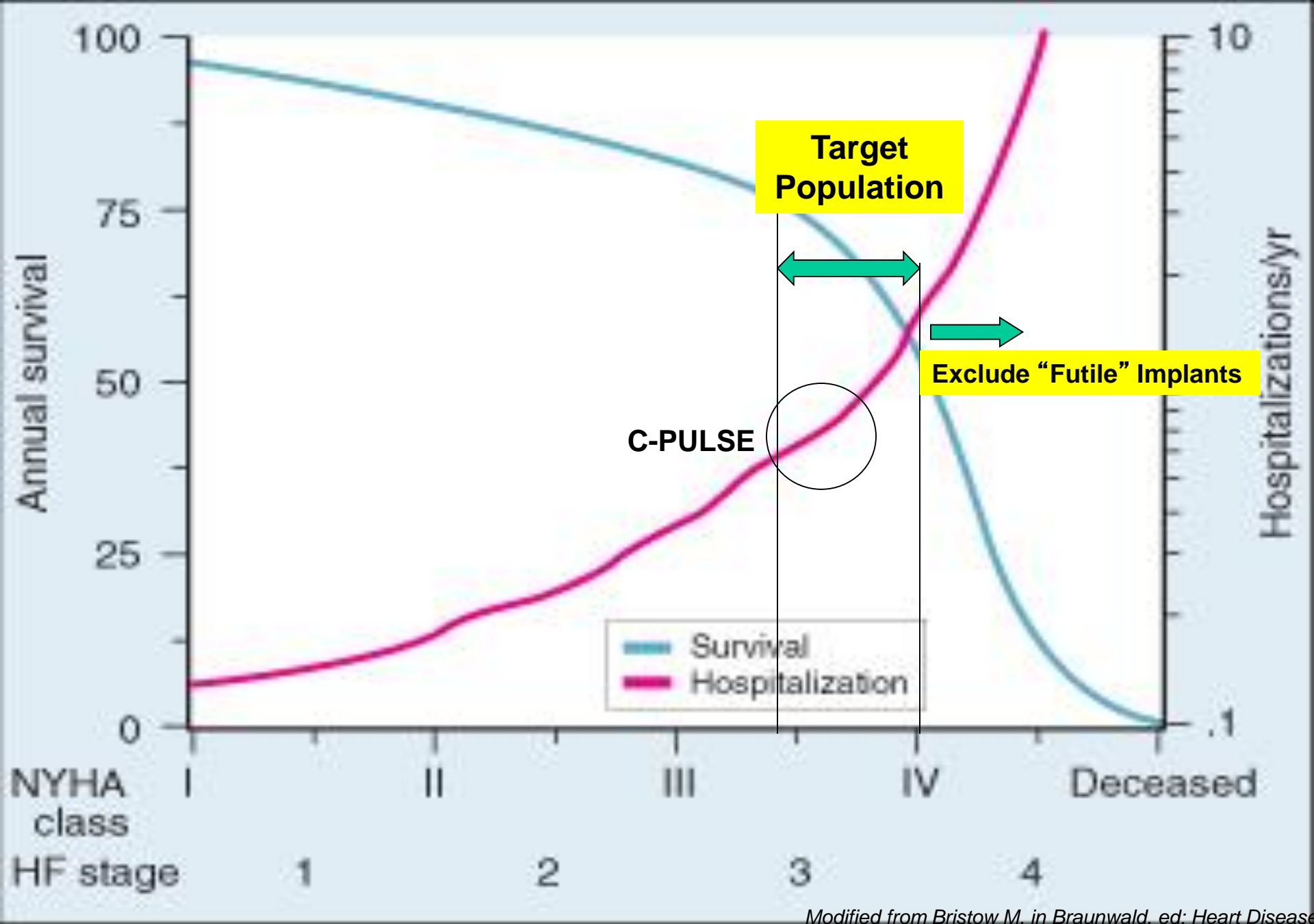
- **Significant advances in technology**
- **Cost is >\$150,000 just for index hospitalization**
- **READMISSION rate: Avg 2.6 admits first year**
- **GI Bleeding-main cause of readmission**
- **Stroke: 8-10%**
- **Device Thrombosis/Replacement**
- **Infection**

# RECOVERY

---

- **Holy Grail of any form of mechanical support**
- **Sufficient improvement to remove the device**
- **Limited success with today's chronic LVADs- 5-10%**
- **Explant and failure requires large Reoperation procedure**
- **If improvements seen in the short follow up with C-Pulse**
- **Persist or improve more, could lead to increased Recovery**
- **Goal is significant sustained improvement**
- **If HF returns, limited procedure to reinitiate therapy**





Modified from Bristow M, in Braunwald, ed: Heart Disease

# SUMMARY

---

- **Growth in Heart Failure is “At a Tipping Point”**
- **Rapid increase in those still symptomatic on Optimal MM**
- **Once hospitalized for HF, dramatic decline in Survival**
- **Cost of this expansion (hospitalizations) is not sustainable**
- **Clear need for effective new alternative to current Rx**
- **Pilot data from C-Pulse is very encouraging**
- **Sustainable Recovery would have enormous impact**
- **Design makes it much more attractive to patient**
- **COUNTER trial should enroll well**

Caution: C-Pulse<sup>®</sup> is an investigational device. The device is limited by federal (United States) law to investigational use only.

# STANDARDIZED CONSENT C-PULSE

---

- Trial enrollment is a critical component of success
- Enrollment varies between sites
- Significant Variability Consent Presentation
- New Approach: Create Scripted, Video-Taped Presentation of study and details-
- Allows uniform and “ideal” presentation as many times as patient needs and subsequent questions addressed
- FDA. Sponsor, PI, and Patient ALL Advantaged