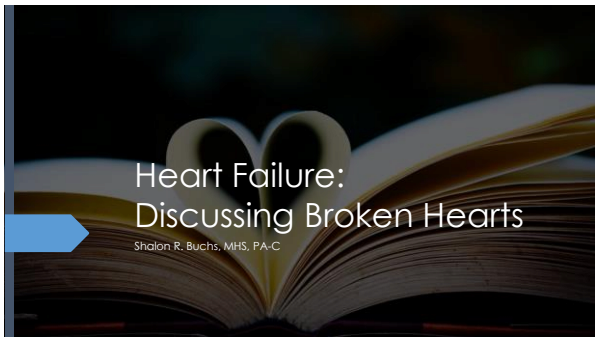

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Disclosures

Non-Declaration Statement:
I have no relevant
relationships with ineligible companies to
disclose within the past 24 months.

3

Objectives

- Outline the primary differences between acute and chronic heart failure.
- Recognize signs of poor prognosis in patients with heart failure.
- Discuss a management strategy for patients with advanced heart failure.

3

Epidemiology & Burden of disease

- Incidence and prevalence of HF increases with age.
- There are an estimated 6 million people with HF in the US.
- In 2014, there were 1,068,412 ED visits; 978,135 hospitalizations and 83,705 deaths attributed to primary HF.
  - The numbers for comorbid HF in the same year were at least tripled.
- Average hospitalization for a primary HF patient in 2014 was ~$11,552

4

Risk factors

- Coronary heart disease
- Cigarette smoking
- Hypertension
- Obesity
- Diabetes
- Valvular Heart disease

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HF – Major Categories

Heart Failure w/ Preserved Ejection Fraction (HFpEF)

- Symptoms
  - DOE, SOB, Fatigue
  - Edema- Ascites, JVD, Leg
- What is going on…
  - % of blood leaving ventricle normal (55-60%)
  - Blood volume leaving ventricle not enough for body needs
- Causes?
  - Problem filling (diastole)

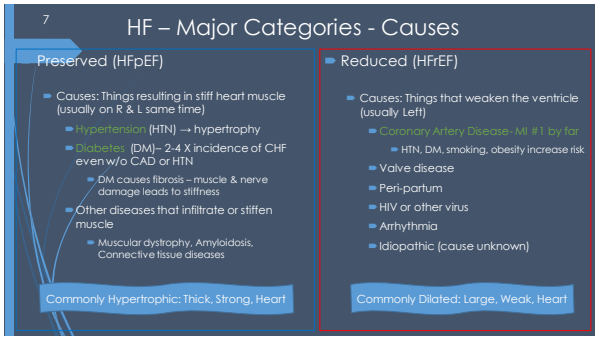
Heart Failure w/ Reduced Ejection Fraction (HFrEF)

Previously systolic and diastolic HF

- Symptoms
  - DOE, SOB, Fatigue
  - Edema- Ascites, JVD, Leg

Can't really tell the dif. by symptoms alone

- What is going on…
  - % of blood leaving ventricle reduced (Below 40%)
  - Blood volume leaving ventricle not enough for body needs
- Causes?
  - Problem pumping (systole)


7
HF – Major Categories - Causes
Preserved (HFpEF)
Causes: Things resulting in stiff heart muscle (usually on R & L same time)
Hypertension (HTN) → hypertrophy
Diabetes (DM)– 2-4 X incidence of CHF even w/o CAD or HTN
DM causes fibrosis – muscle & nerve damage leads to stiffness
Other diseases that infiltrate or stiffen muscle
Muscular dystrophy, Amyloidosis, Connective tissue diseases
Commonly Hypertrophic: Thick, Strong, Heart
Reduced (HFrEF)
Causes: Things that weaken the ventricle (usually Left)
Coronary Artery Disease- MI #1 by far
HTN, DM, smoking, obesity increase risk
Valve disease
Peri-partum
HIV or other virus
Arrhythmia
Idiopathic (cause unknown)
Commonly Dilated: Large, Weak, Heart

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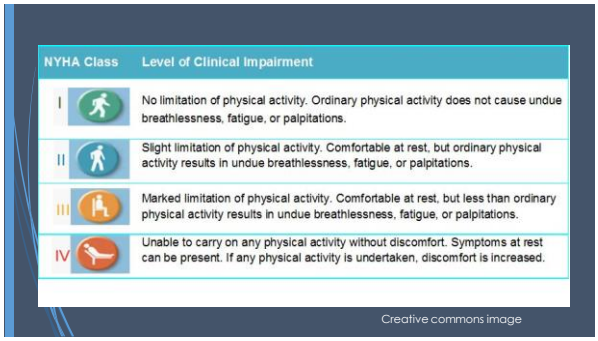
NYHA Class
Level of Clinical Impairment
I
No limitation of physical activity. Ordinary physical activity does not cause undue breathlessness, fatigue, or palpitations.
II
Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in undue breathlessness, fatigue, or palpitations.
III
Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in undue breathlessness, fatigue, or palpitations.
IV
Unable to carry on any physical activity without discomfort. Symptoms at rest can be present. If any physical activity is undertaken, discomfort is increased.
Creative commons image

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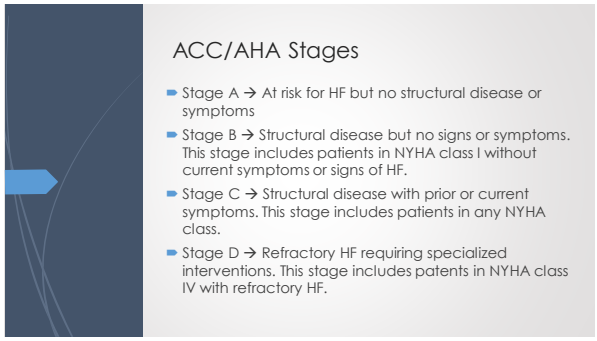
ACC/AHA Stages
Stage A → At risk for HF but no structural disease or symptoms
Stage B → Structural disease but no signs or symptoms. This stage includes patients in NYHA class I without current symptoms or signs of HF.
Stage C → Structural disease with prior or current symptoms. This stage includes patients in any NYHA class.
Stage D → Refractory HF requiring specialized interventions. This stage includes patents in NYHA class IV with refractory HF.

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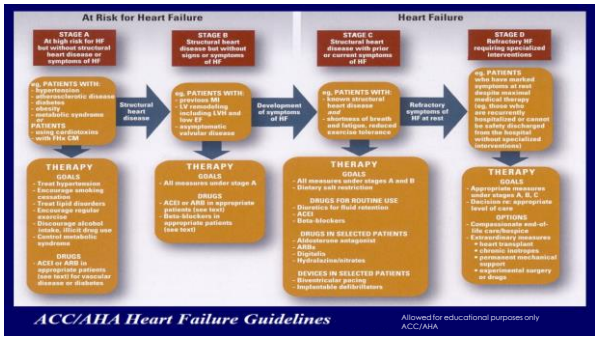
At Risk for Heart Failure
Heart Failure
STAGE A
At high risk for HF but without structural heart disease or symptoms of HF
STAGE B
Structural heart disease but without signs or symptoms of HF
STAGE C
Structural heart disease with prior or current symptoms of HF
STAGE D
Refractory HF requiring specialized interventions
Structural heart disease
Development of symptoms of HF
Refractory symptoms of HF at rest
THERAPY
GOALS
DRUGS
DRUGS FOR ROUTINE USE
DRUGS IN SELECTED PATIENTS
DEVICES IN SELECTED PATIENTS
OPTIONS
ACC/AHA Heart Failure Guidelines
Allowed for educational purposes only
ACC/AHA

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11
Treatment strategies
Improve symptoms
Reduce morbidity and morality
Lifestyle
Medication
Multidisciplinary treatment
Palliative care, +/- hospice

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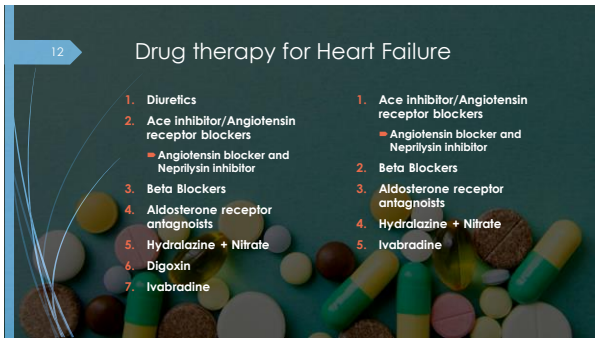
12
Drug therapy for Heart Failure
1. Diuretics
2. Ace inhibitor/Angiotensin receptor blockers
Angiotensin blocker and Neprilysin inhibitor
3. Beta Blockers
4. Aldosterone receptor antagnoists
5. Hydralazine + Nitrate
6. Digoxin
7. Ivabradine
1. Ace inhibitor/Angiotensin receptor blockers
Angiotensin blocker and Neprilysin inhibitor
2. Beta Blockers
3. Aldosterone receptor antagnoists
4. Hydralazine + Nitrate
5. Ivabradine

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More than medication

- HF clinics, when available, are an important consideration
- Cardiac Rehab
  - Indicated for most HF patients (both types)
    - Approved for payment by all payers (Medicare, Medicaid and third party
- Utilization rates are low

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Acute Heart Failure

- Results from HFpEF or HFrEF
- Diagnosis is clinical; can be supported with test results
- Admission to the hospital is common

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Common presentation - ADHF

- Acute dyspnea, orthopnea, tachypnea, tachycardia, HTN
- Hypotension in severe disease
- Accessory muscle use
- Diffuse pulmonary crackles, possible wheezing
- Elevated JVD, peripheral edema, an S3

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Management - ADHF

- Identify and treat underlying cause
- Treat hypoxia if present - assisted ventilation if needed
- Diuresis
- Consider afterload reduction
- If known HFrEF and appear to be in cardiogenic shock → D/C BB, Give IV inotrope and/or mechanical support
- If known HFpEF and appear to be in cardiogenic shock → IV fluid (unless pulmonary edema present) and give IV vasopressor (not inotrope) If outflow obstruction is suspected BB may be indicated
- If unknown → Give inotrope with or without vasopressor, assess for mechanical support

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Pharmacotherapy for Heart Failure: Summary

Chronic HF

- Focus on maintenance of fluid, electrolyte status & hormone blocking
- Drugs that reduce morbidity & mortality
  - Beta Blocker
  - ACE – inhibitor, ARB, ARNI
  - Aldosterone antagonists - if EF below 35%

Acute HF

- Focus on restoration of normal perfusion and relief of congestion.
- Need drugs that work fast & reduce symptoms.
  - Diuretics – Loop (furosemide)
  - Pressors/Inotropes – (Dopamine, Dobutamine, others) – for perfusion
  - Change high dose IV meds for acute failure, to doses that are oral and lower potency when ready for discharge

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Prognostic indicators for HF patients

- Age
- NYHA classification
- Comorbid conditions
- Ejection fraction
- Right ventricular function
- Low peak VO2 with exercise
- Low heart rate response to exercise
- Sinus tachycardia at rest
- Low mean arterial pressure
- Increased pulse pressure
- Decreased HR variability
- Renal insufficiency
- Hyponatremia
- Lymphopenia
- Elevated ESR and CRP

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Physical findings in advanced HF

- Volume markers
  - S3, Elevated JVP, RUQ tenderness
- Mitral regurgitation
- Narrow pulse pressure and reduced HR variability
- Weight loss

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Heart Failure - Natural History

- 6 mil Americans, 3% of general population, 20% of elderly
- $40 Billion in annual health care costs
- Survival: **Average 16 months from first hospitalization**

NYHA CHF Class	1 yr Mortality
I - Mild	5-10%
II-III - Moderate	15-30%
IV - Severe	50-60%

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Predictive models

- Get with the guidelines (GWTG) score
  - Intended for hospitalized patients
- Seattle Heart Failure Model (SHFM)
- Meta-Analysis Global Group in Chronic HF (MAGGIC)
  - Any pt. with HF, use with caution in HFrEF

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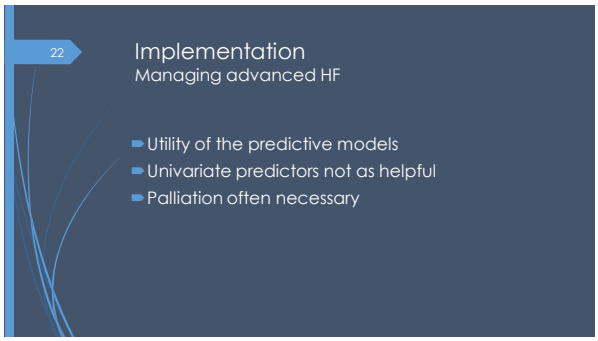
22
Implementation
Managing advanced HF
Utility of the predictive models
Univariate predictors not as helpful
Palliation often necessary

22


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Decision making
Underlying etiology
Hospitalization
Age
Gender
Race
Effects of treatment
ACE Inhibitors
Comprehensive therapy

23


Planning in CHF
Only 4% of patients with advanced HF get palliative care
40% in cancer
Patients w/ condition who have a Do not resuscitate (DNR) order:
47% in Cancer
5% in CHF

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Primary palliative care

- Dyspnea
- Pain
- Fatigue
- Mental health
- Clarity about prognosis
- Goals
- Shared decision making
- Advanced directives

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At a minimum, when do Primary Care providers...

Referrals for Advanced Heart Failure: *Do*s and *Don't*s

- Do:
  - Discuss and consider advanced HF therapies when class III
    - Hyponatremia (NA <136)
    - BUN >45, Crea >2.5
    - BNP >4x upper normal limit
    - Diuretic dose >2.0 mg/kg/dl
    - Inability to take ACE/ARB/BB
  - Consider if frequent arrhythmia
- Don't:
  - Wait for progressive renal dysfunction
  - Wait for multiple pressors
  - Wait for cardiac cachexia

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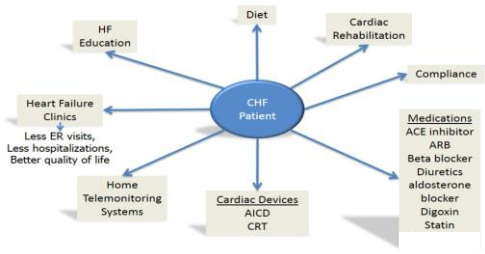
Successful Treatment of Congestive Heart Failure = Complex Multidisciplinary Management Strategy



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Take home points

- Acute HF is a clinical syndrome of new or worsening signs and symptoms
- ACE I, ARB, ARNI; BB; Aldosterone antagonists are known to impact survival
- Many factors influence HF prognosis: age, NYHA, EF, comorbidities, renal fxn, electrolyte levels (Na+ in particular) and others
- Predictive models can be useful to initiate conversations with patients
- Offer palliative care and consider a multidisciplinary approach in advanced HF patients

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Thank you!

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