Optimal Heart Failure Management using the Chronic Disease Model

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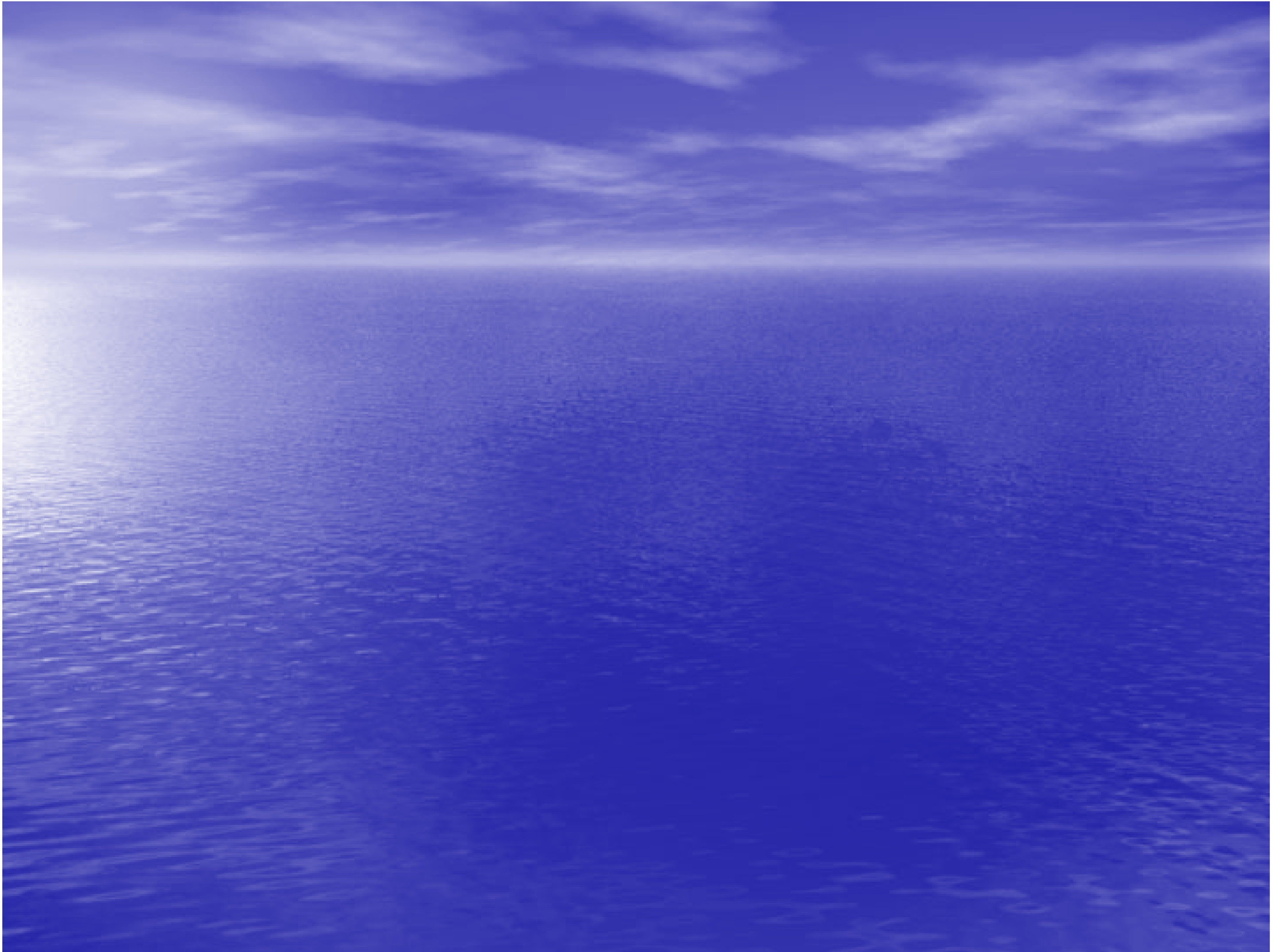


Motivations for addressing heart failure

- Increased incidence
- High mortality
- Frequent hospitalizations/re-admissions
- Loss of money per hospitalization due to reimbursement that is less than the cost of caring for the patient

Overview of the Incidence

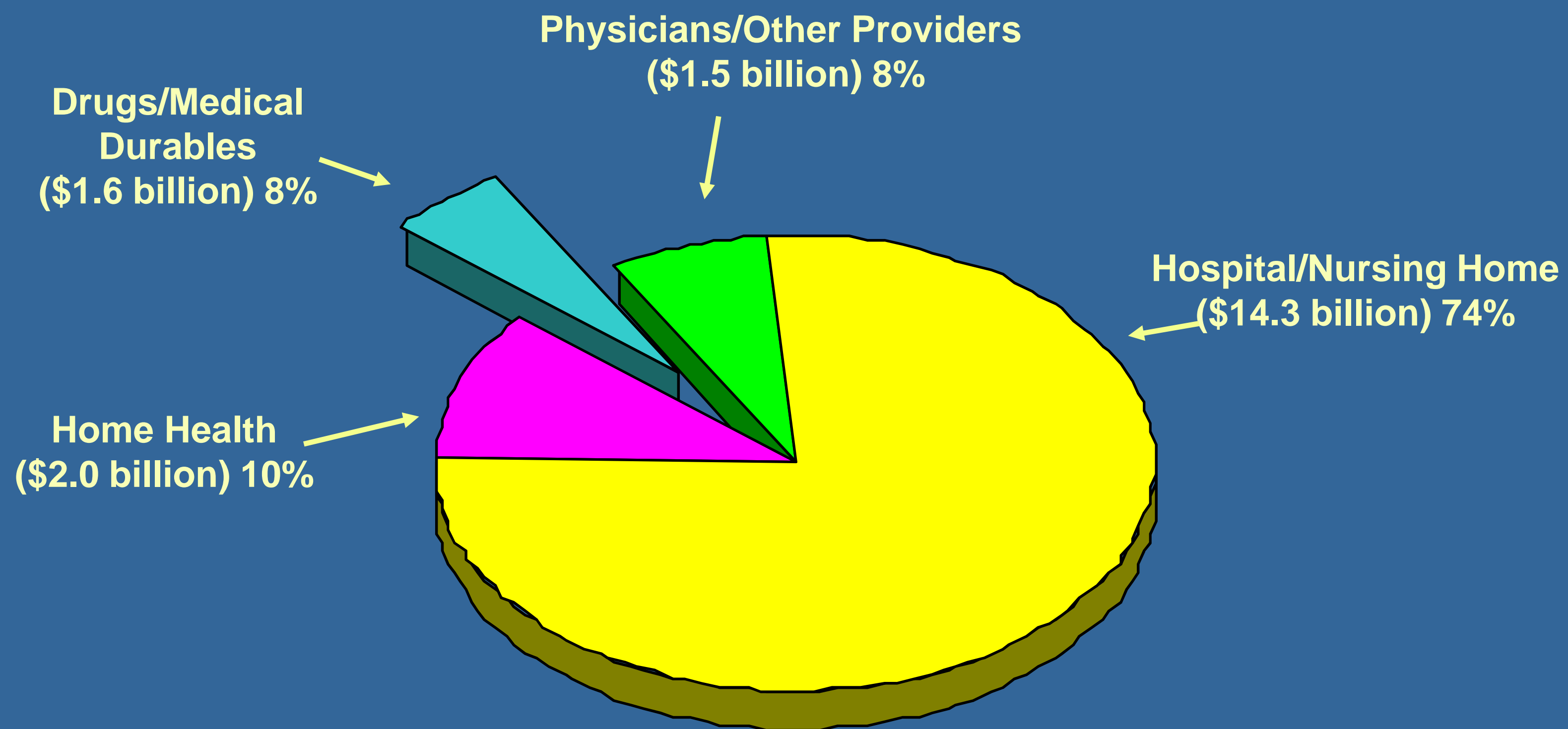
- Affects nearly 5 million people in the US
- Affects 6 to 10% of the elderly
- Leading cause of hospitalization for those over age 65
- DRG 127
  - 1,000,000 admissions as primary diagnosis
  - 2,000,000 admissions as secondary
  - 6.5 million hospital days per year

- High readmission rate of 40 to 60% within 6 months of previous hospitalization
- 12 to 15 million clinic visits a year

Chronic Heart Failure A Major Cause of Death and Disability

- Average survival after a diagnosis of Stage C CHF is ~ 5 years
- 300,000 deaths per year related to CHF
- Premature disability due to CHF may cost the economy as much as $30-50 billion per year

Economic Burden of HF in US

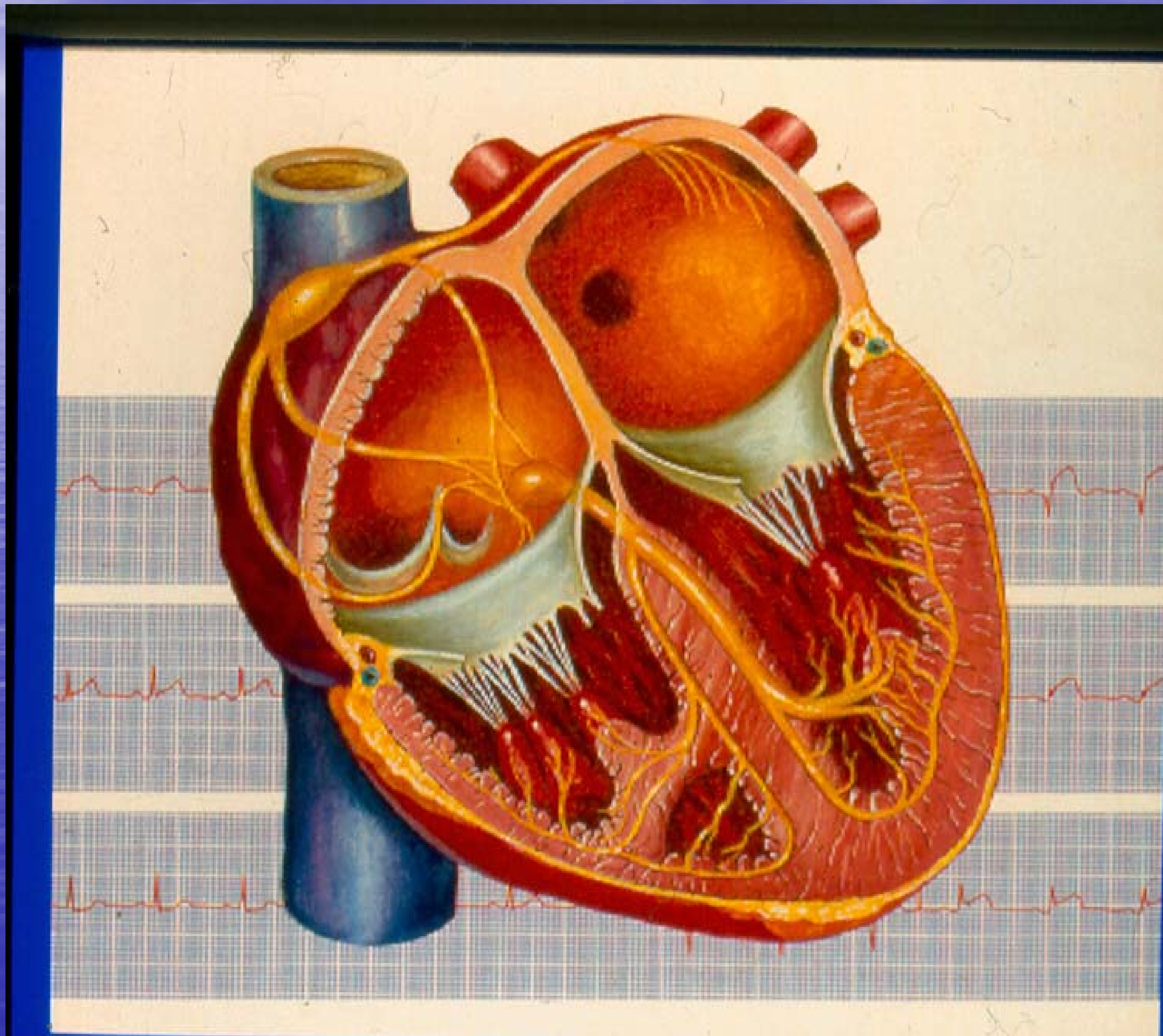


Adapted from American Heart Association. *2001 Heart and Stroke Statistical Update.* 2000.

Definition of Heart Failure

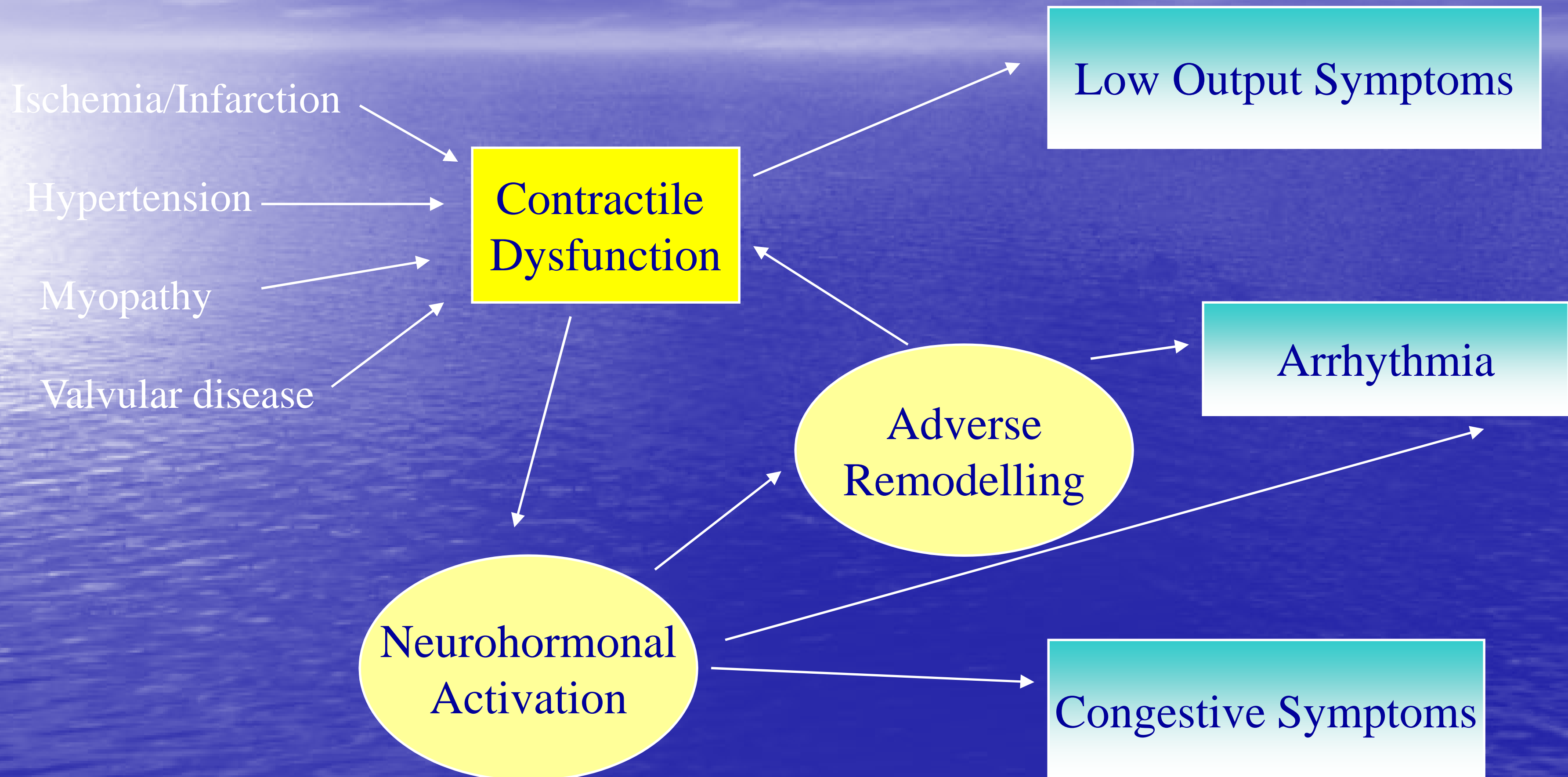
- Inadequate blood supply to maintain normal function. Symptoms may be present at rest and/or only during exercise.

Normal EF >50%
Decreased EF < 40%



Overview of Heart Failure

Disease Progression in CHF



Management of Heart Failure

- Progressive Chronic Disease
  - Hemodynamic and Neurohormonal abnormalities often precede symptoms
- Heart failure can be prevented in high risk patients.
- Survival can be improved by blocking neurohormonal pathways in patients with all stages of heart failure.

ACC/AHA Guidelines

- Class I: Evidence for benefit and general agreement that the treatment is useful and effective
- Class II: Conflicting evidence and/or divergence of expert opinion on utility and efficacy of a treatment
  - IIa: weight of evidence and opinion is in favor of treatment
  - IIb: weight of evidence and opinion is less established
- Class III: Evidence and general opinion is that treatment is ineffective and in some cases harmful

Recommendations for Evaluation of Patients with CHF

- Assess functional status
- Assess Volume status
- Serial Assessment of renal function and electrolytes
- Initial Echo to evaluate systolic function
- Cardiac Cath in patients with CHF and angina

Stages of Heart Failure

- Stage A: Patients at high risk of developing HF but without structural heart disease
  - Hypertension
  - Coronary Disease
  - Diabetes
  - Family History of Cardiomyopathy
  - Cardiotoxin exposure

Recommendations for Treatment

- Stage A
  - Control Hypertension
  - Control Lipids
  - Lifestyle changes
  - ACE inhibitors in CAD and Diabetes
  - Control of ventricular rate in SVTs
  - Treat Thyroid disorders
  - Non-invasive evaluation of LV function

Stages of Heart Failure

- Stage B: Patients with structural heart disease but no signs or symptoms of HF
  - LVH
  - LV dilatation and contractile dysfunction
  - Valvular stenosis or regurgitation
  - Myocardial Infarction

Recommendations for Treatment

- Stage B
  - ACE inhibitors post-MI (recent or remote)
  - ACE inhibitors in reduced EF
  - Beta-Blockade in recent MI
  - Valve surgery for hemodynamically significant lesions
  - (all Stage A recommendations apply)

Stages of Heart Failure

- Stage C: Patients with structural heart disease and signs and symptoms of HF

Recommendations for Treatment

- Stage C (class I recommendations)
  - Diuretics in patients with evidence of fluid retention
  - ACE inhibitors in all patients unless contraindicated
  - Beta-blockade in all patients once stabilized unless contraindicated
  - Digitalis unless contraindicated
  - Withdrawl of NSAIDs, most anti-arrhythmic drugs, and most calcium channel blocking drugs

Recommendations for Treatment

- Stage C (class III recommendations)
  - Long term intermittent inotrope infusions
  - Use of AII blocker instead of an ACE inhibitor in patients who can tolerate ACE inhibitors
  - Use of a Calcium channel blocker to treat CHF
  - Routine use of nutritional supplements or hormonal therapies (CoQ10, growth hormone, thyroid hormone)

Stages of Heart Failure

- Stage D: Patients with structural heart disease and signs and symptoms of HF that are refractory to standard oral therapy
  - Continued or recurrent functional class IV symptoms

Recommendations for Treatment

- Stage D (Class I)
  - Meticulous control of fluid retention
  - Referral for transplantation in eligible patients
  - Referral to a program with expertise in treatment of refractory HF
  - Hospice referral for end of life care
  - All measures listed in Stage A,B, and C unless contraindicated

Recommendations for Treatment

- Stage D (Class IIb)
  - Hemodynamic monitoring "tailored therapy"
  - Mitral valve repair or replacement for severe secondary MR
  - Continuous infusion of positive inotropic agent as palliative therapy

Recommendations for Treatment

- Stage D (Class III)
  - Partial Ventriculectomy (Batista procedure)
  - Routine intermittent infusions of positive inotropic agents
  - Implantation of ICD in patients with D-IV symptoms not anticipated to experience clinical improvement

Treatment of "Diastolic" HF

- Class I:
  - Control Hypertension
  - Control V-rate in a-fib
  - Diuretics to control congestive symptoms
- Class IIa:
  - Coronary revascularization in whom ischemia is judged to have an adverse effect on diastolic function
- Class IIb:
  - Restoration of NSR in a-fib
  - Use of beta-blockers, ACE inhibitors or calcium antagonists in patients with controlled hypertension
  - Use of Digitalis

HF Hospitalizations

- 70% due to worsening chronic heart failure
- 25% new onset heart failure
- 5% end stage heart failure
  - Refractory to therapy, with severe LV systolic dysfunction and low output state

ADHF Patient Characteristics

HF	ADHERE (n = 105,388)	OPTIMIZE (n = 48,612)
Age	72	73
% Male	50%	48%
Hx HF	75%	87%

ADHF Patient Characteristics

	ADHERE	OPTIMIZE HF
Low EF	54%	46%
CAD	57%	50%
AFib	31%	31%
Renal Insuf	30%	30%
Diabetes	44%	42%
SBP > 140	50%	48%
SBP < 90	3%	ND

ADHF Signs/Symptoms

	ADHERE	OPTIMIZE HF
• Dyspnea	89%	ND
• Dys at rest	34%	44%
• DOE	ND	61%
• Rales	68%	64%
• Edema	66%	65%

Ready for Discharge when…

- Exacerbating factors addressed
- Near optimal volume status achieved
- Successful completion of transition from IV to oral diuretics
- No IV vasodilators/inotropes for 24 hours
- Ambulation to evaluate functional status
- Patient and family education completed
- Plans for post-discharge management

Management of Heart Failure

- Traditional Management
  - Exacerbations, followed by quick follow up with cardiologists or PCP (average time face to face with provider is less than 15 minutes)
  - Suboptimal medicinal therapy
  - Minimal education of home management and monitoring

- Chronic Disease Management Model

Outpatient Heart Failure Centers

- Can be a cost effective model of care
- Education on self care/monitoring, with reinforcement at each visit
- Evaluation of barriers to optimal wellness
- Ready access for worsening of HF
- Aggressive treatment available at center for exacerbation

Goals of heart failure management

- Decrease hospitalizations and improve the quality of life of patients
- Systematic, evidence-based, comprehensive partnership with patients and their support people
- Staff needs to provide compassionate care and be patient advocates

Self Care/Monitoring

- Daily weight
- Monitoring for fluid retention
- Taking medications
- Following low sodium diet
- Staying physically active
- Avoiding illness (immunizations)
- Regular consulting with providers

Stages of self care/Monitoring

- Monitoring status change
- Recognizing status change
- Evaluating status change
- Taking action
- Implementing treatment strategy
- Evaluating treatment

Improved Self Care results in…

- Improvement in clinical outcomes
- Reduced health care costs

Characteristics affecting self care: *"Knowledge is necessary"*

- Age
- Psychosocial situation
- Health literacy
- Current symptoms
- Previous experiences
- Sleep
- Cognition

Interventions that Enhance Self Care

- Family support
- Simplification of self care as the person approaches the end of life

Failed self care

- Repeat hospitalizations have been attributed to failed self care, so to decrease hospitalizations focus on the improvement of self care
- Chronic disease model of heart failure management has a focus on self monitoring

Improved Outcomes

- Higher rates of evidence based treatment in the heart failure population (ACE/BB)
- Lower incidences of hospitalizations
- Improved quality of life of patients
- Increased knowledge of patients/families in home management of heart failure
- Increased patient and family satisfaction