Current Approaches for Heart Failure Management

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Director, Heart Failure Institute
Medical Director Heart Transplant and
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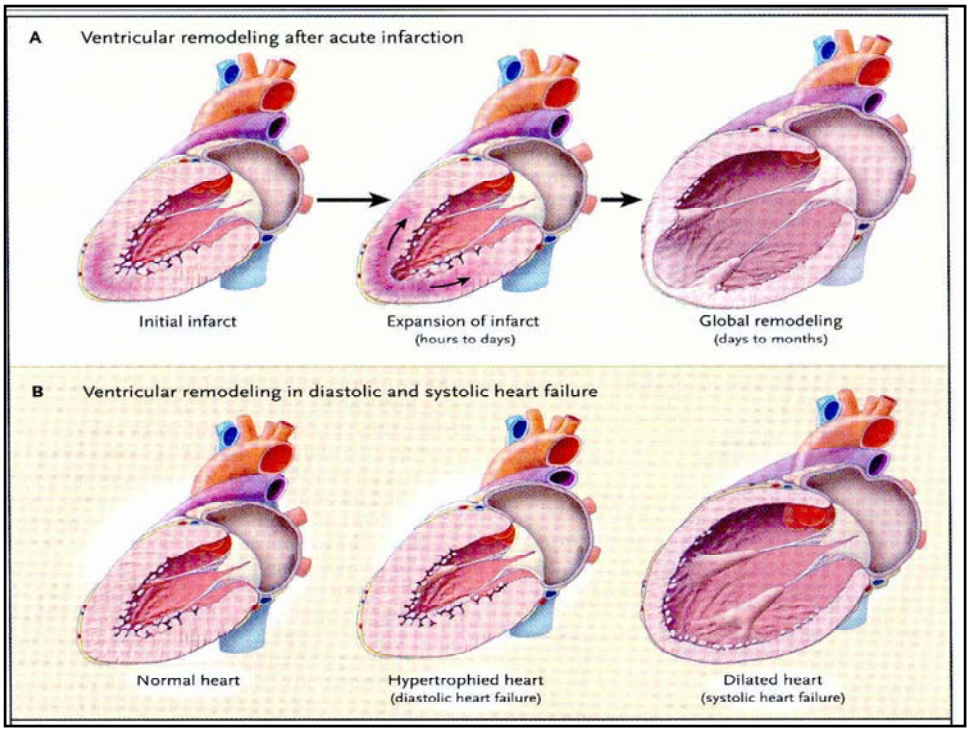
Advocate Christ Medical Center
Systemwide Physician Leader, Heart Failure
Advocate Healthcare

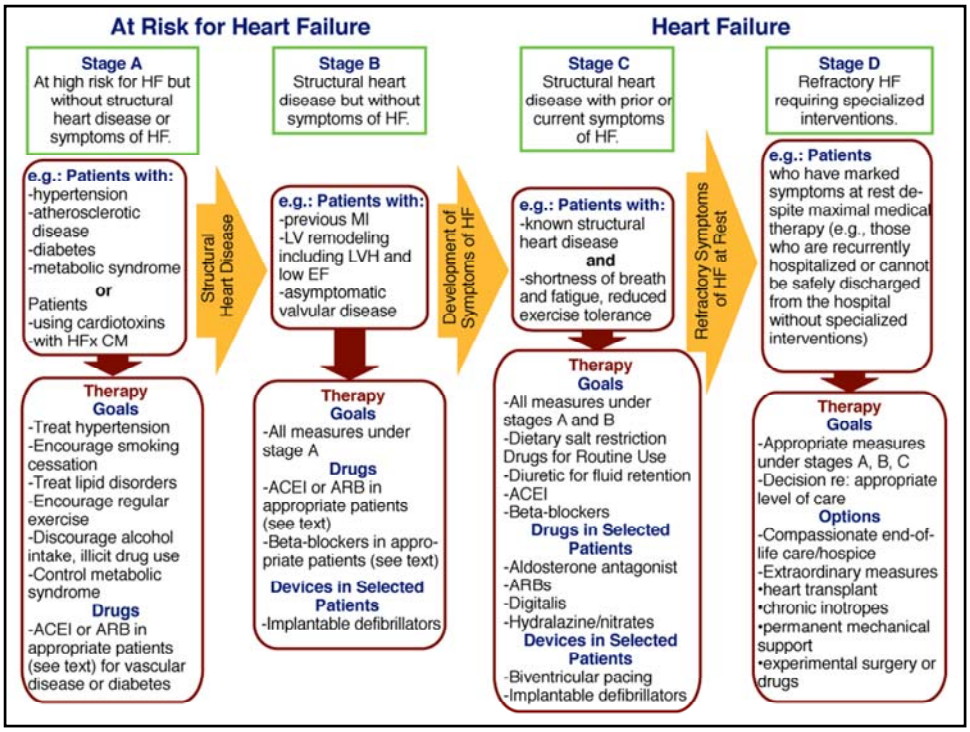
Goals

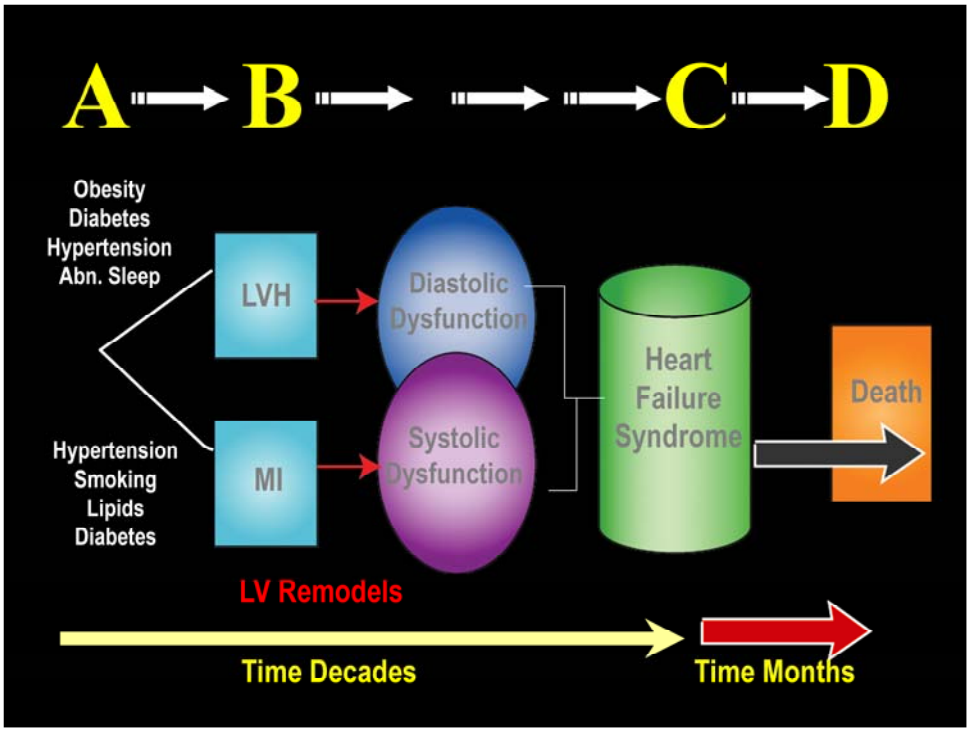
1. ACC/AHA Staging System for Heart Failure (http://www.acc.org/clinical/guidelines/failure/update/index.pdf)
2. Advanced Nature of the Hospitalized Patient with Heart Failure
3. Value of a structured approach to the heart failure patient

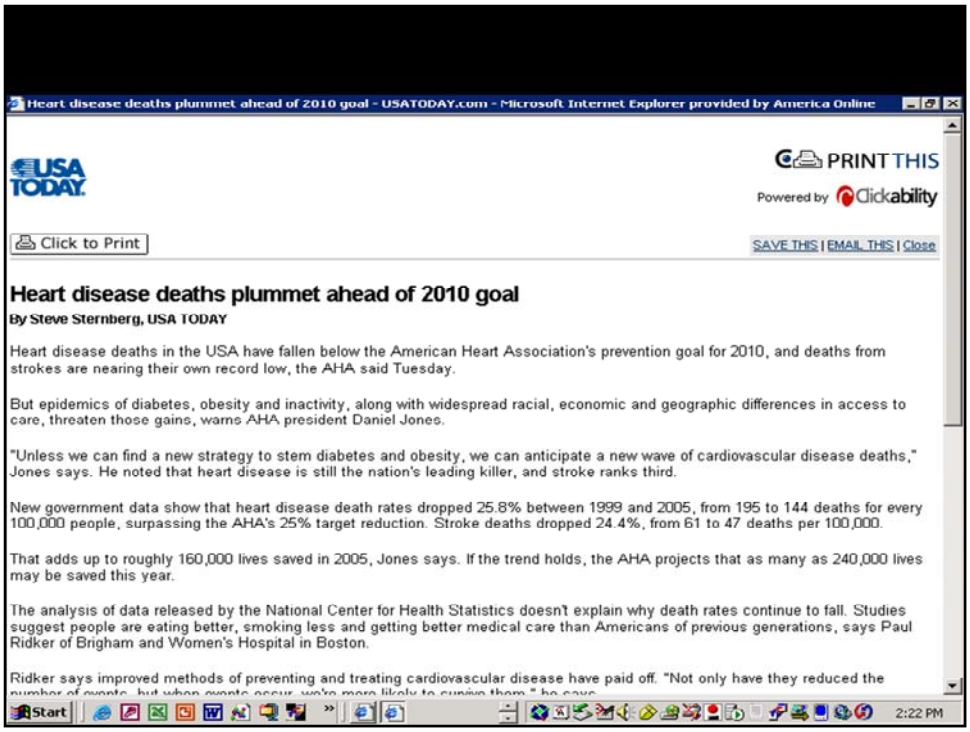
Rationale for a New Way of Classifying Patients With HF in 2001

- HF represents a continuum beginning with risk factors and culminating in end-stage or refractory disease
- There are known risk factors and structural prerequisites leading to the development of LV systolic and/or diastolic dysfunction and the clinical syndrome of HF
- HF is a preventable disorder


A
Ventricular remodeling after acute infarction
Initial infarct
Expansion of infarct
(hours to days)
Global remodeling
(days to months)
B
Ventricular remodeling in diastolic and systolic heart failure
Normal heart
Hypertrophied heart
(diastolic heart failure)
Dilated heart
(systolic heart failure)


At Risk for Heart Failure
Heart Failure
Stage A
At high risk for HF but without structural heart disease or symptoms of HF.
Stage B
Structural heart disease but without symptoms of HF.
Stage C
Structural heart disease with prior or current symptoms of HF.
Stage D
Refractory HF requiring specialized interventions.
e.g.: Patients with:
-hypertension
-atherosclerotic disease
-diabetes
-metabolic syndrome
or
Patients
-using cardiotoxins
-with HFx CM
Structural Heart Disease
e.g.: Patients with:
-previous MI
-LV remodeling including LVH and low EF
-asymptomatic valvular disease
Development of Symptoms of HF
e.g.: Patients with:
-known structural heart disease
and
-shortness of breath and fatigue, reduced exercise tolerance
Refractory Symptoms of HF at Rest
e.g.: Patients
who have marked symptoms at rest despite maximal medical therapy (e.g., those who are recurrently hospitalized or cannot be safely discharged from the hospital without specialized interventions)
Therapy Goals
-Treat hypertension
-Encourage smoking cessation
-Treat lipid disorders
-Encourage regular exercise
-Discourage alcohol intake, illicit drug use
-Control metabolic syndrome
Drugs
-ACEI or ARB in appropriate patients (see text) for vascular disease or diabetes
Therapy Goals
-All measures under stage A
Drugs
-ACEI or ARB in appropriate patients (see text)
-Beta-blockers in appropriate patients (see text)
Devices in Selected Patients
-Implantable defibrillators
Therapy Goals
-All measures under stages A and B
-Dietary salt restriction
Drugs for Routine Use
-Diuretic for fluid retention
-ACEI
-Beta-blockers
Drugs in Selected Patients
-Aldosterone antagonist
-ARBs
-Digitalis
-Hydralazine/nitrates
Devices in Selected Patients
-Biventricular pacing
-Implantable defibrillators
Therapy Goals
-Appropriate measures under stages A, B, C
-Decision re: appropriate level of care
Options
-Compassionate end-of-life care/hospice
-Extraordinary measures
•heart transplant
•chronic inotropes
•permanent mechanical support
•experimental surgery or drugs


A → B → → → C → D
Obesity
Diabetes
Hypertension
Abn. Sleep
LVH
Diastolic Dysfunction
Hypertension
Smoking
Lipids
Diabetes
MI
Systolic Dysfunction
Heart Failure Syndrome
Death
LV Remodels
Time Decades
Time Months


Heart disease deaths plummet ahead of 2010 goal - USATODAY.com - Microsoft Internet Explorer provided by America Online
USA TODAY
PRINTTHIS
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SAVE THIS | EMAIL THIS | Close
Heart disease deaths plummet ahead of 2010 goal
By Steve Sternberg, USA TODAY
Heart disease deaths in the USA have fallen below the American Heart Association's prevention goal for 2010, and deaths from strokes are nearing their own record low, the AHA said Tuesday.
But epidemics of diabetes, obesity and inactivity, along with widespread racial, economic and geographic differences in access to care, threaten those gains, warns AHA president Daniel Jones.
"Unless we can find a new strategy to stem diabetes and obesity, we can anticipate a new wave of cardiovascular disease deaths," Jones says. He noted that heart disease is still the nation's leading killer, and stroke ranks third.
New government data show that heart disease death rates dropped 25.8% between 1999 and 2005, from 195 to 144 deaths for every 100,000 people, surpassing the AHA's 25% target reduction. Stroke deaths dropped 24.4%, from 61 to 47 deaths per 100,000.
That adds up to roughly 160,000 lives saved in 2005, Jones says. If the trend holds, the AHA projects that as many as 240,000 lives may be saved this year.
The analysis of data released by the National Center for Health Statistics doesn't explain why death rates continue to fall. Studies suggest people are eating better, smoking less and getting better medical care than Americans of previous generations, says Paul Ridker of Brigham and Women's Hospital in Boston.
Ridker says improved methods of preventing and treating cardiovascular disease have paid off. "Not only have they reduced the
Start
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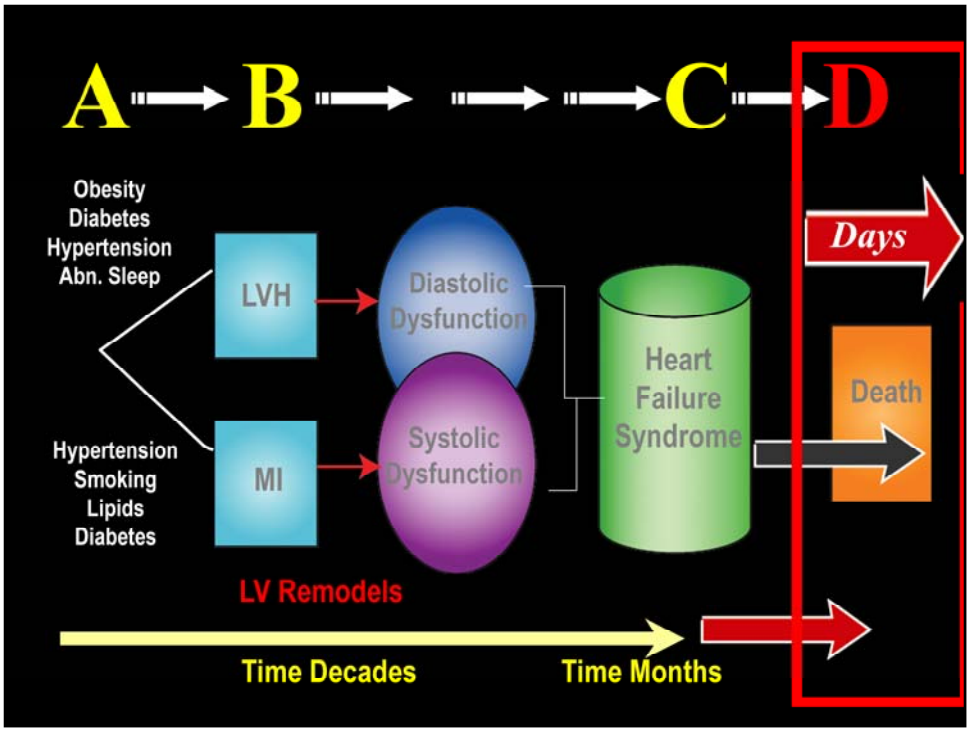
A
B
C
D
Obesity
Diabetes
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LVH
Diastolic Dysfunction
Hypertension
Smoking
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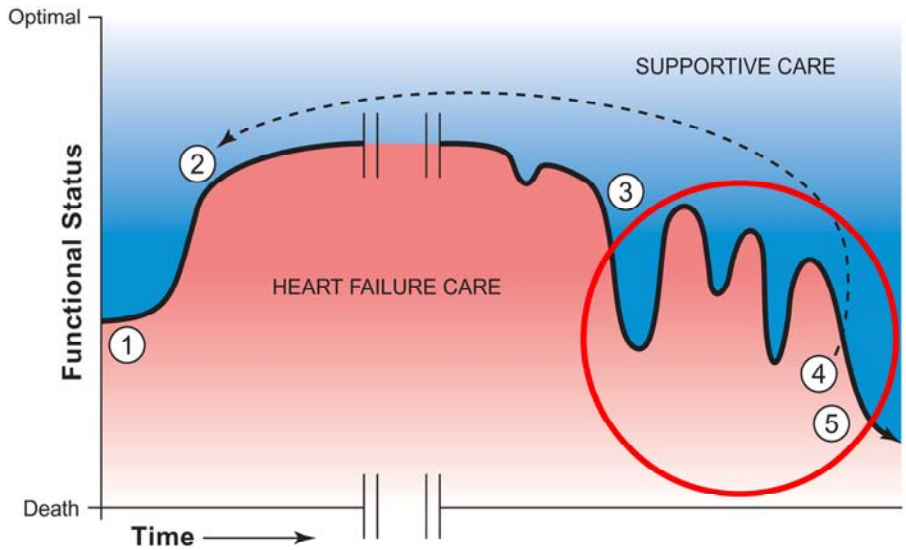
Diabetes
MI
Systolic Dysfunction
Heart Failure Syndrome
Death
Days
LV Remodels
Time Decades
Time Months

Forest for the Trees



How Sick Are They?
Influence of Hospitalization on Mortality

Median Survival (years) After:

Hospitalization	Survival
1	2.4
2	1.4
3	1.0
4	0.6

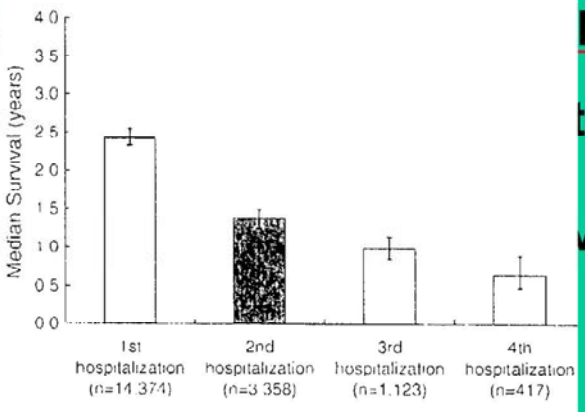
Setoguchi, Stevenson and Schneeweis Am H J 2007;154:260-

Influe **Mortality**

M **ter:**

I **val**

Figure 2



Median survival (50% mortality) and 95% confidence limits in patients with HF after each HF hospitalization.

Setoguchi, Stevenson and Schneeweis Am H J 2007;154:260

How Sick Are They?
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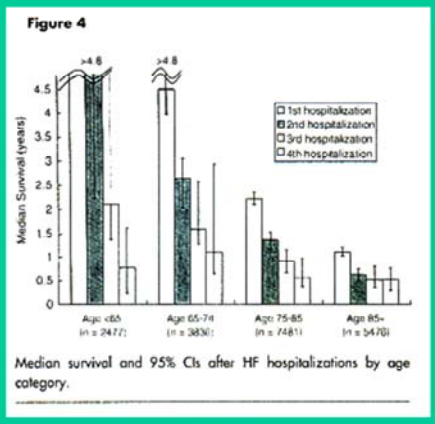

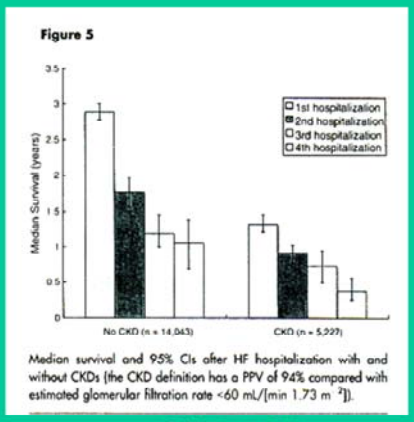

AGE **eGFR < 60**

Setoguchi, Stevenson and Schneeweis Am H J 2007;154:260

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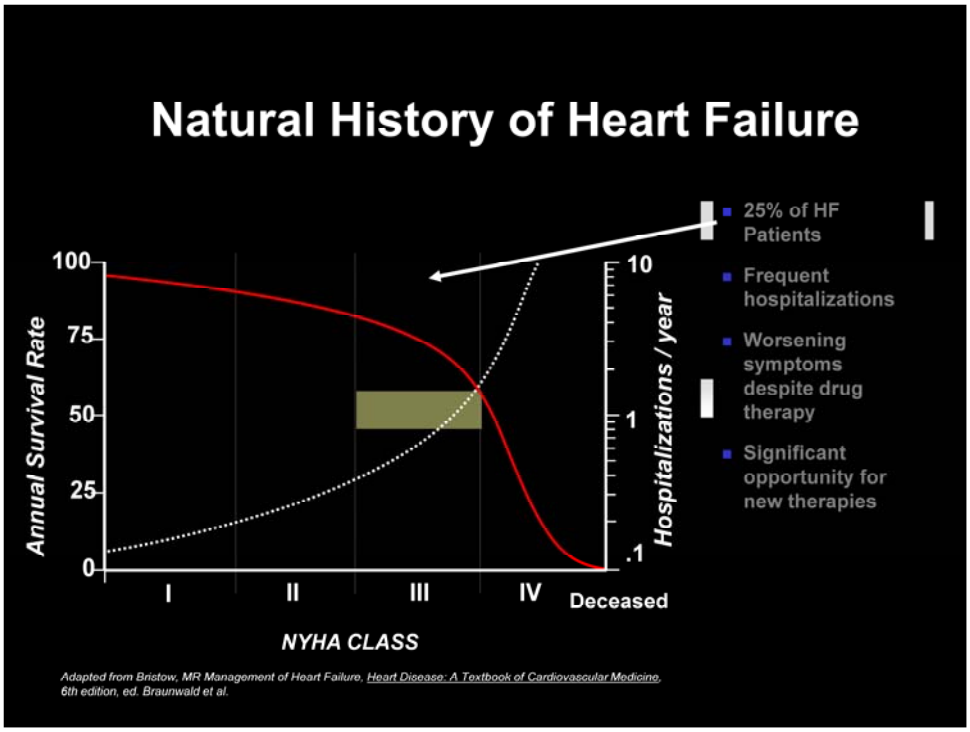
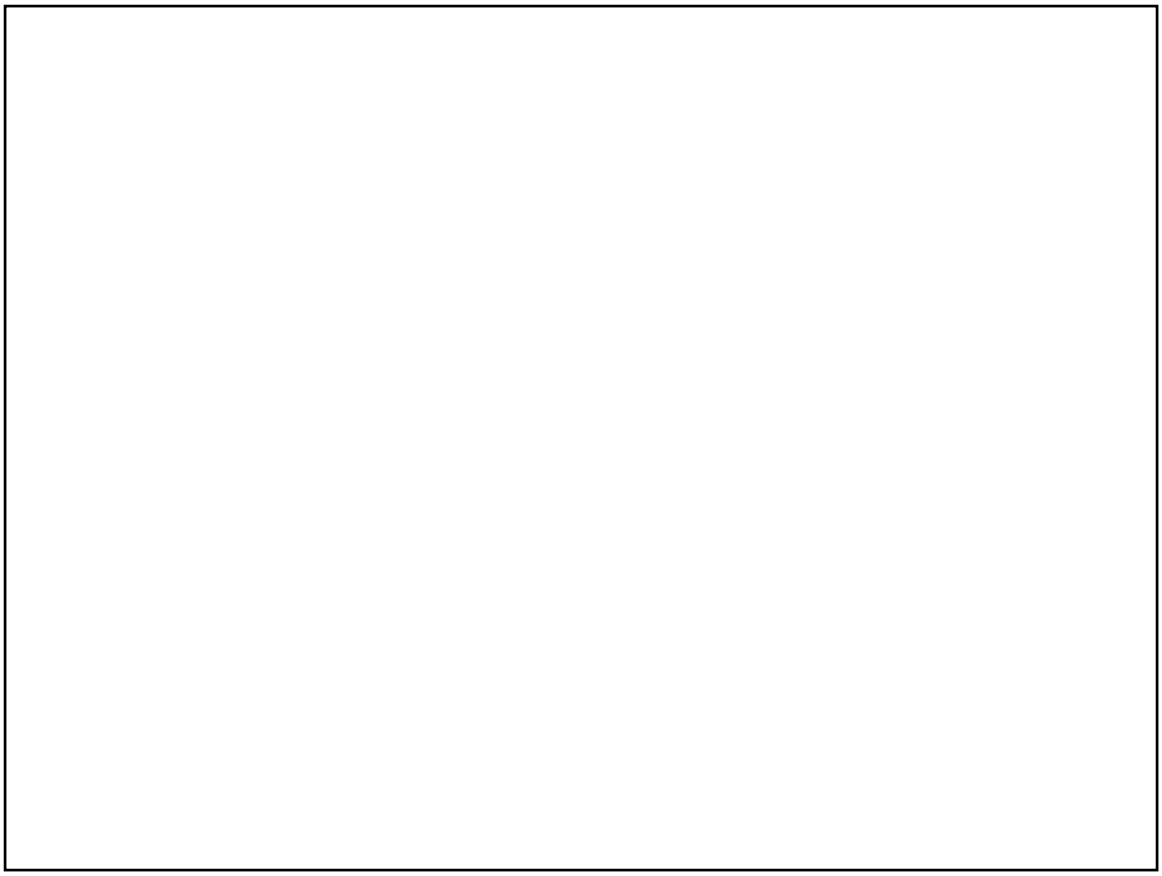


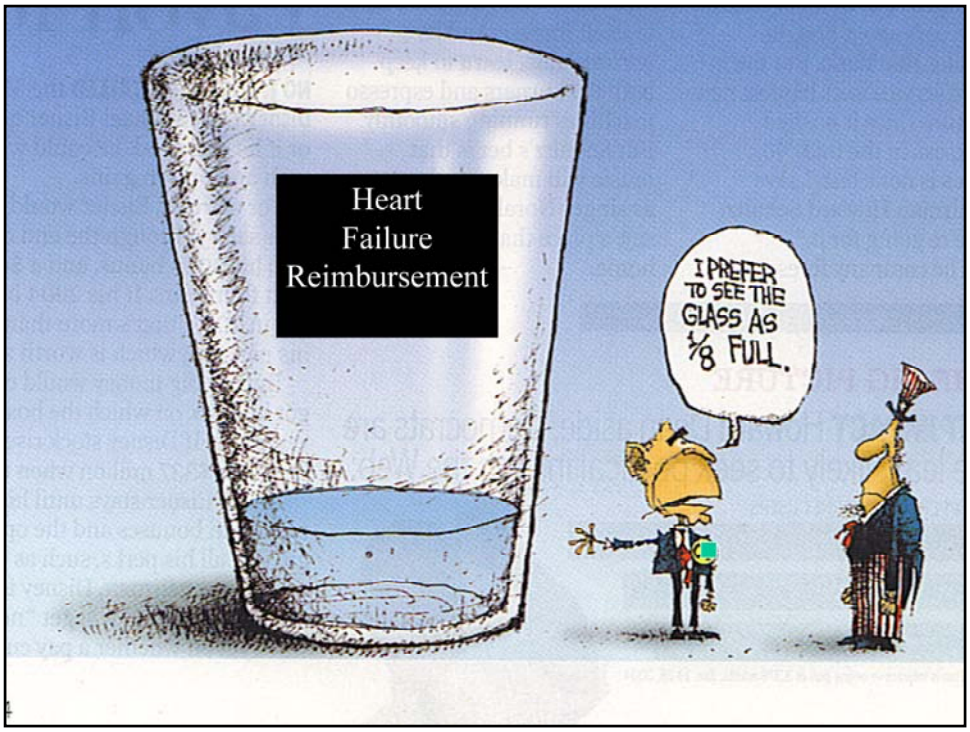
What are we looking at in terms of our initial target population for therapies such as Acorn CorCap? To look at that I placed them in the context of the spectrum of patients from NYH class I II III,IV. In the early stages the survival rate is pretty good not unlike what you would see in an ?age-match control population? number of hospitalizations are very low. On the other extreme in the NYH class IV patients, where the mortality rate is very high and very low survival rate, hospitalizations are also high. These are the patients that need things like ”rescue therapies” Lvads, and transplants. In between is a very sizable group in the NYH class III. These are patients that are on the same drug therapies they were on in class II but are failing that therapy. They are having continued symptoms or progressive symptoms despite this medicated therapy. They are having frequent hospitalization causing great morbidity as well as a slippery-slope of increased mortality. Where they go from a state of being stable in class II and transition from that stable class to a class where the mortality rate is very high. So all the action is happening right here in class III. This is where the big gap is and where the focus of the attention is in a lot of centers such as your own. We feel this is the most appropriate and perfect spot for a device such as ours. It is not a rescue therapy and may not be something you want to go through surgery for someone who is stable. But the patient who is at risk for that slippery-slope, repeated hospitalizations high morbidity high potential for mortality is where this opportunity for new therapies are best.. We feel we bridge that gap from the medical therapy to the rescue therapy.

Pay-for-Performance

"It is time that we pay for the quality of the health care provided to our beneficiaries, not simply the amount. We are working to apply this in every setting in which Medicare and Medicaid pays for care."

- Former CMS Administrator Mark B. McClellan, M.D., Ph.D.




Heart
Failure
Reimbursement
I PREFER TO SEE THE GLASS AS 1/8 FULL.

The Premier Hospital Quality Incentive Demonstration

Heart Failure Measures

- Left ventricular function (LVF) assessment
- Detailed discharge instructions
- ACEI for Left Ventricular Systolic Dysfunction
- Smoking cessation advice/counseling

The Proctor Harvey Five Finger Approach to Cardiovascular Disease

- History/Physical
- Auscultation
- Chest X Ray
- ECG
- Specialized Lab Tests

"Make sure all five fingers fit together like a fist… If not, reconsider your diagnosis."

Office, Evidence and Guideline-Based 5 Finger Approach to Heart Failure

1. Assess Current Functional Status
   (From this come NYHA Class and ACC/AHA Stage)
2. Exam—Evidence for Volume and Perfusion
3. Review Medications/Testing/Prognosticators
4. Critical Thinking—Next (Evidenced Based) Steps
5. Review General Measures

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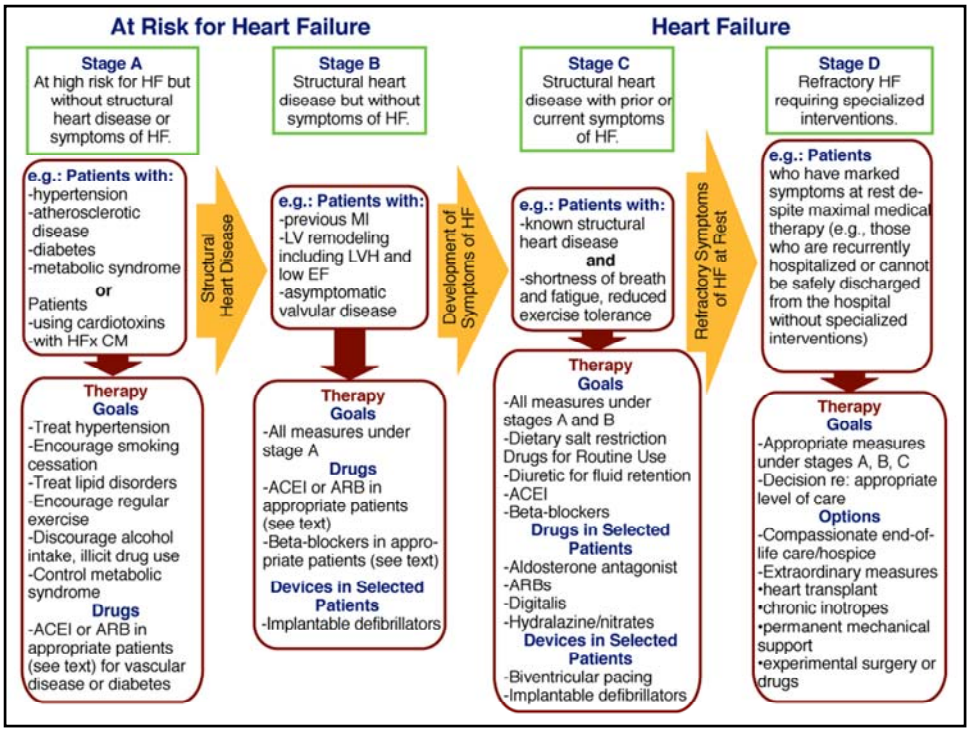
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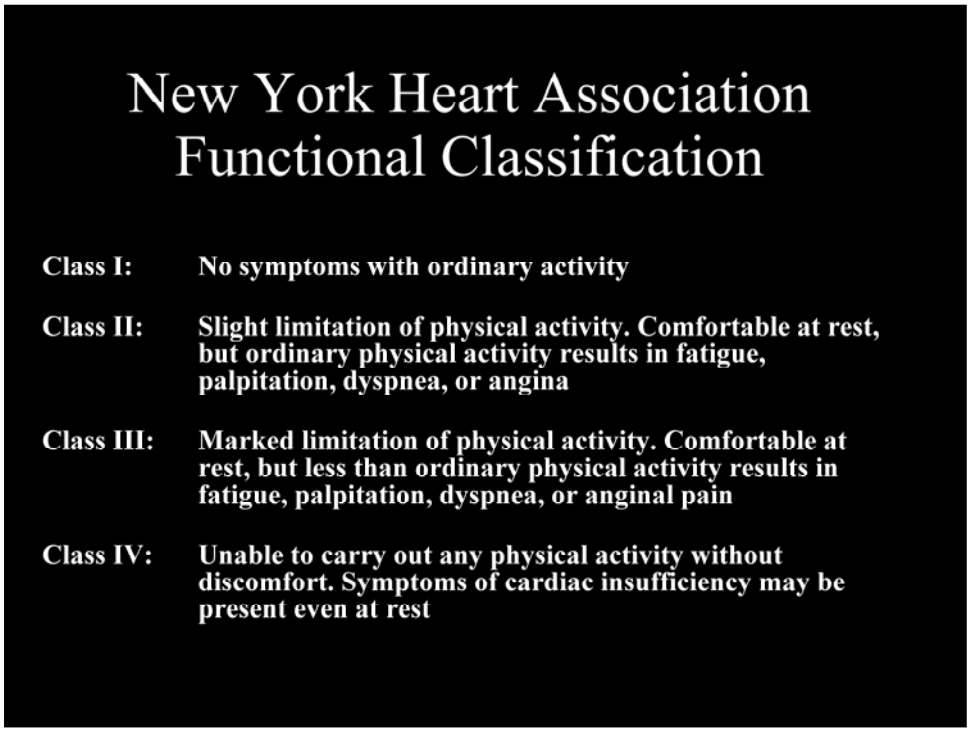


After completing a thorough history and physical exam, physicians will commonly use the New York Heart Association (NYHA) functional classification to help describe the degree of physical disability a patient has. The NYHA class is also commonly used to determine entry criteria for patients participating in clinical research trials.

5 Finger Approach to Heart Failure

Assess Current Functional Status

Easy to Do….Begins the Conversation

"How are you doing"

"What was your summer like?"

"Are you still walking/biking, etc"

↓

Easily compared to last visit

↓

Write Down Their NYHA Functional Class

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."

→ ***Functional Status***

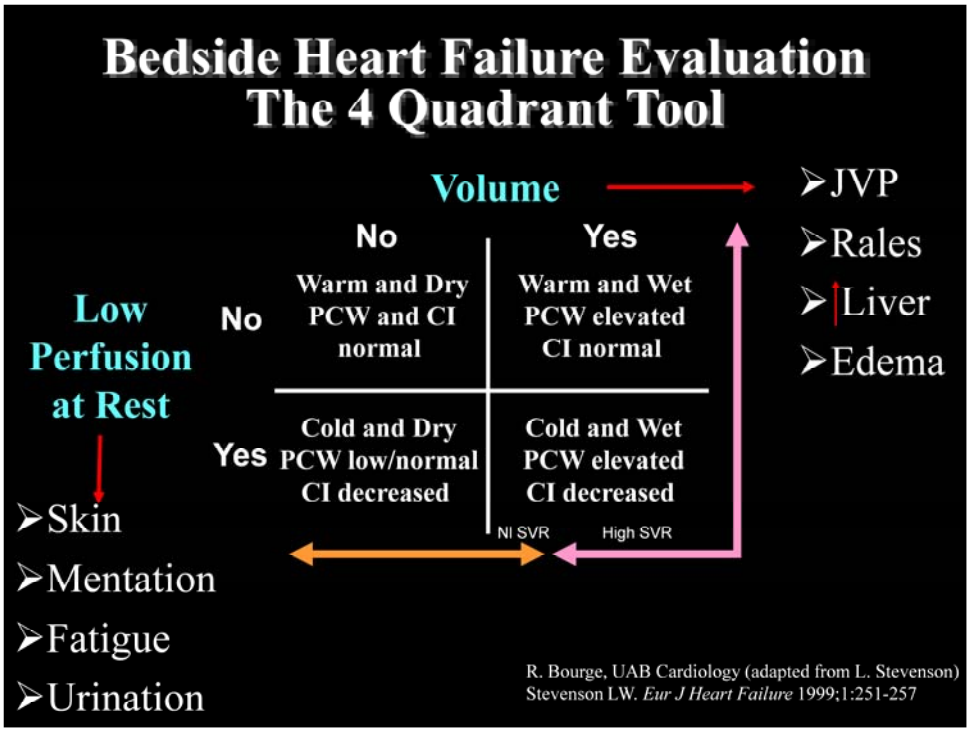
5 Finger Approach to Heart Failure

Exam—Assess Volume and Perfusion

Easy to Do…Touch Their Hand (Ears/Nose) Exam

Fit into 4 Quadrant Model

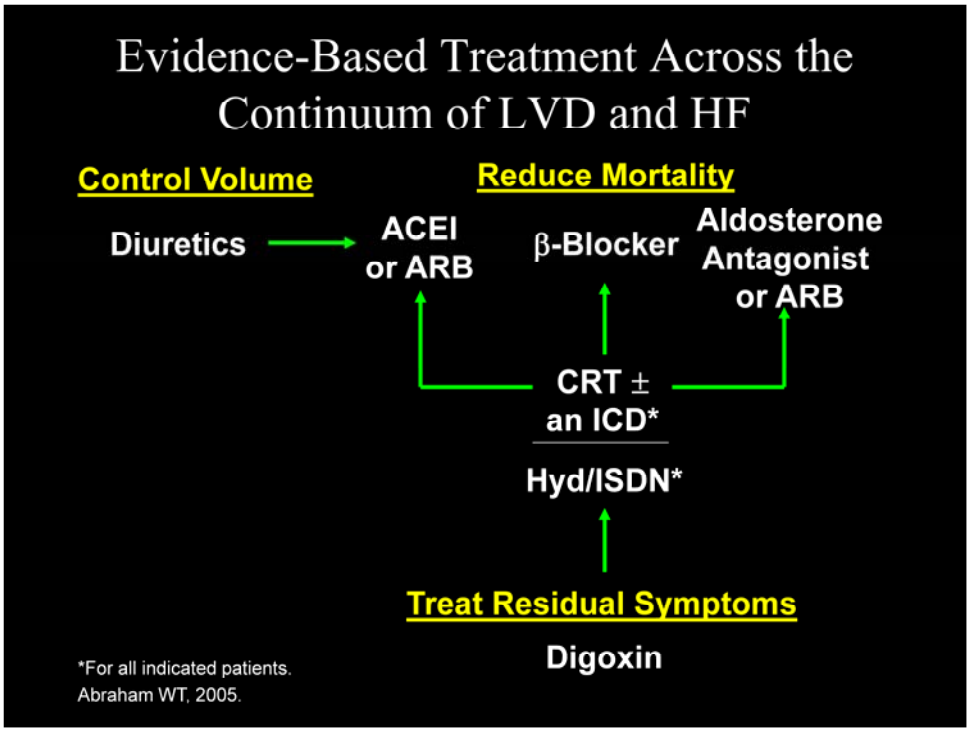
"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."



The hemodynamic profiles of patients with advanced HF. The majority of patients with heart failure are volume overloaded ("wet"). These patients may have cardiac index that is unchanged or decreased. Most patients with decreased cardiac index have elevated systemic vascular resistance, though a minority will have unchanged or low SVR.

Vasodilators would be expected to have therapeutic benefits in the "wet and warm" and the majority of "wet and cold patients." While intravenous intropic therapy is often employed to reduce filling pressures and improve cardiac output, intravenous vasodilator therapy in the setting of vasoconstriction can often achieve similar results without the risks of aggravating ischemia and arrhythmias, and with easier transition to oral vasodilator regimens.

Patients with signs of systemic hypoperfusion that are "dry" would be expected to have therapeutic benefits with volume loading and/or inotropic agents.


Evidence-Based Treatment Across the Continuum of LVD and HF
Control Volume
Diuretics
Reduce Mortality
ACEI or ARB
β-Blocker
Aldosterone Antagonist or ARB
CRT ± an ICD*
Hyd/ISDN*
Treat Residual Symptoms
Digoxin
*For all indicated patients.
Abraham WT, 2005.

Performance Measures…Things TO DO….

Table 7. ACC/AHA/Physician Consortium for Performance Improvement Heart Failure Performance Measurement Set: Outpatient Measure Descriptions

Performance Measure Name	Measure Description
1. Initial laboratory tests	Initial laboratory evaluation of patients with newly diagnosed HF.
2. Left ventricular systolic (LVS) function assessment	Heart failure patients with documentation that LVS has been assessed.
3. Weight measurement	Measurement of patient's weight at each outpatient visit to assess change in volume status.
4. Blood pressure measurement	Measurement of patient's blood pressure at each outpatient visit.
5. Assessment of clinical symptoms of volume overload (excess)	Assessment of clinical *symptoms* of volume overload at each outpatient visit.
6. Assessment of clinical signs of volume overload (excess)	Completion of a physical examination pertaining to volume status assessment in patients diagnosed with HF at each outpatient visit.
7. Assessment of activity level	Evaluation of the impact of HF on activity level at each outpatient visit.
8. Patient education	Percentage of patients who were provided with patient education on disease management and health behavior changes during one or more visits within the period of assessment.
9. Beta-blocker therapy	Prescription of beta-blockers in patients with HF and left ventricular systolic dysfunction (LVSD).
10. ACE inhibitor or angiotensin receptor blocker (ARB) therapy for patients with heart failure who have left ventricular systolic dysfunction (LVSD)	Prescription of ACE inhibitor or ARB for management of outpatient HF patients with LVSD.
11. Warfarin therapy for patients with atrial fibrillation (AF)	Use of warfarin in patients with both HF and AF.

5 Finger Approach to Heart Failure

Exam—Assess Volume and Perfusion

Easy to Do…Touch Their Hand (Ears/Nose)

4 Quadrant Model

↓

Easily compared to last visit

↓

Write Down Their Volume/Perfusion Status

Functional Status,
Bedside Hemodynamics

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."

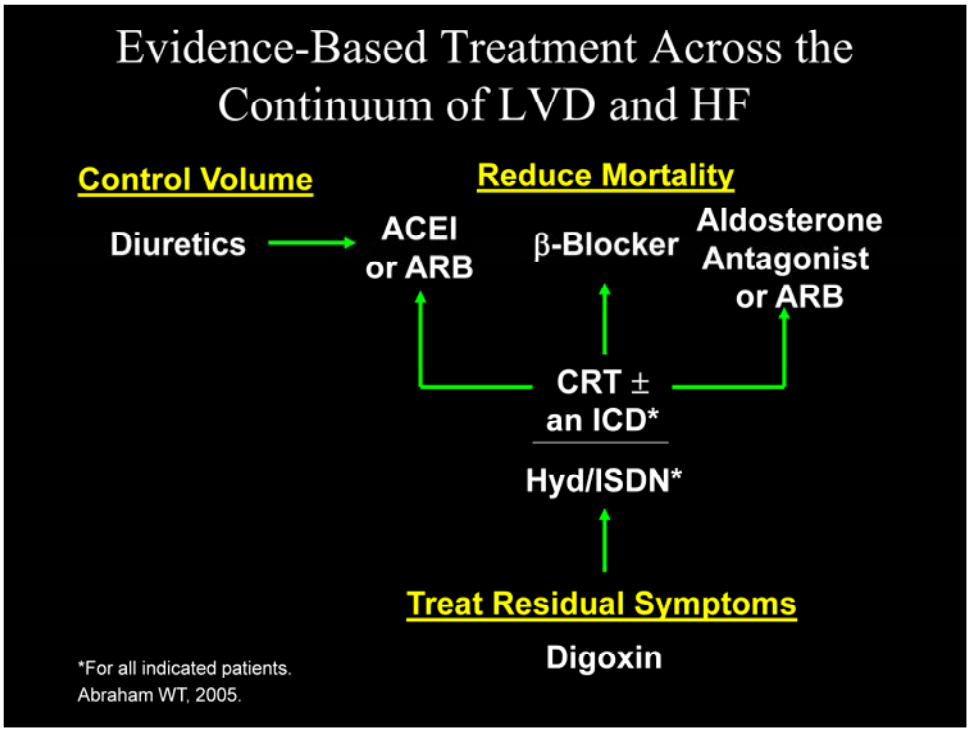
5 Finger Approach to Heart Failure

Medication / Testing / Prognostic Review

Easy to Do….

Are they on the evidenced based meds?

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."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Treat Residual Symptoms
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Abraham WT, 2005.

HFSA 2006 Practice Guideline

ACE Inhibitors

- are recommended
- may be considered
- should be considered

5 Finger Approach to Heart Failure

Medication / Testing / Prognostic Review

Easy to Do….

Are they on the evidenced based meds?

↓

Are they on target doses?

↓

If not, why not? (Write it down)

Repeat Step for Testing (echo) or

Non-Pharmacologic Therapy (ICD/CRT)

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."

→

Functional Status

Bedside Hemodynamics

Meds/Devices

5 Finger Approach to Heart Failure

Medication / Testing / Prognostic Review

Easy to Do….

Are they on the evidenced based meds?

How Sick Are They….Do I Need Help?

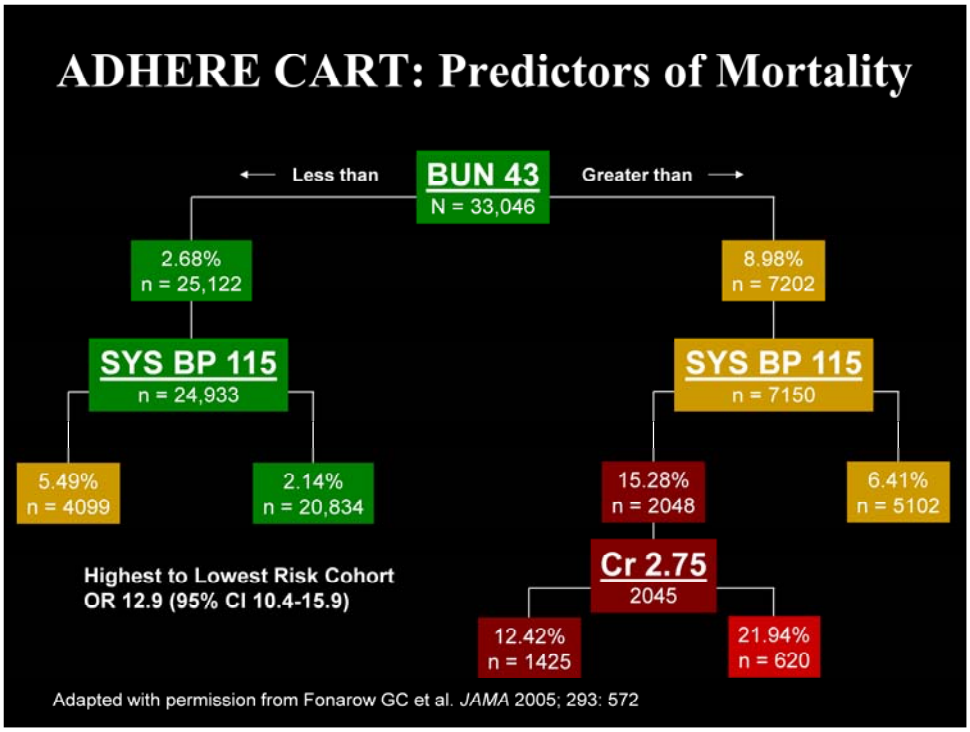
"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."

Predictors of Mortality Based on Analysis of ADHERE Database

BUN > 43 mg/dL

Systolic blood pressure < 115 mmHg

Serum creatinine > 2.75 mg/dL



ADHERE® CART: Predictors of Mortality

- CART analysis from ADHERE® shows that the 3 greatest predictors of mortality are BUN >43, SBP <115, and SCr >2.75. The subgroup patients with all 3 predictors have a mortality rate of 21.94%. Patients with none of these risk factors have a mortality rate of 2.14%.
- Patients with high, intermediate, or low risk for mortality can be identified by vital sign and laboratory data collected at admission for HF.

1. Fonarow GC et al. *JAMA.* 2005. 293:572

Current Devices – HeartMate VE

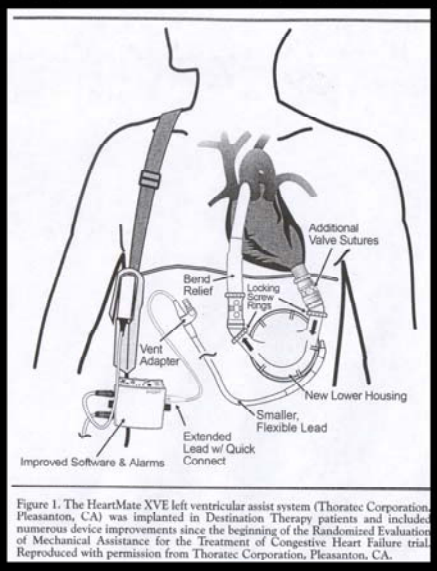
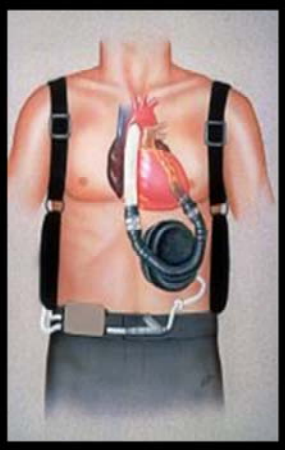


Figure 1. The HeartMate XVE left ventricular assist system (Thoratec Corporation, Pleasanton, CA) was implanted in Destination Therapy patients and included numerous device improvements since the beginning of the Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure trial. Reproduced with permission from Thoratec Corporation, Pleasanton, CA.



5 Finger Approach to Heart Failure

Critical Thinking /Medical Decision Making

Next Steps ("Shhh, I'm thinking")

Easy to Do….

Take this…..

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."

Functional Status

Bedside Hemodynamics

Meds/Devices

5 Finger Approach to Heart Failure

Critical Thinking /Medical Decision Making

Next Steps ("Shhh, I'm thinking")

Easy to Do….

Take this…..

Functional Status

Bedside Hemodynamics

Meds/Devices

→

Are there gaps?

Can They be Better?

Meds to add?

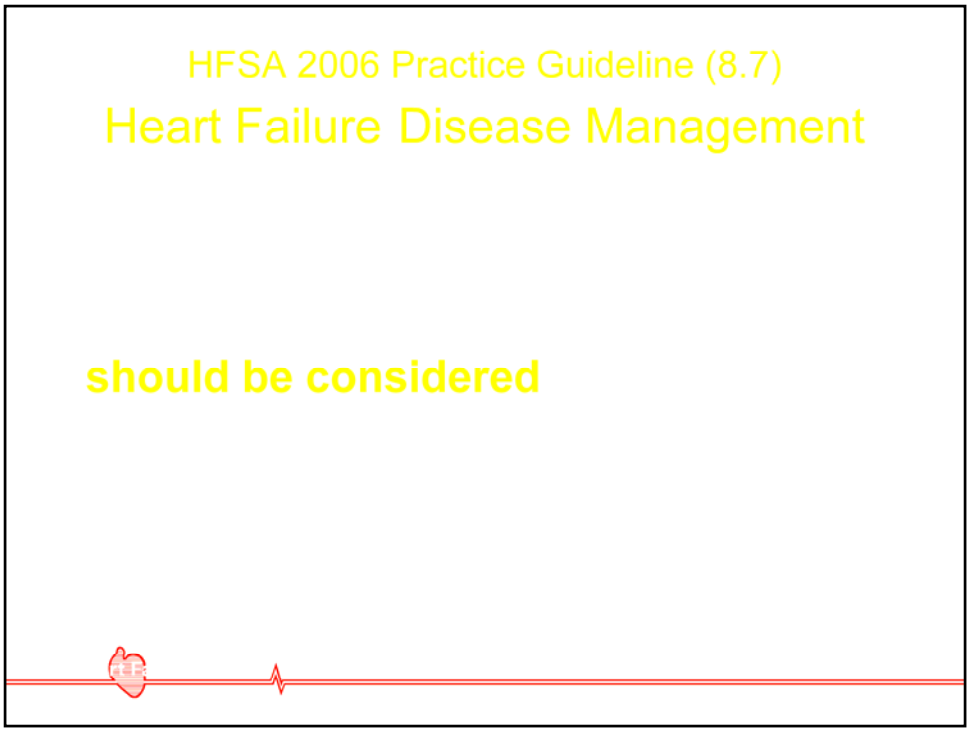
Things to Do?

Refer? Other Med Problems?

Advanced Therapies?

Palliation?

"Make sure all five fingers fit together like a fist… If not, reconsider your diagnosis."



High risk patients include those with renal insufficiency, low output state, diabetes, COPD, persistent NYHA class III or IV symptoms, frequent hospitalization for any cause, multiple active co-morbidities, or a history of depression, cognitive impairment, or persistent non-adherence to therapeutic regimens.

The evidence that led to the A rating was a collection of single-center randomized controlled trials. Examples include the following:

1. Stewart S, MarleyJE, Horowitz JD. Effects of a multidisciplinary, home-based intervention on unplanned readmissions and survival among patients with congestive heart failure: a randomised controlled study. Lancet 1999;354:1077-83.

   Intervention: Home visit be a nurse 7-14 days after discharge

   Results: During 6 month follow up there were 129 primary endpoint events (unplanned readmission for HF) in usual-care group, 77 in the treatment group ($p = .02$). More intervention group that usual-care patients remained event-free (38 vs. 51, $p = .04$).

2. Rich MW, Beckham V, Wittenberg C, Leven CL, Freedland KE, Carney RM. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. N Engl J Med 1995;333:1190-5.

   Intervention: Nurse-directed multidisciplinary intervention on high risk hospitalized patients 70 or older.

   Results: Risk ratio for readmission at 90 days .56 ($p = .02$). Quality of life improved at 90 days ($p = .0001$)

3. Cline CM, Israelsson BY, Willenheimer RB, Broms K, Erhardt LR. Cost effective management programme for heart failure reduces hospitalisation. Heart 1998;80:442-6.

   Intervention: Education on HF and self-management with follow-up at nurse-directed HF clinic for 1 year after discharge.

   Results: No difference in survival rate at 1 year. Mean time to readmission 141 days in treatment vs. 106 in control ($p < .05$). Days in hospital fewer for treatment, but at $p = .07$ level.

4. Doughty RN, Wright SP, Pearl A, Walsh HJ, Muncaster S, Whalley GA, et al. Randomized, controlled trial of integrated heart failure management: The Auckland Heart Failure Management Study. Eur Heart J 2002;23:139-46.

   Intervention: Clinical review at hospital-based HF clinic early after discharge, education sessions, personal diary, information booklets, and regular follow up at HF clinic and PC practitioner.

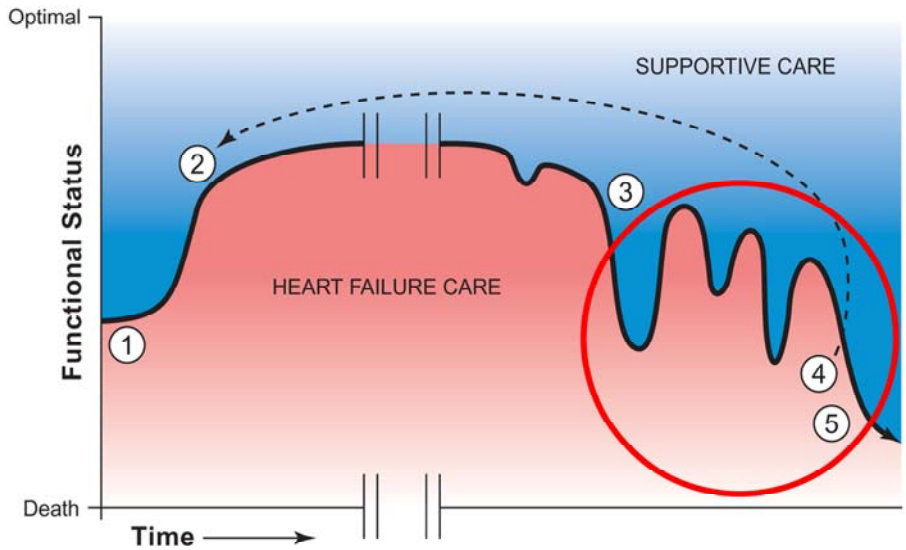
   Results: No significant difference in groups for combined endpoint of death or readmission. Quality of life improved in treatment group at 12 months ($p = .015$). Readmissions were 56 in the treatment group vs 95 in the control group ($p = .015$).

5. Stromberg A, Martennson J, Fridlund B, Leven LA, Karlsson JE, Dahlstrom U. Nurse-led heart failure clinics improve survival and self-care behaviour in patients with heart failure: results from a prospective, randomized trial.

   Intervention: Follow-up at a nurse-led HF clinic.

   Results: Fewer patients with events (death or admission) in treatment group at 12 months (29 vs 40, p =

Forest for the Trees



HFSA 2006 Practice Guideline (8.13)

End-of-Life Care in Heart Failure

should be considered

5 Finger Approach to Heart Failure

Critical Thinking /Medical Decision Making

Next Steps ("Shhh, I'm thinking")

Are there gaps?

Can They be Better?

Meds to add?

Things to Do?

Refer? Other Med Problems?

Advanced Therapies?

Palliation?

→

Functional Status

Bedside Hemodynamics

Meds/Devices

A PLAN

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."

5 Finger Approach to Heart Failure

Review General Measures (EDUCATION)

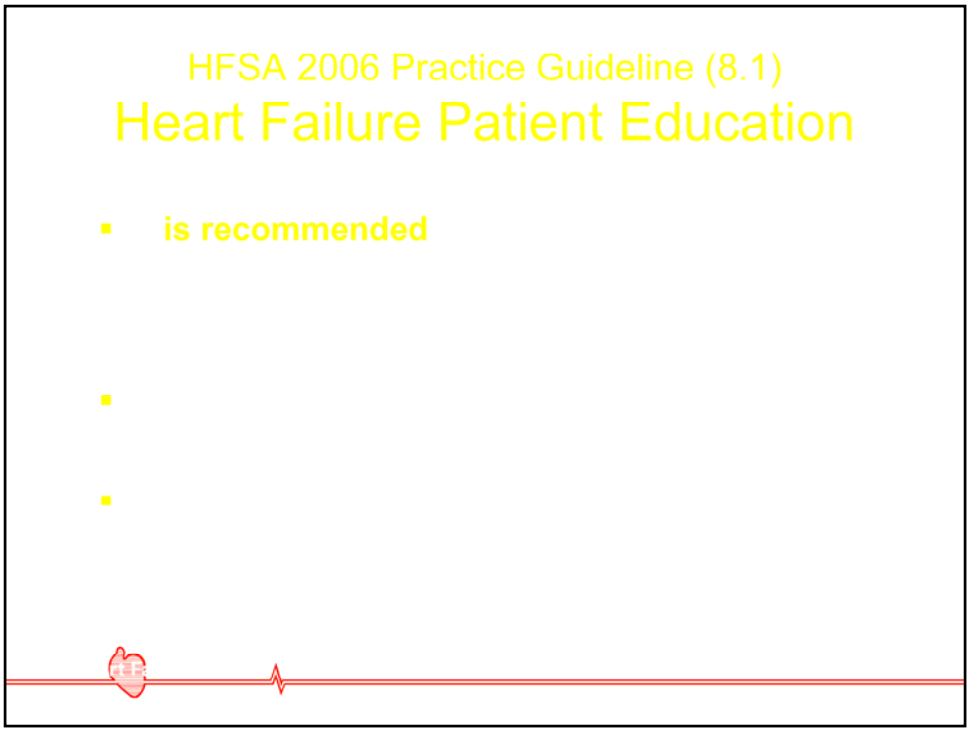
Easy to Do….(Rely on Nurses to Help)

Review Salt and Fluids

Ask About Influenza and Pneumococcal Vaccines

ALWAYS Talk About Exercise Activity

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."



The most intensive education is needed for patients in NYHA class III-IV.

Examples of skills and target behaviors:

Perform daily weights

Develop action plan for notifying provider if symptoms change

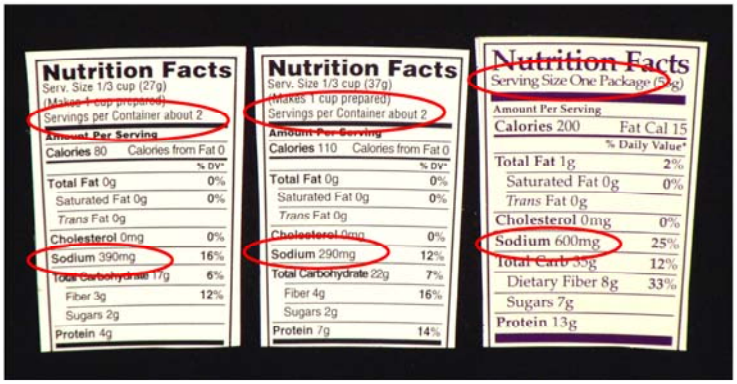
State reasons for taking medications

Describe a plan for a missed dose

State blood pressure goal and current blood pressure

Demonstrate ability to read food label for sodium per serving

Sample Target Behavior: Be Able to Read and Understand Food Labels



Labels from cups of soup

These are all labels from cups of dried soup. The two labels on the left are from the same brand and show the variability that can occur from one soup to another. The label on the right is from another brand and appears to show a much higher sodium content. But when you look at the servings per container (upper ovals), you see that the soups on the left have 2 per container, meaning you must double sodium content. As a result, the container on the left has the greatest amount of sodium—nearly 800 mg.

5 Finger Approach to Heart Failure

5 Fingers Simplified

Functional Status

(Stage and Class)

Bedside Hemodynamics

Meds/Devices

A PLAN

Education

"Make sure all five fingers fit together like a fist…
If not, reconsider your diagnosis."


New Edition
Third Edition
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Failure
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with Congestive Heart Failure
Marc Silver, M.D.
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and doctors dealing with heart failure."
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Marc Silver, M.D.