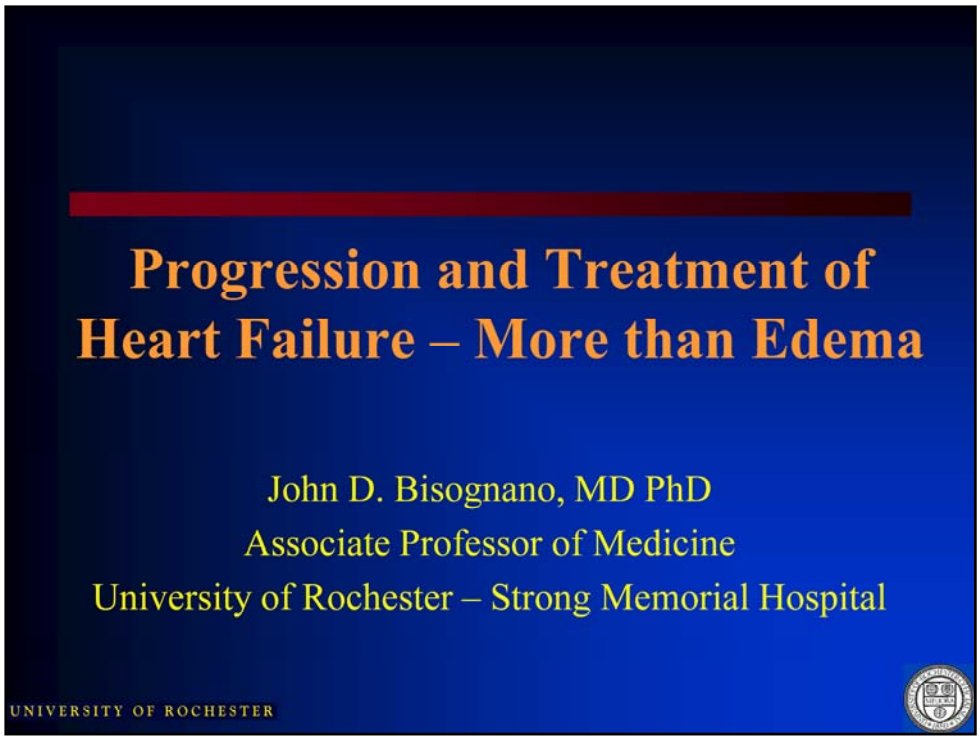
Progression and Treatment of Heart Failure – More than Edema
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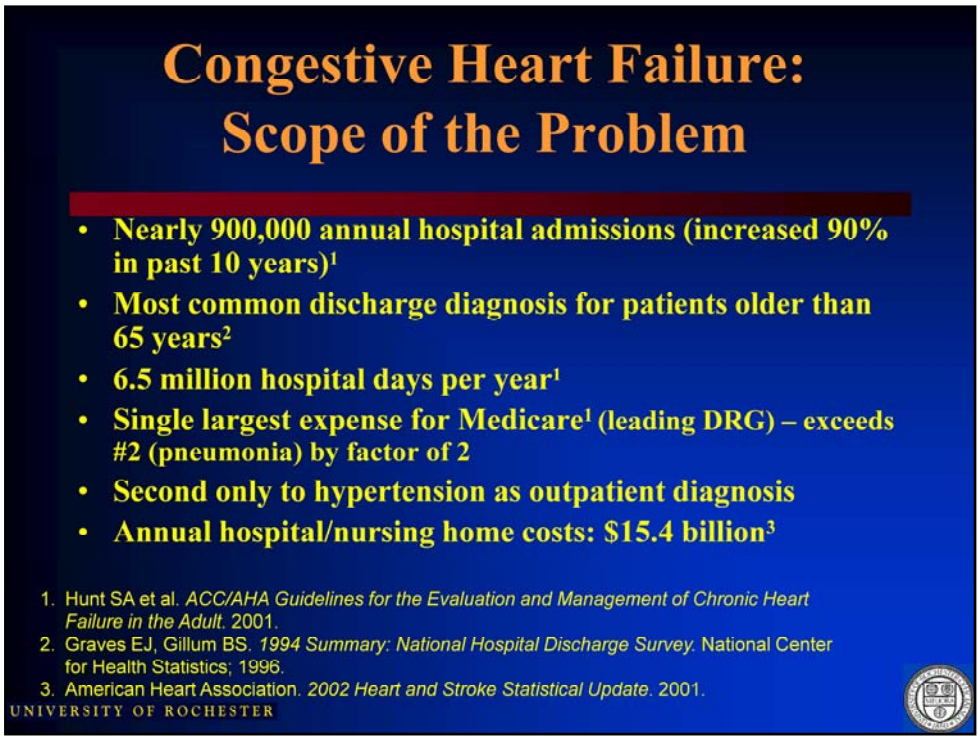
Success in Treatment

- 1975: A nice diuresis.
- 2008: Extension of Life Expectancy, decreased hospitalization.
- Therapies include lifestyle, drugs, transplant, devices.

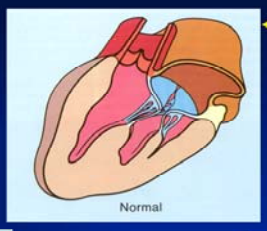


Congestive heart failure (CHF) afflicts nearly 5 million persons in the United States. An estimated 550,000 new cases of heart failure are diagnosed annually.[1] Roughly equal numbers of men and women have CHF. The incidence of heart failure is approximately 1 per 100 for persons older than 65 years.[2] Heart failure results in a tremendous economic burden. CHF now represents the most common discharge diagnosis in patients older than 65 years.[3] The prognosis of this condition in the absence of optimal treatment remains poor. Only 50% of CHF patients survive for 5 years after diagnosis.[4]

References:

1. Hunt SA, Baker DW, Chin MH, et al. *ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines.* 2001. American College of Cardiology Web site. Available at: http://acc.org/clinical/guidelines/failure/hf_index.htm. Accessed December 2002.
2. American Heart Association. *2002 Heart and Stroke Statistical Update.* Dallas, TX: American Heart Association; 2001.
3. Graves EJ, Gillum BS. *1994 Summary: National Hospital Discharge Survey: Advance Data From Vital and Health Statistics.* No. 278. Hyattsville, MD: National Center for Health Statistics; 1996.
4. Dargie HJ, McMurray JJ, McDonagh TA. Heart failure—implications of the true size of the problem. *J Intern Med.* 1996;239:309–315.

Two Types of Heart Failure

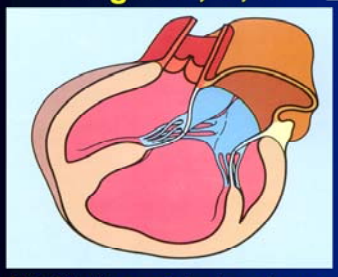


Stage A

Dilated cardiomyopathy

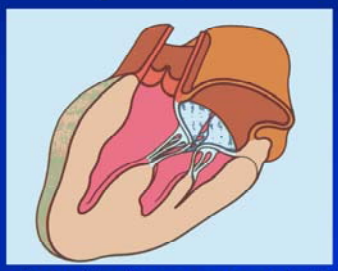
Hypertensive or diabetic heart disease

Stages B, C, D



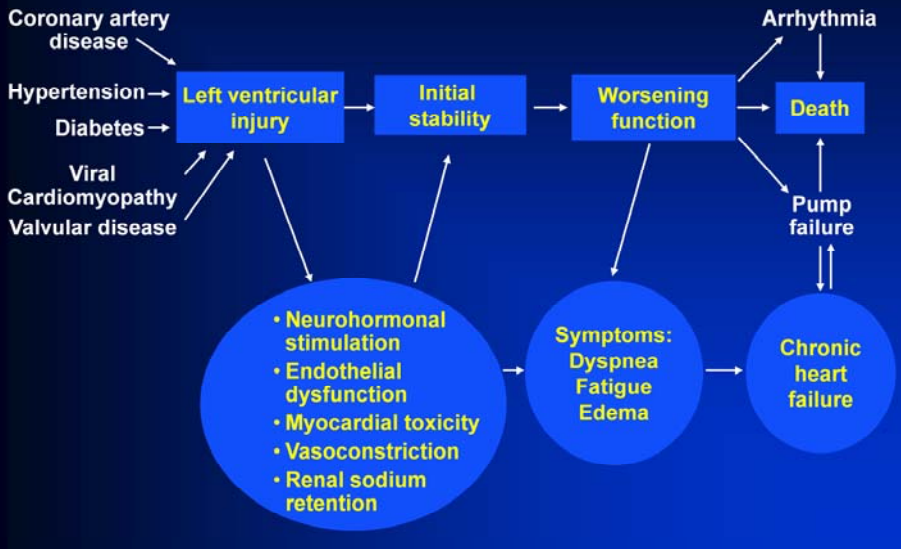
LV dilation, globular shape
Systolic LV dysfunction
Mitral regurgitation

Stages B, C, D



Normal cavity size, concentric LVH
Diastolic dysfunction
Enlarged left atrium

Progression of Heart Failure



Adapted from Cohn JN. *N Engl J Med*. 1996;335:490–498.

ACE Inhibition in Heart Failure

Consensus Recommendations

- **All patients with heart failure due to left ventricular systolic dysfunction should receive an ACE inhibitor unless they have a contraindication to its use or cannot tolerate treatment with the drug**
- **Treatment with an ACE inhibitor should not be delayed until the patient is found to be resistant to treatment with other drugs**

Steering Committee and Membership of the Advisory Council to Improve Outcomes Nationwide in Heart Failure. *Am J Cardiol.* 1999;83(suppl 2A):1A–39A.

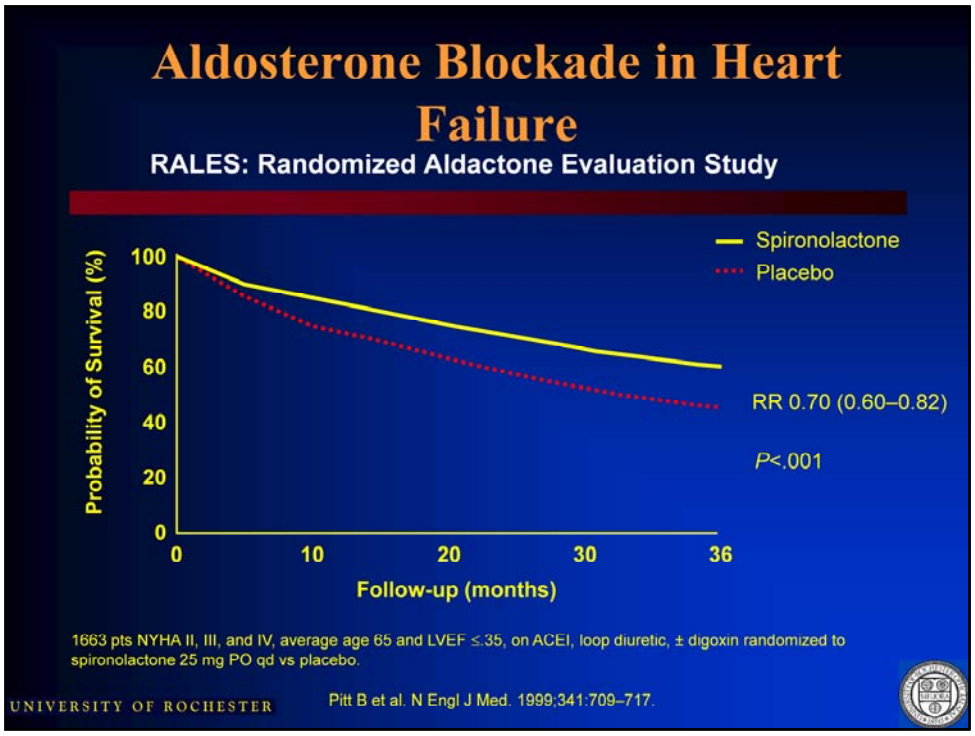
Adverse Consequences of Catecholamines

- Promote cardiac remodeling
- Direct toxic effects on cardiac myocytes
- Alteration of adrenergic signal transduction
- Arrhythmogenic effect, tachycardia
- Activate the renin-angiotensin system
- Increased endothelin
- Promote renal sodium and water retention
- Produce arterial and venous vasoconstriction

Dosing for β-Blockers in Heart Failure

Drug	Starting Dosage	Target Dosage
Carvedilol	3.125 mg bid	6.25 to 25 mg bid
Metoprolol CR/XL	12.5 to 25 mg qd	200 mg qd

Adapted from *The Medical Letter*, June 26, 2000.



Slide 34

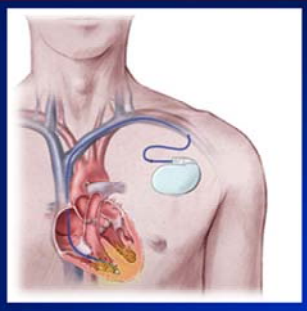
The production of aldosterone is only incompletely suppressed by ACE inhibitor therapy. Aldosterone also is released in response to serum potassium, corticotropin, and atrial natriuretic peptide. Aldosterone promotes myocardial and vascular fibrosis and has a number of other deleterious effects in heart failure.

The Randomized Aldactone Evaluation Study (RALES) was designed to determine if the aldosterone antagonist, spironolactone, when added to standard heart failure therapy would improve prognosis in patients with severe heart failure. The trial randomized 1663 patients with LVEF $\leq$ 35% with NYHA Class IV heart failure in the prior 6 months. All patients were treated with an ACE inhibitor and loop diuretic.

At 36 months, mortality in the spironolactone treatment arm of the RALES trial was significantly less than that in the placebo arm, representing a relative reduction of 30% (relative risk 0.70, 95% CI, 0.60 to 0.82; $P<0.0001$). There were 30% fewer hospitalizations for any cardiovascular cause ($P<0.001$). These benefits were achieved without a significant increase in the risk of serious hyperkalemia.

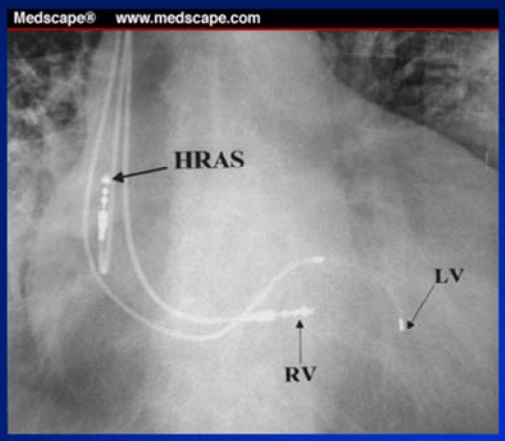
Treating 1000 heart failure patients with spironolactone for one year would prevent 52 deaths and 125 cardiovascular hospitalizations.

Implantable Defibrillator



Biventricular Pacing

http://www.chfpatients.com/implants/pacemakers.htm



Ischemic Evaluation

- Coronary Arteriography
- Stress testing in low-risk patients
- Laboratory exam : TSH, RAS
- Echocardiography
  - Valvular disease
  - Hypertrophic Cardiomyopathy
  - Pericardial disease
  - Infiltrative disease
    - Sarcoidosis, Amyloidosis, Hemachromatosis

Therapies

- Ischemia
  - Medical therapy
  - Percutaneous coronary intervention
  - Surgical bypass

Structural

- Dor procedure
- Valve repair and/or replacement
- Pericardial stripping

Approach to the Ischemic

- Intensive drug therapy
  - ACEI/ARB
  - Beta blockade
  - Spironolactone/Eplerenone
  - Statin
  - Clopidogrel/Aspirin
- Rehabilitation therapy
- Electrical therapy
  - AICD, BiVentricular pacer

The NonIschemic

- Intensive drug therapy
  - Ace/ARB
  - Beta blockade
  - Spironolactone
  - Statin maybe

  - Electrical therapy
  - Sleep Apnea; right sided failure

  - Diastolic Failure—Is this a systemic disease?

HF with Preserved Systolic Function

- This is really diastolic failure, right?
- Fluid Balance
- Preload
- Hypertension Control
- Diabetes Control
- Overall Preventive Strategy

Hospice?

- Recognize the heart failure is America's leading cause of death
- 20/20 (20% annual mortality with EF 20%)
- Identify what you are trying to accomplish (I.e. "What's the point?").

Feeling Better, Staying Out of the Hospital

- **Digoxin**
  - **Decreases hospitalizations**
  - **Patients feel better**
  - **Probably no mortality benefit. "*As good as placebo and almost as safe" (but maybe not in females)***
- **Diuretics**
  - **Furosemide is mainstay. Torsemide is generic too. Do not over-diurese and lose opportunity to use life-extending drugs**

LVAD (HeartMate®)

- Implanted pump restores circulatory support
- Extensive experience and incremental improvement with bridge-to-transplant in more than 3,400 patients since 1986

REMATCH

Randomized **E**valuation of **M**echanical **A**ssistance for the **T**reatment of **C**ongestive **H**eart Failure

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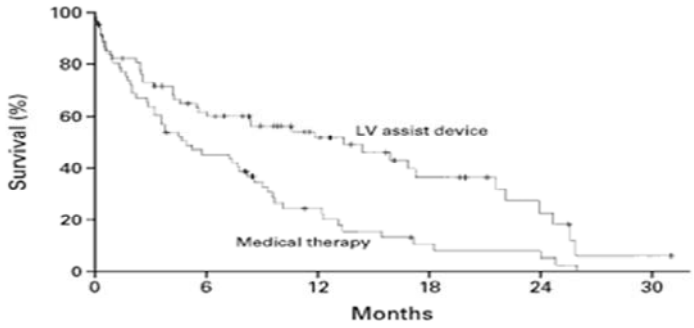
LONG-TERM USE OF A LEFT VENTRICULAR ASSIST DEVICE FOR END-STAGE HEART FAILURE

ERIC A. ROSE, M.D., ANNETINE C. GELIJNS, PH.D., ALAN J. MOSKOWITZ, M.D., DANIEL F. HEITJAN, PH.D., LYNNE W. STEVENSON, M.D., WALTER DEMBITSKY, M.D., JAMES W. LONG, M.D., PH.D., DEBORAH D. ASCHEIM, M.D., ANITA R. TIERNEY, M.P.H., RONALD G. LEVITAN, M.SC., JOHN T. WATSON, PH.D., AND PAUL MEIER, PH.D., FOR THE RANDOMIZED EVALUATION OF MECHANICAL ASSISTANCE FOR THE TREATMENT OF CONGESTIVE HEART FAILURE (REMATCH) STUDY GROUP*

UNIVERSITY OF ROCHESTER

Rematch Trial



No. at Risk						
LV assist device	68	38	22	11	5	1
Medical therapy	61	27	11	4	3	0

Success in Treatment

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- 2008: Extension of Life Expectancy, decreased hospitalization.
- Therapies include lifestyle, drugs, transplant, devices.