HEART FAILURE (CHF)

1. Echocardiography is essential in initial evaluation of heart failure.
2. 50% of patients with CHF symptoms have heart failure with preserved systolic function.
3. Patients presenting to the ER with acute dyspnea and BNP < 100 pg/mL are unlikely to have acute CHF.
4. Routine labs obtained in initial evaluation of CHF patients includes electrolytes, renal & hepatic function, blood counts; if indicated, assessment for thyroid abnormalities or hemochromatosis.
5. BNP is not a reliable measure of severity of chronic heart failure.
6. Evaluation for ischemia should be part of the initial evaluation for most patients with new-onset or worsening CHF.
7. Coronary angiography should be considered for patients who have chest pain and unknown coronary anatomy, or known or suspected coronary disease, with no contraindications to revascularization.
8. Cardiac biopsy is rarely diagnostic due to heterogeneous myocardial involvement. It is indicated in unexplained new-onset CHF (2 wks – 3 months) plus cardiogenic shock, ventricular arrhythmias, second or third-degree AV block, or failure to respond to usual care within 1 – 2 wks. It is reasonable in suspected treatable cause of CHF.
9. ACEi (or ARBs) & β-blockers are indicated for any NYHA class of systolic CHF, including asymptomatic patients.
10. If contraindications, such as renal failure or hyperkalemia, are present, hydralazine/isosorbide dinitrate combination is a suitable alternative to an ACE inhibitor or ARB.
11. β-Blockers are started once euvolemia/ near-euvolemia is achieved. They are continued during decompension, unless there is end-organ hypoperfusion or IV vasoactive meds are needed.
12. Spironolactone is indicated for NYHA III-IV CHF patients with acceptable serum Cr & K levels; mainly for improving survival.
13. In black patients with NYHA III-IV CHF, hydralazine/isosorbide dinitrate should be added to standard therapy.
14. Digoxin is used in NYHA III – IV CHF for symptoms. Low (0.5–0.8) is as effective as high (≥1.2 ng/mL) levels with less toxicity & mortality.
15. Diuretic resistance can be treated by fluid (≤ 2 L/d) & sodium (2g/d) restriction, change in diuretic route & timing, diuretic combination & use of more bioavailable diuretics (torsemide, bumetnide).
16. Amlodipine & felodipine are the only CCBs with neutral effects on mortality in CHF. Other CCBs increase decompensation & mortality.
17. ICD is indicated for primary prevention of sudden cardiac death in the setting of symptomatic ischemic & nonischemic CM.
18. Cardiac resynchronization (biv pacing) improves functional status & survival with ventricular dyssynchrony (QRS>120msec) & NYHA III-IV.
19. Inability to walk > 300 meters in a 6-min walk test is associated with a 3 – 4 fold increased risk of death in chronic CHF patients.

20. Ongoing assessment is needed of factors that may exacerbate CHF, such as HTN, ischemia, arrhythmia, obesity, meds & noncompliance.
21. EF reassessment with echo is most useful when there is a change in clinical status, not at regular or arbitrary intervals.
22. The Seattle Heart Failure Model provides an individualized risk assessment for ambulatory patients with systolic CHF.
23. CHF decompensation causes include dietary & med noncompliance, new-onset afib or ischemia; and intervening illness.
24. In critical patients, right heart cath is useful to clarify volume status & cardiac output; esp. with low BP, high Cr, & shock symptoms, when empiric diuresis would be limited by BP and renal function.
25. In long-standing HF, physical exam may be confusing or unrevealing, e.g. absent pulmonary crackles, despite actual decompensation.
26. Severe CHF patients should be referred for cardiac transplant or LVAD if they have refractory HF despite medical & device therapy.
27. In end-stage CHF when further active therapies are not options, due to medical contraindication, futility, or patient desire, end-of-life issues should addressed, including advanced directives and hospice care; this should not preclude use of IV agents or diuretics for symptom palliation. ICD Deactivation should be recommended.
28. Heart failure with preserved systolic function treatment focuses on controlling exacerbating factors, e.g. ischemia, HTN & tachycardia, plus managing symptoms of pulmonary and peripheral congestion.
29. In Africa, CM is mostly nonischemic (DCM, rheumatic, & peripartum) In North America & Europe 50 – 75% results from CAD & HTN.
30. Takotsubo CM (transient LV apical ballooning, stress-induced cardiomyopathy) occurs with emotional or physiologic stress, causes dilation and akinesis of the LV apex and mid-ventricle, which usually resolves in days to weeks with supportive care. Mortality is low.
31. Acute myocarditis is due to immune-mediated myocardial damage; may be asymptomatic or cause cardiogenic shock. Troponins are elevated; LV dysfunction is global or regional. Therapy is CHF care. Corticosteroids & immunosuppressive therapy is controversial.
32. Tachycardia-mediated CM may be due to SVT or VT; treatment is to slow or eliminate arrhythmia (rate or rhythm control/ablation); treat underlying conditions, e.g. hyperthyroidism. Tachycardia resolution causes myocardial structure & function recovery in wks to months.
33. Arrhythmogenic RV dysplasia is fibrofatty infiltration of the RV on biopsy or MRI, with significant RV enlargement and dysfunction and preserved LVEF. Sudden death may be initial presentation. 50 – 60% of patients die of progressive heart failure.
34. Giant cell myocarditis is rare marked biventricular enlargement with refractory ventricular arrhythmias, usually in young/middle-aged adults. Presents as cardiogenic shock; 90% short & intermediate mortality. Cardiac transplant is treatment; but disease may recur.

Clinical Stages of Chronic Heart Failure

ACC/AHA Stage	NYHA Functional Class	Estimated 1-Year Mortality
A At risk; no structural disease or symptoms	—	*See note*
B Structural disease but no symptoms	**I** Asymptomatic	5%–10%
C Structural disease with prior or current symptoms	**II** Symptomatic; slight limitation of physical activity	15%–30%
	III[a] Symptomatic; marked limitation of physical activity	15%–30%
D Refractory disease	**III**[a] Symptomatic; marked limitation of physical activity	15%–30%
	IV Inability to perform any physical activity without symptoms	50%–60%

[a]NYHA class III overlaps with ACC/AHA stages C and D.

Note: Mortality in Stage A is that associated with any existing comorbid conditions.

Medical Therapy for Systolic Heart Failure by Functional Status

Initial Therapy

All NYHA classes (I-IV):

ACE inhibitor (if ACE inhibitor is not tolerated because of cough, an ARB can be used; if ACE inhibitor is contraindicated because of hyperkalemia or renal insufficiency, hydralazine/isosorbide dinitrate can be used)

β-Blocker

Additional Therapy

NYHA class I-II (asymptomatic or mild symptoms):

Diuretic as needed to maintain euvolemia

NYHA class III-IV (moderate to severe symptoms):

Spironolactone (if bothersome side effect of gynecomastia occurs, eplerenone can be used)

For black patients, hydralazine/isosorbide dinitrate

Digoxin

Diuretic as needed to maintain euvolemia

Indications for Device Therapy in Heart Failure

Implantable Cardioverter-Defibrillator

NYHA class II or III while on optimal medical therapy *and*

Expectation of survival >1 year *and*

Either of the following:

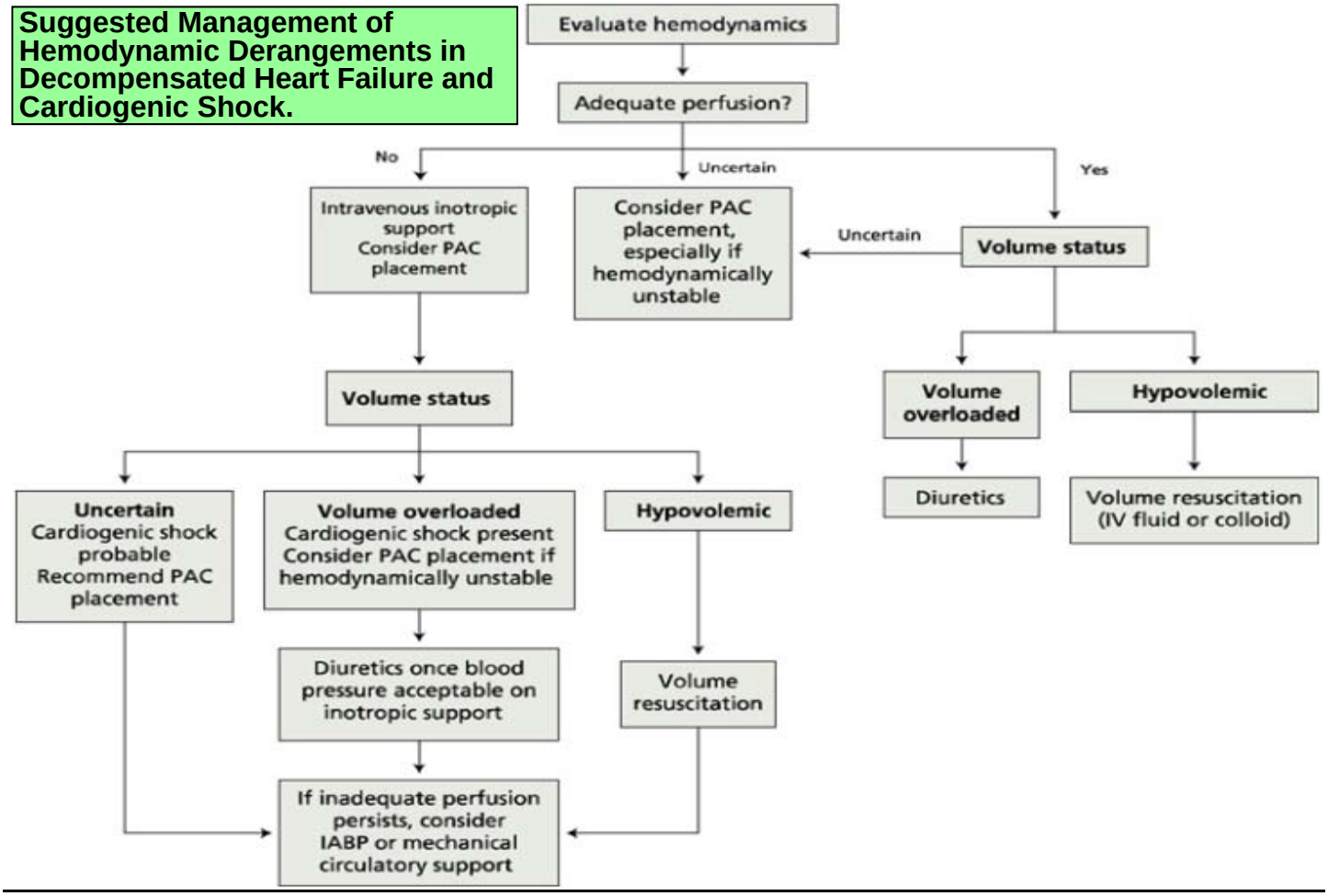
- Ischemic or nonischemic cardiomyopathy with ejection fraction ≤35% (primary prevention)
- History of hemodynamically significant ventricular arrhythmia or cardiac arrest (secondary prevention)

Cardiac Resynchronization Therapy

All of the following:

- NYHA class III or IV
- Ejection fraction ≤35%
- Ventricular dyssynchrony (QRS >120 msec, left bundle branch block)

Suggested Management of Hemodynamic Derangements in Decompensated Heart Failure and Cardiogenic Shock.



Indications & Contraindications for Cardiac Transplant or Ventricular Assist Device

Indications (Any of the Following; in the Absence of Contraindications)

Refractory cardiogenic shock

Dependence on intravenous inotropic support to maintain adequate organ perfusion

Severely limited functional capacity despite optimal medical therapy (peak Vo_2 <10-14 mL/kg/min)

Severe ischemia despite optimal medical therapy that consistently limits routine activity and is not amenable to percutaneous or surgical revascularization

Recurrent significant ventricular arrhythmias refractory to optimal therapies

Insufficient Indication Alone

Low ejection fraction

History of New York Heart Association class III or IV symptoms

Potential Contraindications (Center-Specific)

Diabetes with end-organ damage, such as nephropathy or retinopathy

Major chronic disabling illness, such as systemic lupus erythematosus or severe arthritis

Severe pulmonary hypertension

Severe peripheral vascular disease

Active infection

Significant chronic and likely irreversible functional impairment of other vital organs, such as renal failure, cirrhosis, or chronic obstructive pulmonary disease

Active substance abuse, including smoking

Obesity

Current mental or psychosocial instability

Active or recent malignancy