O My Achy Heart
Care of the Heart Failure Patient

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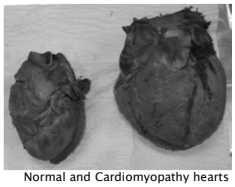
Cardiomyopathy vs Heart Failure

Cardiomyopathy	Heart Failure
▸ Primary disorder of cardiac muscle causing abnormal myocardial performance ◦ Heterogeneous group of diseases of the myocardium. ◦ Disease that affects primarily the myocardial layer ◦ Associated with mechanical and/or electrical dysfunction ◦ Usually exhibits ventricular hypertrophy or dilation ◦ Often leads to progressive heart failure	▸ Complex clinical syndrome ◦ Develops from any cardiac disorder that impairs the ability of the ventricle to fill or eject adequately ◦ Pathologic state in which the heart is unable to pump enough oxygenate blood to meet the metabolic needs of the body

Cardiomyopathies

- Primary disorder of cardiac muscle causing abnormal myocardial performance
- Not the result of disease or dysfunction of nonmuscular cardiac structures
- Excludes:
  - Myocardial infarction
  - Hypertension
  - Valvular Disease



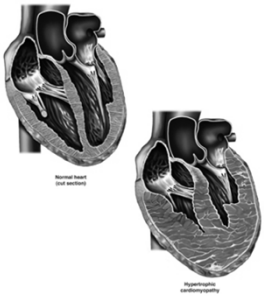
Normal and Cardiomyopathy hearts

Cardiomyopathies

- Hypertrophic
- Dilated (ischemic and nonischemic)
- Stressed Induced (Takotsubo)
- Restrictive *

* Not on CMC test blue print

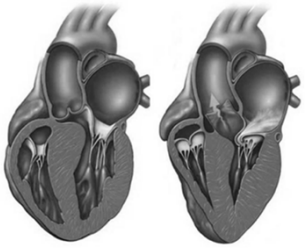
Hypertrophic Cardiomyopathy (HCM)



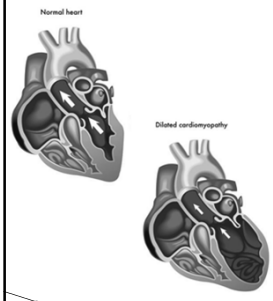
- Myocardial hypertrophy without the presence of associated hemodynamic stress (no ↑ in afterload)
- Hypertrophy of the heart muscle including the septum and ventricular free wall
- Previously called IHSS – idiopathic hypertrophic subaortic stenosis
- Leading cause of death in athletics < 35 y/o

Hypertrophic Obstructive Cardiomyopathy (HOCM)

- Subgroup of patients with HCM develop obstruction
- Once obstruction occurs it is called: Hypertrophic obstructive cardiomyopathy (HOCM)



Dilated Cardiomyopathy



- Enlarged, dilated cardiac chamber
- Can affect one or all four chambers
- As chamber enlarges, its ability to contract becomes impaired, resulting in systolic dysfunction
- Most common cause of HF

Physiologic Changes in Dilated Cardiomyopathy

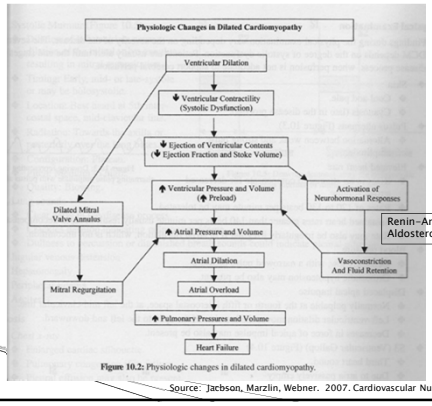


Figure 10.2: Physiologic changes in dilated cardiomyopathy.

Source: Jacbson, Marzlin, Webner. 2007. Cardiovascular Nursing Practice.

Dilated Cardiomyopathy

Causes

- Idiopathic
- Valvular
- Genetic
- Ischemic
- Hypertensive
- Myocarditis (Infection/Inflammatory)
- Chemotherapy
- Periparium syndrome related to toxemia
- Cardiotoxic effects of drugs or alcohol

Idiopathic Dilated Cardiomyopathy (IDC)

Causes	Treatment
50% of IDC is familial Suspected when other causes are excluded ◦ CAD ◦ Thyroid disease ◦ Valvular abnormalities ◦ Infiltrative causes ◦ Hypertension ◦ Alcohol	ACE inhibitors Beta blockers Anticoagulation is required due to the risk of thromboembolism Improvement of LV function is often better in IDC than in patients with IDM (ischemic dilated cardiomyopathy)

Ischemic Dilated Cardiomyopathy (IDM)

Causes	Treatment
Most common type of dilated cardiomyopathy Occurs when CAD or ischemic heart disease causes remodeling of the LV with an associated reduction of EF Remodeling is the compensatory response of the ventricles to improve its function. ◦ Harms ventricular muscle ◦ Worsens stroke volume ◦ Develops ventricular dilation ◦ Decreases EF	ACE inhibitors Beta blockers Diuretics/spironolactone Anticoagulation is required due to the risk of thromboembolism ICD Amiodarone to prevent dysrhythmias Monitor electrolytes Prognosis is worse for IDM than nonischemic cardiomyopathy.

Treat ischemic disease – prevent remodeling with ACEI & BB

Hypertensive Dilated Cardiomyopathy

Causes	Treatment
Diagnosed when systolic function remains depressed despite adequate treatment of hypertension Myocardial systolic function is depressed out of proportion to the increase in wall stress Prognosis is influenced by other comorbitities	Same as IDM (ischemic) Afterload reduction is the most important goal Antihypertensive vasodilators ◦ Amiodipine (Norvasc, besylate, mesylate or maleate) Alpha-blocking agents ◦ Alfuzosin (Uroxatral) ◦ Doxazosin (Cardura) ◦ Prazosin (Minipress) ◦ Terazosin ◦ Tamsulosin (Flomax)

Afterload reduction – Alpha-blocking agents

Valvular Dilated Cardiomyopathy

Causes	Treatment
▸ Myocardial systolic function is depressed out of proportion to the increase in wall stress secondary to valvular abnormalities ▸ Most caused by left sided valves ◦ MR & AR ◦ AS less common cause	▸ Valve replacement or repair – improves wall stress but not depressed LVF ▸ ACEI & BB ▸ Aggressive afterload reduction ◦ Hydralazine ◦ Nitrates ▪ nitroglycerin, isosorbide dinitrate, isosorbide mononitrate. ▸ With AR– calcium channel blockers

Valve repair --Afterload reduction: hydralazine & nitrates

Peripartum Dilated Cardiomyopathy

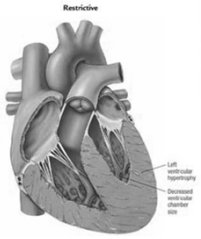
Causes	Treatment
▸ Occurs when myocardial systolic dysfunction occurs during the last trimester of pregnancy or within 6 months of childbearing. ▸ Outcomes are better with peripartum than with other dilated cardiomyopathies	▸ Treatment is aggressive & consistent with IDC (idiopathic) ▸ 50% will recover completely ▸ Small minority will need transplant

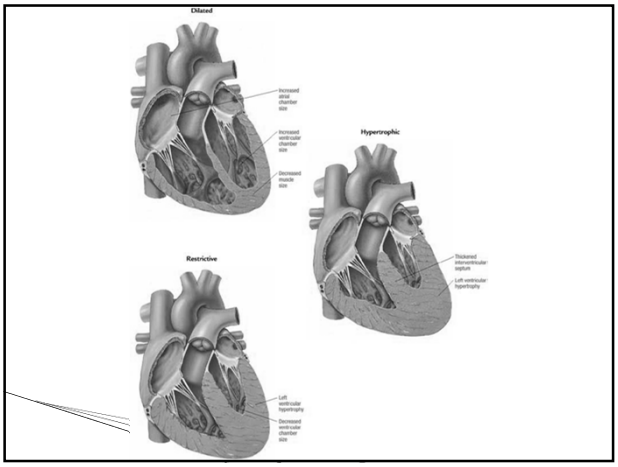
Alcohol-Related Dilated Cardiomyopathy

Causes	Treatment
▸ Diagnosed when there is a history of sustained and heavy alcohol consumption and other causes of dilated cardiomyopathy are excluded. ▸ Toxic effects of alcohol are thought to cause the nonspecific changes in the myocardium ▸ Thiamine deficiencies can compromise cardiac function	▸ Alcohol abstinence ▸ Same as for IDC (idiopathic) ▸ Prognosis is somewhat better than for IDC depending on the degree of myocardial impairment and alcohol abstinence

Restrictive Cardiomyopathy (RC)

- Restrictive filling and reduced diastolic volume of either or both ventricles
- Least common cardiomyopathy (5%)





Cardiomyopathy vs Heart Failure

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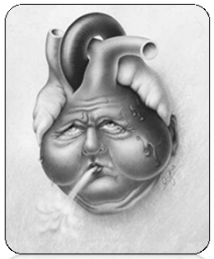
Heart Failure

- Syndrome preceded by an initiating cardiovascular event (MI, hypertension, etc)
- On the cardiac continuum HF is an end event – represents the most severe manifestation of cardiovascular disease



Chronic Disease

- One in Five HF patients will die within 1 year of diagnosis of HF
- 50% Heart Failure Patients die within 5 years of HF diagnosis
- HF afflicts 10 out of every 1,000 over age 65 in the U.S.[2]
- #1 Admission Diagnosis to the Hospital for patients over 65.

Heart Failure

Characteristics

1. Arises from alterations in systolic and diastolic dysfunction
   - Systolic Dysfunction
   - Diastolic Dysfunction
2. Systolic and Diastolic Dysfunction are progressive syndromes that develop over the course of many years
3. Heart Failure preferred term
   - Not all HF patients (especially those with diastolic dysfunction) exhibits symptoms of congestion)

HF is a progressive syndrome --- develops over many years

Acute Exacerbation vs Chronic HF

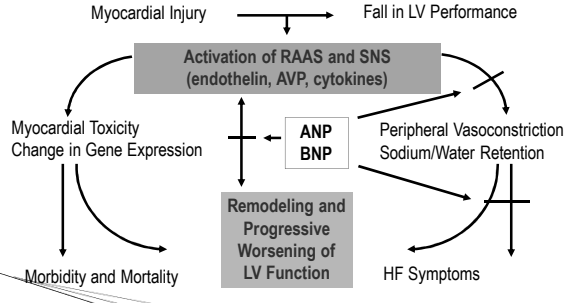
Acute HF	Chronic HF
▸ Also called: Decompensated HF ▸ New or worsening signs and symptoms of the HF syndrome ▸ Frequently leads to ED visits or hospitalization ▸ May also be: Sudden onset of HF signs and symptoms that occur in patients with no previous HF history	▸ Denotes the slow progression and continuance of the HF syndrome ▸ Chronic HF patients frequently experience "*exacerbations of HF*" also known as acute HF or decompensated HF

Etiology of Heart Failure

What causes heart failure?

- The loss of a critical quantity of functioning myocardial cells after injury to the heart due to:
  - Ischemic Heart Disease
  - Hypertension
  - Idiopathic Cardiomyopathy
  - Infections (e.g., viral myocarditis, Chagas' disease)
  - Toxins (e.g., alcohol or cytotoxic drugs)
  - Valvular Disease
  - Prolonged Arrhythmias

Pathophysiology of HF

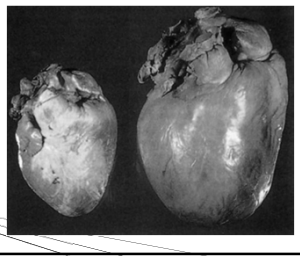


Shah M et al. *Rev Cardiovasc Med*. 2001;2(suppl 2):S2.

Compensatory Mechanisms

- End result of body's attempt to compensate….

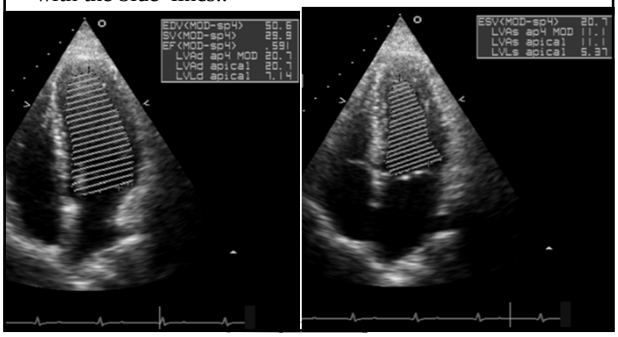
Ventricular Remodeling



Standard Testing for HF

- Echocardiogram
- Lab: BNP, CMP, CBC, TSH, Cardiac enzymes
- Chest Xray
- Coronary angiogram (left heart catheterization)

An echocardiogram is a procedure used to visualize the pumping action of the heart. The EF is calculated by measuring the ventricle in systole and diastole as noted with the blue lines..



Ejection Fraction

- The amount of blood leaving the heart with each contraction.
- The amount ejected is measured as a fraction of the total amount of blood in the heart at the beginning of contraction.
- Normal is 55-75%.
  - EF < 40 % = needs ACE I/ARB
  - EF < 30% = poor outcomes
  - EF < 18% = transplant

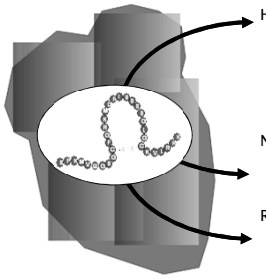
BNP Test (Brain Natriuretic Peptide)

- Measures concentration of BNP in blood
- BNP increases in response to LV dysfunction
- Normal = 38 $\pm$ 4
- Screen for HF
  - If BNP > 80 - 100 have HF
  - If BNP < 80 = respiratory problem
- Monitor effects of medication
  - BNP Greater than 400 admit to hospital

BNP

- BNP is manufactured in the ventricles
- BNP is a natural hormone that is released in response to a distended, overloaded ventricle to maintain normostasis.
- BNP counteracts the RAA system
- The more compensated the heart is the more the RAAS is activated.
- The more the RAAS is activated the more BNP released to counteract
- The higher the BNP, the harder the ventricles are working to counteract the RAAS

Pharmacological Actions of hBNP



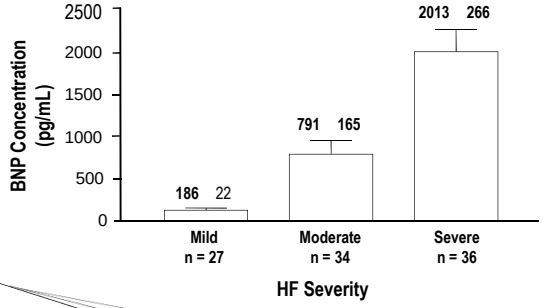
Hemodynamic
(balanced vasodilation)
- veins
- arteries
- coronary arteries

Neurohormonal
- ↓↓aldosterone
- ↓norepinephrine

Renal
- ↑diuresis & natriuresis

Abraham WT and Schrier RW, 1994

BNP Concentration and Degree of HF Severity

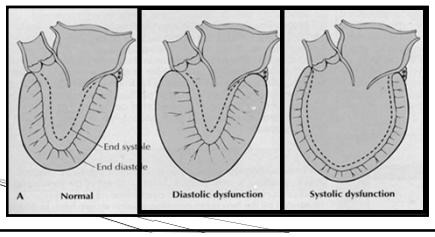


Dao Q et al. *J Am Coll Cardiol*. 2001;37:379.

Types of heart failure

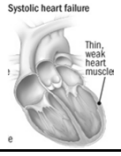
Diastolic Dysfunction
- **Heart failure symptoms with EF ≥ 40%**
- **Hypertrophic CMP, HTN, Ischemia, Age**
- **Imbalance in volume/ pressure relationship**

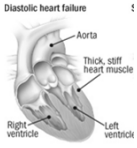
Systolic Dysfunction
- **Depressed contractility EF ≤ 40%**
- **CAD, Valve disease, Ischemic and Idiopathic CMP**

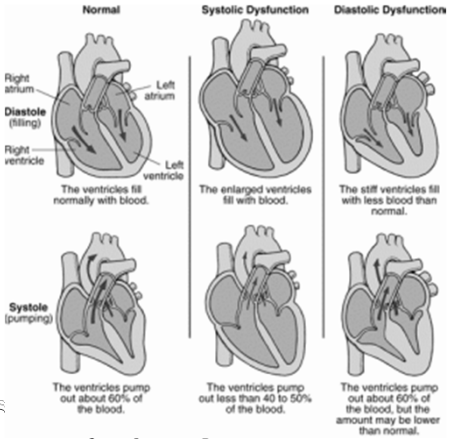


Systolic vs Diastolic HF

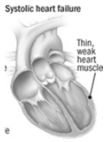
Systolic HF	Diastolic HF
▸ Inability of LV to contract against a load and eject blood into the aorta	▸ Abnormalities of diastolic filling or relaxation of the LV
▸ Hallmark signs: ◦ Reduced ejection fraction (EF) ◦ Reduced stroke volume	▸ Hallmarks signs ◦ Normal EF ◦ Abnormal diastolic function







Systolic Dysfunction

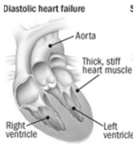


Pathophysiology

1. LV wall thins and the cavity dilates (eccentric hypertrophy)
2. Thin, dilated ventricle unable to contract effectively
3. EF decreases
4. Leads to ↓ CO, ↑ LVEDV, ↑ preload → pulmonary congestion
5. Dilated cardiomyopathy common cause of systolic HF
6. Cardiomyopathy and systolic dysfunction should NOT be used interchangeably

1. EF < 40% systolic dysfunction

Diastolic Dysfunction



Pathophysiology

1. Ventricular muscle thickens (concentric hypertrophy)
2. Ventricular cavity size may remain normal or become smaller
3. Noncompliant ventricle unable to relax, impairing filling
4. To ↑ filling, left atrial pressure ↑; leading to pulmonary congestion

1. EF normal in diastolic dysfunction

Diastolic Dysfunction

Clinical Presentation

- Symptomatic with exertion and ↑ HR
  - Faster HR ↓ filling time & ↓ CO
  - Exercise → ↑ catecholamines → ↑ HR → worsens diastolic function
  - Flash pulmonary edema can develop during periods of ischemia

Elevated heart rate worsens diastolic function

Diastolic Dysfunction

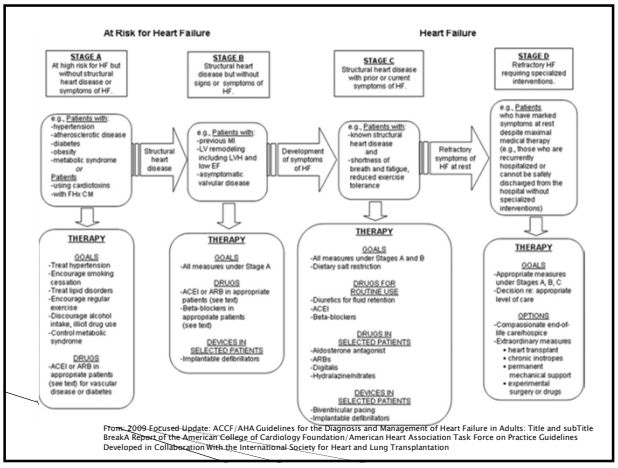
Diagnosis

- Three conditions required:
  1. Signs and symptoms of HF
  2. Normal or only slightly decreased EF
  3. Increased diastolic filling pressures and abnormal relaxation of LF
- Diagnosis made in patients presenting with the clinical syndrome of HF with no evidence of systolic dysfunction

1. Commonly associated with chronic hypertension or ischemic heart disease

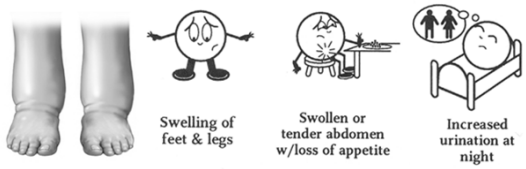
New York Heart Association (NYHA) Classification of Heart Failure

Class	Patient Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).
Class IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea) are present at rest. If any physical activity is undertaken, discomfort increases.

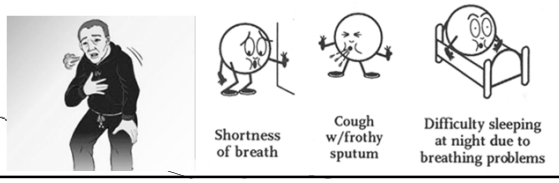


From 2009 Focused Update: ACCF/AHA Guidelines for the Diagnosis and Management of Heart Failure in Adults: Title and subTitle BreakA Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the International Society for Heart and Lung Transplantation

Right sided symptoms – think Circulation



Left sided symptoms – think Lungs



Right Ventricular Failure

Causes

- Usually results from prolonged LV failure
- Right ventricular MI or inferior wall MI
- Primary pulmonary hypertension
- Acute or chronic lung disease
- Chronic severe tricuspid regurgitation

Your patient has an

S 3

Neurohormonal Responses in HF

1. **Activation of Sympathetic Nervous System (SNS)**
2. **Renin-Angiotensin-Aldosterone System (RAAS) Kicks in…**

SNS Activation

↓ Cardiac Output
↓
Activates SNS
↓

Compensates by releasing neurohormones (Norepinephrine, Aldostrone, Vasopression)
↓
Sodium & Water Retention
↓
Congestion

↓
Vasoconstriction
↑ Afterload

Tachycardia
↓
↑ Myocardial Oxygen Time
↓ Diastolic Filling Time

Renin-Angiotensin-Aldosterone System (RAAS)

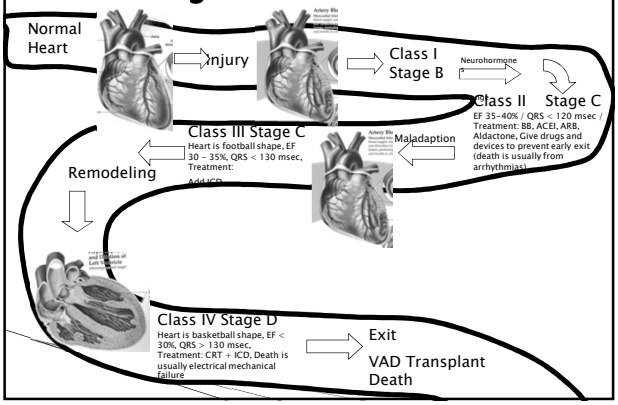
Low Cardiac Output/Hypotension/Hypovolemia
Decreased Renal perfusion
↓
Afferent Arteriole (baroreceptors)
↓
Release Renin (a messenger)
↓
Go to Liver to stimulate Angiotensin I production
↓
Angiotensin I goes to the Lung
↓
Angiotension Converting Enzyme (ACE) located in the pulmonary vascular membrane
↓
Converts Angiotensin I to Angiotensin II
↓
Angiotensin II

↓ Growth Factor

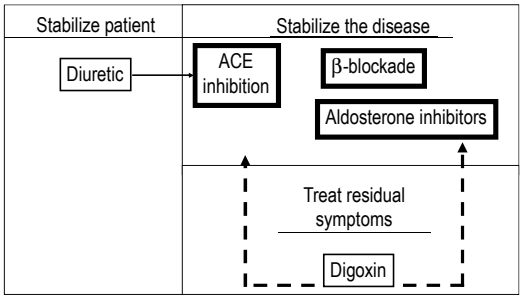
↓ Potent Vasoconstrictor
↓
Increases B/P
↓
Increases SVR

↓ Adrenal Cortex
↓
Aldosterone
↓
Distal Renal Tubule
↓
Increases H2O & Na++ Reabsorption
↓
Excretes K+ for Na+

Clinical Progression of Heart Failure



Paradigm for Outpatient Management of Heart Failure



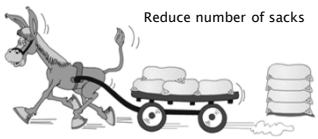
Adapted from Packer M, Cohn JN; eds. *Am J Cardiol*. 1999;83(Suppl 2A).

Heart Failure

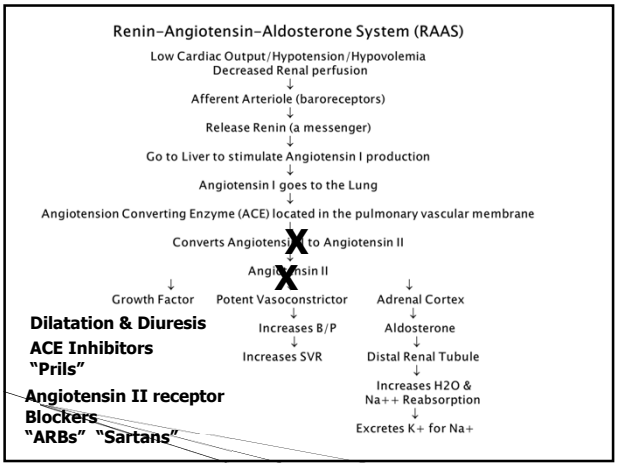
Pharmacological Treatment

- Three primary goals of medical treatment
1. Reduce preload
2. Reduce afterload
3. Increase contractility

Reduce Preload



- Diuretics
- Venous Vasodilators
  - ACE (Angiotension-converting enzyme) Inhibitor
    - Blocks the RAAS effect of reaborption of sodium and water and thus decreases volume overload
  - Aldosterone antagonists
    - Spironolactone & eplerenone
    - Added to increase diuretic effect if symptoms at rest
  - Nitrates
    - Dilates veins, allowing more blood to remain in the vascular system and sending less to the heart



ACEI: Therapeutics

- Contraindications:
  - history of angioedema, hyperkalemia, creatinine >3.0
- Complications:
  - hyperkalemia, worsening renal failure, cough, dysgeusia, angioedema
- Patient education:
  - check BP & call in, report dizziness, orthostasis, syncope, or lip swelling, take separately from beta blocker dose

ACE Inhibitors "Prils"

•Benazepril	Lotensin
•Captopril	Capoten
•Lisinopril	Zestril
	Prinivil
•Quinapril	Accupril
•Ramipril	Altace

ARBs: Benefits in HF

- Prevent remodeling after MI; reduce LV dilation & scar thinning
- Reduce cytokine levels
- May additively attenuate neurohormonal levels when combined with ACEI therapy

ARBs "Sartans"

•Candesartan	Atacand
•Irbesartan	Avapro
•Losartan	Cozaar
•Valsartan	Diovan
•Telmisartan	Micardis
•Eprosartan	Teveten

ARBs: Therapeutics

- Contraindications
  - hyperkalemia, history of angioedema, creatinine >3.0
- Complications
  - angioedema, headache, dizziness, hyperkalemia
- Patient education
  - similar to ACEI

Aldosterone Antagonists

- Spironolactone and Eplerenone
- Data:
  - Spironolactone studied in Class III & IV patients
  - Eplerenone studied in post MI pts with HF
- Contraindications
  - hyperkalemia
  - renal failure, creatinine >2.5
- Use cautiously:
  - patients on potassium supplements
  - hyponatremia
  - renal insufficiency
  - hepatic disease

Aldosterone Antagonists

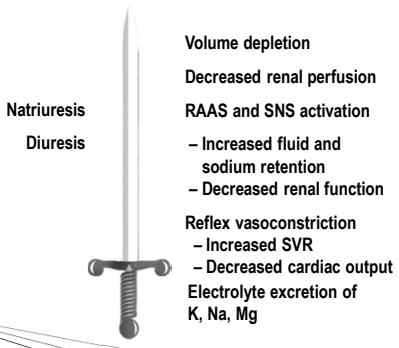
- Patient education:
  - May need to teach patient to eat foods low in potassium
  - discontinue potassium-based salt substitutes
  - Check K+ levels one & three weeks after initiation, after dose changes, and regularly thereafter

Diuretics

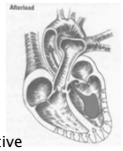
- Used to relieve fluid retention in symptomatic patients; use as little dose as possible
  - Improves exercise tolerance
- Facilitate the use of other drugs indicated for heart failure
- Patients can be taught to adjust their diuretic dose based on changes in body weight

Diuretics

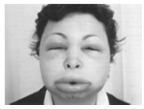
- Electrolyte depletion a frequent complication
- Should never be used alone to treat heart failure
- Higher doses of diuretics are associated with increased mortality



Reduce Afterload

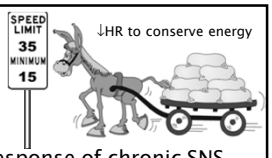


- Arterial Vasodilators
  - ACE (Angiotension-converting enzyme) Inhibitor
    - Blocks the RAAS effect of vasoconstriction
    - Enhances the action of kinins, which promotes a positive vasodilatory effect
    - Slows disease progression
  - Angiotension Receptor Blockers
    - Directly blocks angiotension II – results vasodilitory effect
    - Used if patient cannot tolerate ACEI due to cough or angioedema



  - Hydralazine and Nitrate Combination
    - Hydralazine – arterial vasodilator
      - Recommended in African Americans with systolic dysfunction
    - Oral nitrates are venous vasodilators (preload reduction)
- Milrinone (Primacor) Phosphodiesterase inhibitor
  - Causes vasodilation to ↓ preload and afterload

Beta Blockers



- Blocks the neurohormonal response of chronic SNS stimulation
- Slows heart rate for better diastolic ventricular filling
- Not initiated when fluid overload or in a decompensated state
- Initiate after fluid status optimized (no longer needing IV diuretics or IV vasodilators)
- Reduces arrhythmias
- Slows disease progression
- Carvedilol (Coreg), Metoprolol (Lopressor), and Bisoprolol (Zebeta)

How to Initiate Beta Blockers in Heart Failure

- Ensure patient is not fluid overloaded or dehydrated
- Start at the lowest dosage
- Increase to next dosage level every 2 weeks – as tolerated
- Encourage patient to continue, even if somewhat more fatigued

Managing Side Effects During β-Blocker Uptitration

- Vasodilator side effects
  - Reassure patient that side effect is usually temporary
  - Separate the dosing of β-blocker and ACE inhibitor
  - If persistent, reduce vasodilators/diuretics*†
  - If persistent, reduce β-blocker dosage*

*Usually temporary; †If appropriate

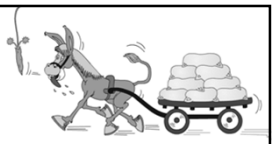
Managing Side Effects During β-Blocker Uptitration

- Fluid retention
  - Increase diuretic to restore weight to baseline level
  - If persistent, reduce β-blocker dosage*
  - Delay uptitration until weight is at baseline
- Bradycardia/AV block
  - Reduce dosage (or discontinue) drugs with effects on sinus and AV nodes†
  - Measure digoxin levels†. May reduce digoxin dose or discontinue
  - Reduce β-blocker dose

Beta Blockers "Olols"

•Acebutolol	Sectral
•Atenolol	Tenormin
•Betaxolol	Kerlone
•Bisoprolol	Zabeta
•Metoprolol	Lopressor
•Nadolol	Corgard
•Pindolol	Visken
•Propanolol	Inderal
•Timolol	Blocadren

Increase Contractility



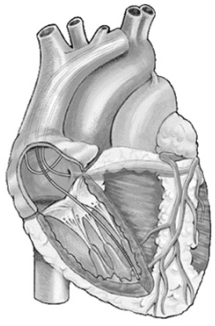
- Increase contractility by first ↓ afterload
- Digoxin
  - Oral medicine of choice to assist with contractility
  - Enhances inotropy of cardiac muscle
  - Reduces activation of SNS and RAAS
  - Most effective in patients with low EF
- Dobutamine
  - ↑ contractility by stimulating beta receptors
- Milrinone (Primacor) Phosphodiesterase inhibitor
  - Increases calcium ion uptake.
  - Has positive inotropic effect

Medications to Avoid in HF

- NSAIDS (non-sterodial anti-inflammatory drugs
  - ↑ risk of fluid retention and renal failure
  - May diminish the efficancy of diuretics and ACE inhibitors
- Most antiarrhythmics
  - Poorly tolerated due to proarrhythmic & cardiodepressant effects
  - Amiodarone – does not adversely effect HF survival
- Calcium channel blockers
  - Amlodipine is okay
- Avandia (Rosiglitasone Maleate)
  - Can cause fluid retention and exacerbate HF

CRT Systems

- Atrial lead in right atrial appendage (same as conventional pacing)
- Right-ventricular lead at the RV apex or RV outflow tract
- Left-ventricular lead is passed through the coronary sinus and into one of the vessels on the outside of the heart

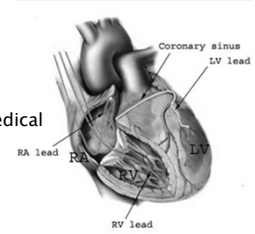


Cardiac Resynchronization Therapy

Patient Indications

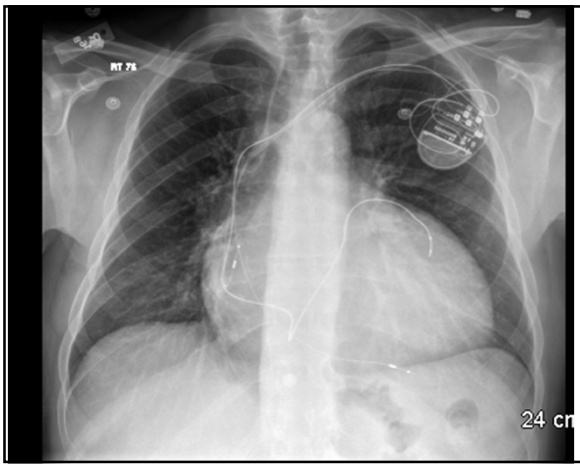
CRT device:

- Moderate to severe HF (NYHA Class III/IV) patients
- Symptomatic despite optimal, medical therapy
- QRS ≥ 130 msec
- LVEF ≤ 35%



CRT plus ICD:

- Same as above with ICD indication



Nonpharmacological Treatments of HF

- Diet
- Daily weights
- Exercise
- Teach back

Health care reform What does that mean to me as a Fairbanks Memorial Hospital Employee?

- **Part of Health Care Reform and the move from a hospital based approach to a continuum-of-care approach is the challenge for hospitals and key health care providers of the continuum to work together to manage complex patients' more efficiently and with an integrated approach than ever before.**

How do readmissions come into play?

- **Beginning in 2013 Medicare and Medicaid <u>will not</u> pay for patients who are discharge from the hospital with those four diagnosis and readmitted back to the hospital within 31 days.**
- **As you know, many of these types of patients have complex needs both medically and socially which can often put them back in the acute care hospital within 31 days of discharge.**
- **If a person is readmitted within 31 days then we get <u>zero</u> pay for the second stay**

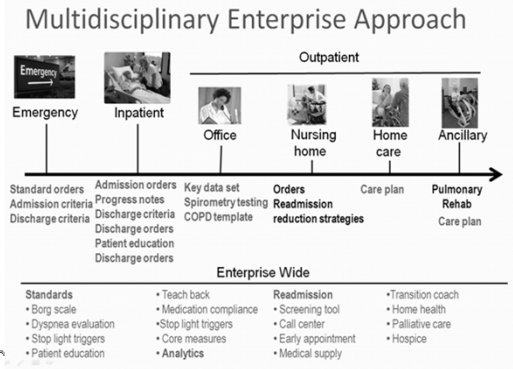
Readmissions

- ♥Heart Failure
- ♥COPD
- ♥Pneumonia
- ♥AMI

Methodist Approach is an Enterprise Approach

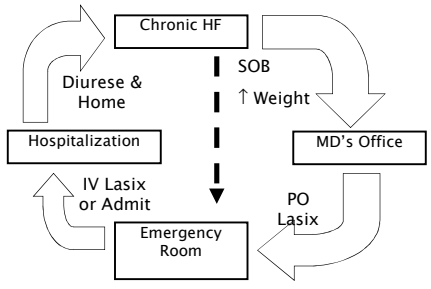
- **We need everyone who interacts with the patient as part of the healthcare team to all function from a common set of standardized tools and interventions – with the goal to assist in managing these patients more effectively to keep them out of the hospital with improved management on the outpatient side.**
- **…..Hence an enterprise wide approach**

Multidisciplinary Enterprise Approach

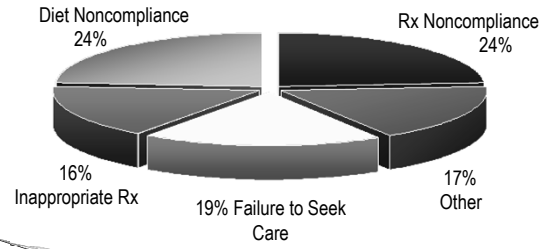


Heart Failure is the nation's most rapidly growing heart problem

The Vicious Cycle of Heart Failure Management



Causes of Hospital Readmission for Heart Failure



Vinson *J. Am Geriatr Soc.* 1990;38:1290-5.

Dietary Noncompliance Accounts for 24% of Readmission Rate

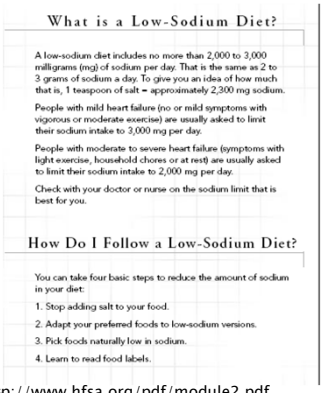
- Removing table salt does *not* constitute a low sodium diet
- Wean, rather than abruptly discontinue usual diet
- Teach how to read a food label
- Reframe: alternatives, replacements, not deprivation
  - How to eat out
  - Menus
- Utilize dietitian whenever possible
- Some patients also require fluid restriction

People who should limit their sodium to 1,500 mg a day are:

- People who are 51 years or older
- African Americans
- People with high blood pressure
- People with diabetes
- People with chronic kidney disease

1/4 teaspoon salt = 600 mg sodium
1/2 teaspoon salt = 1,200 mg sodium
3/4 teaspoon salt = 1,800 mg sodium
1 teaspoon salt = 2,300 mg sodium

http://www.cdc.gov/salt/food.htm



What is a Low-Sodium Diet?

A low-sodium diet includes no more than 2,000 to 3,000 milligrams (mg) of sodium per day. That is the same as 2 to 3 grams of sodium a day. To give you an idea of how much that is, 1 teaspoon of salt = approximately 2,300 mg sodium.

People with mild heart failure (no or mild symptoms with vigorous or moderate exercise) are usually asked to limit their sodium intake to 3,000 mg per day.

People with moderate to severe heart failure (symptoms with light exercise, household chores or at rest) are usually asked to limit their sodium intake to 2,000 mg per day.

Check with your doctor or nurse on the sodium limit that is best for you.

How Do I Follow a Low-Sodium Diet?

You can take four basic steps to reduce the amount of sodium in your diet:

1. Stop adding salt to your food.
2. Adapt your preferred foods to low-sodium versions.
3. Pick foods naturally low in sodium.
4. Learn to read food labels.

http://www.hfsa.org/pdf/module2.pdf

Reading a Food Label for Sodium Content

Nutrition Facts

Serving Size 5 oz
Servings Per Container 4

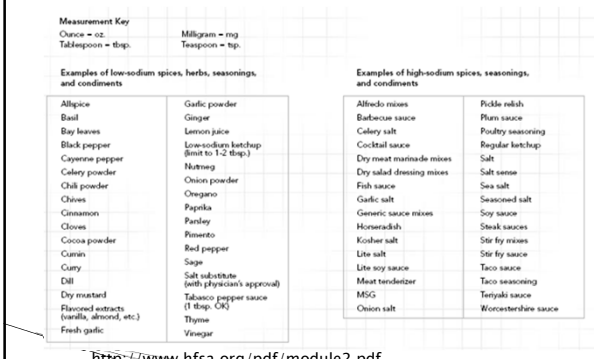
Amount Per Serving

Calories 90	Calories from Fat 30
	% Daily Value*
Total Fat 3g	5%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 440mg	19%
Total Carbohydrate 13g	4%
Dietary Fiber 3g	4%
Sugars 3g	
Protein 3g	
Vitamin A 80% •	Vitamin C 60%
Calcium 4% •	Iron 4%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or depending on your calorie needs:

More nutrients may be listed on some labels.

Removing table salt does *not* constitute a low sodium diet



Measurement Key

Ounce = oz. Milligram = mg
Tablespoon = tbsp. Teaspoon = tsp.

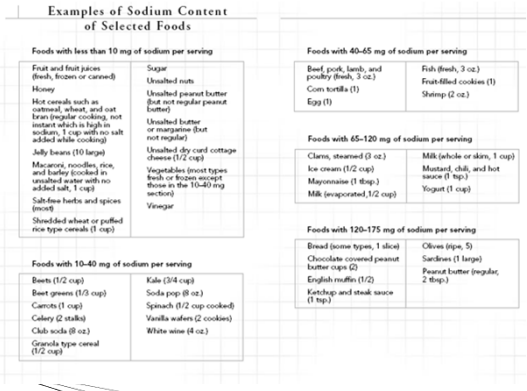
Examples of low-sodium spices, herbs, seasonings, and condiments

Allspice	Garlic powder
Basil	Ginger
Bay leaves	Lemon juice
Black pepper	Low-sodium ketchup (limit to 1-2 tbsp.)
Cayenne pepper	Nutmeg
Celery powder	Onion powder
Chili powder	Oregano
Chives	Paprika
Cinnamon	Parsley
Cloves	Pimento
Cocoa powder	Red pepper
Cumin	Sage
Curry	Salt substitute (with physician's approval)
Dill	Tabasco pepper sauce (1 tbsp. OK)
Dry mustard	Thyme
Flavored extracts (vanilla, almond, etc.)	Vinegar
Fresh garlic	

Examples of high-sodium spices, seasonings, and condiments

Alfredo mixes	Pickle relish
Barbecue sauce	Plum sauce
Celery salt	Poultry seasoning
Cocktail sauce	Regular ketchup
Dry meat marinade mixes	Salt
Dry salad dressing mixes	Salt sense
Fish sauce	Sea salt
Garlic salt	Seasoned salt
Generic sauce mixes	Soy sauce
Horseradish	Steak sauces
Kosher salt	Stir fry mixes
Lite salt	Stir fry sauce
Lite soy sauce	Taco sauce
Meat tenderizer	Taco seasoning
MSG	Teriyaki sauce
Onion salt	Worcestershire sauce

http://www.hfsa.org/pdf/module2.pdf



Examples of Sodium Content of Selected Foods

Foods with less than 10 mg of sodium per serving

Fruit and fruit juices (fresh, frozen or canned)	Sugar
Honey	Unsalted nuts
Hot cereals such as oatmeal, wheat, and oat bran (regular cooking, not instant which is high in sodium, 1 cup with no salt added while cooking)	Unsalted peanut butter (but not regular peanut butter)
Jelly beans (10 large)	Unsalted butter or margarine (but not regular)
Macaroni, noodles, rice, and barley (cooked in unsalted water with no added salt, 1 cup)	Unsalted dry curd cottage cheese (1/2 cup)
Salt-free herbs and spices (most)	Vegetables (most types fresh or frozen except those in the 10–40 mg section)
Shredded wheat or puffed rice type cereals (1 cup)	Vinegar

Foods with 10–40 mg of sodium per serving

Beets (1/2 cup)	Kale (3/4 cup)
Beet greens (1/3 cup)	Soda pop (8 oz.)
Carrots (1 cup)	Spinach (1/2 cup cooked)
Celery (2 stalks)	Vanilla wafers (2 cookies)
Club soda (8 oz.)	White wine (4 oz.)
Granola type cereal (1/2 cup)	

Foods with 40–65 mg of sodium per serving

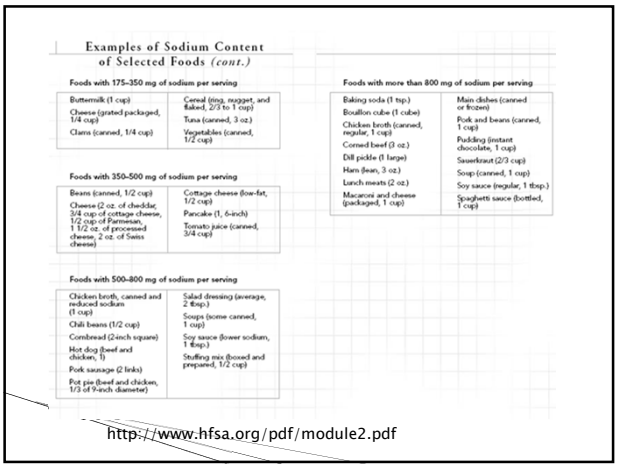
Beef, pork, lamb, and poultry (fresh, 3 oz.)	Fish (fresh, 3 oz.)
Corn tortilla (1)	Fruit-filled cookies (1)
Egg (1)	Shrimp (2 oz.)

Foods with 65–120 mg of sodium per serving

Clams, steamed (3 oz.)	Milk (whole or skim, 1 cup)
Ice cream (1/2 cup)	Mustard, chili, and hot sauce (1 tsp.)
Mayonnaise (1 tbsp.)	Yogurt (1 cup)
Milk (evaporated,1/2 cup)	

Foods with 120–175 mg of sodium per serving

Bread (some types, 1 slice)	Olives (ripe, 5)
Chocolate covered peanut butter cups (2)	Sardines (1 large)
English muffin (1/2)	Peanut butter (regular, 2 tbsp.)
Ketchup and steak sauce (1 tsp.)	



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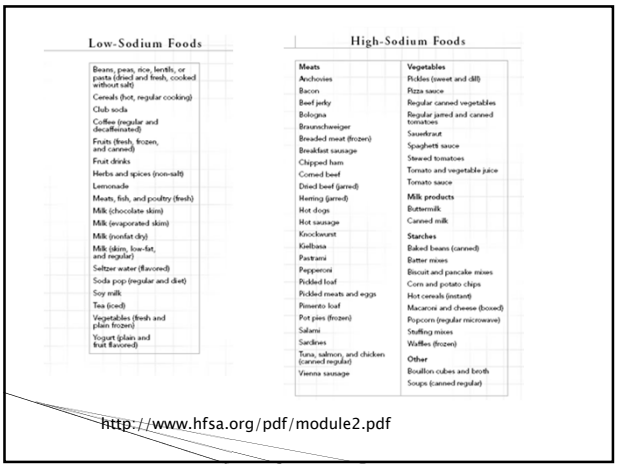

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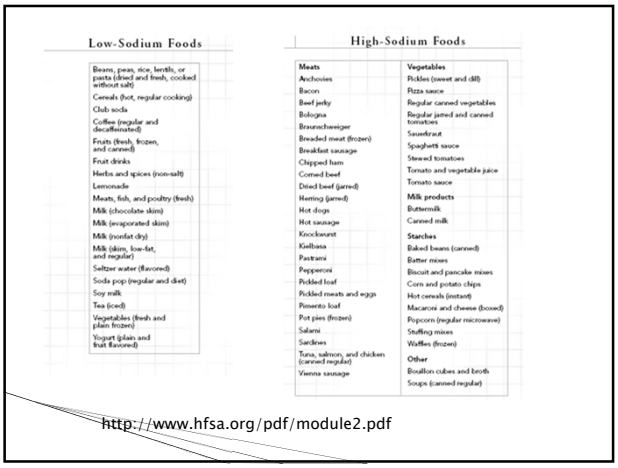
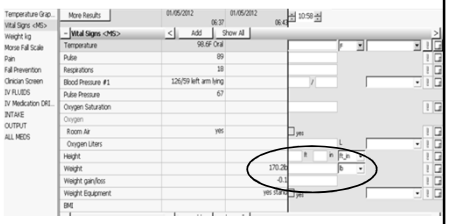


http://www.hfsa.org/pdf/module2.pdf

- **Daily weight documentation following weight standards: Weigh on admission to unit, including transfers, then:**
  - **Weigh between 4 – 6 am**
  - **Same scale**
  - **Empty bladder**
  - **Do not weigh monitor**
  - **Stand to weigh if able**
  - **Document in computer which type of scale used**
  - **Document the weight difference from previous day's wt (+ or –) in the computer**

Wt Gain/Loss – should be charted daily

Weights
- 126 lb
- 127
- 124.9
- 112.7
- 120.9
- 120.3



Quiz Time

How many ml = 2.2 pounds or 1 kg?

A. 220 ml
B. 500 ml
C. 1000 ml
D. 2200 ml

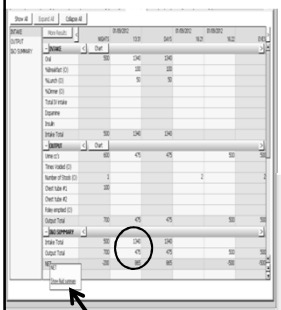
You are the nurse taking care of this patient on 5/9. What are your concerns?

	05/05/07 00:00	05/06/07 00:00	05/07/07 00:00	05/08/07 00:00	05/09/07 00:00	05/10/07 00:00
Vital Signs						
BP #1	148/58 Rarmly*	120/75 Larmly*	159/77 Rarmly*	&*	&*	
O2 Sat	94*		92*	100*	86*	&*
Oxygen L			2L Nc&	5L Nc&*		
Oxygen %					60% Vent	80% Vent*
Bld Gluc 65-100	202*	221*	224*	212*	88*	249*
Weight	190.7lb	194.2lb	196.5lb	199.3lb	199.1lb	
Weight Equip		Yes Sling				
Weight (kg)						93.6kg
non-inv bp	154/58*			&*	&*	
art line bp					105/59*	132/57*
Art line MAP					72*	71*
MAP	88*			103*	81*	
I&O						
Intake Total	3928*	5298*	2675*	3493*	3696*	2233*
Output Total	2546*	4010*	1050*	1987.5*	455*	411*
NET	1382*	1288*	1625*	1505.5*	3241*	1822*

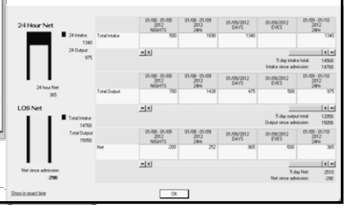
Example of good diuresis

	12/06/09 00:00	12/07/09 00:00	12/08/09 00:00	12/09/09 00:00	12/10/09 00:00	12/11/09 00:00
Vital Signs						
Temperature	99.7F Core*	100F Core*	100.2F Core*	99.5F*	99.9F Core*	100F Core*
Temperature	98.6F Core	99.7F Core*	99.7F Core*			
Pulse	142*	105*	112*	106*	112*	92*
Respirations	16*	13*	13*	13*	15*	22*
BP #1						
O2 Sat	100*	100*	98*	97*	96*	99*
Room air						
Oxygen L	6L*					
Oxygen %	80% Vent*	50% Vent*	30% Vent*	30% Vent*	30% Vent*	30% Vent*
Bld Gluc 65-100	231mg/dl*		206mg/dl*	233mg/dl*	234mg/dl&*	278mg/dl*
Weight						142.9lb
Weight Equip						
Height						
Weight (kg)	79.9kg	76kg	71.1kg	68.9kg	67.7kg	
Resp Effort			Reg			
non-inv bp						
art line bp	122/68*	111/51*	122/53*	108/45*	109/42*	119/50*
Art line MAP	95*	66*	71*	62*	63*	70*
MAP						
art line bp 2	101/48*					
Art line MAP 2	75*					
I&O						
Intake Total	3182*	3826*	2841*	2430.57*	2548*	3045*
Output Total	5708*	6840*	6025*	4210*	4450*	4255*
NET	-2526*	-3014*	-3184*	-1779.43*	-1902*	-1210*

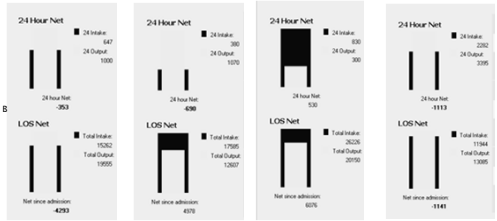
How to check 24 hour & LOS Net



Show fluid summary



Which of the following I & O would you be most concerned about?



A B C D

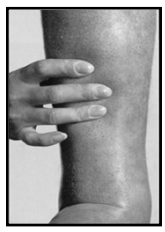
Educating Patients About Daily Weights

- The vascular bed can hold 10 pounds of fluid before it starts to seep out into the tissues
  - 2 pounds = 1 quart of water extra in the circulation

- Keep track – standard is to notify MD of a 2-3 pound weight gain overnight or 5 pound gain in one week

Assessment of Fluid Volume Status

- Teaching points for patients/families:
  - Ankle swelling (shoes too tight, socks make marks on leg)
  - Abdominal swelling ("bloated", belt too tight)
  - Orthopnea
  - Paroxysmal nocturnal dyspnea
  - Weight gain
  - Shortness of Breathe with walking



Exercise Recommendations

- Start slow, increase slowly
- Avoid the extremes of intemperate climates
  - mall walking
  - indoor treadmills or tracks
  - exercise cycle indoors
- May not initially tolerate exercise
  - may see increased symptoms (2-6 weeks)
    - increased blood volume
  - fatigue
- Don't be discouraged by inevitable interruptions in activity/training schedule

Patient Teaching - Exercise

Exercise such as walking is important but don't overdo it. Set realistic goals and don't "push". Stop exercising immediately if you feel tired, have chest pain, or are very short of breath. Using your activity in the hospital as a guide start with that amount of exercise and gradually increase.

➢ Remember these tips as well:

- Do things at a slow to moderate pace – don't rush.
- Space out activities throughout the day taking 20-30 minute rest periods. Do "easy" activities alternating with harder ones.
- Don't exercise for at least one hour after meals.
- Avoid extremely hot or cold temperatures.
- Avoid heavy exercise and weight lifting. Ask the doctor about returning to work and doing active recreational activities.
- Keep the general guidelines above and use positions easy for you when you feel able to resume your sexual activity.

HF HEART FAILURE FACT SHEET

American Heart Association | American Stroke Association. GET WITH THE GUIDELINES HEART FAILURE

HEART FAILURE HF

Get With The Guidelines®-Heart Failure is the American Heart Association's collaborative quality improvement program, demonstrated to improve adherence to evidence-based care of patients hospitalized with heart failure.

The program provides hospitals with a web-based Patient Management Tool™ (powered by Outcome Sciences, Inc.), decision support, robust registry, real-time benchmarking capabilities and other performance improvement methodologies toward the goal of enhancing patient outcomes and saving lives.

Get With The Guidelines-HF is for patients in ICD-9 codes HF: (402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20,428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9).

HF ACHIEVEMENT MEASURES

- **ACEI/ARB at discharge:** Percent of heart failure patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular function (LVF) consistent with moderate or severe systolic dysfunction.*
  TARGET: HEART FAILURE MEASURE
- **Evidence-based specific beta blockers:** Percent of heart failure patients who were prescribed with evidence-based specific beta blockers (Bisoprolol, Carvedilol, Metoprolol Succinate CR/XL) at discharge.
  TARGET: HEART FAILURE MEASURE
- **Measure LV function:** Percent of heart failure patients with documentation in the hospital record that left ventricular function (LVF) was assessed before arrival, during hospitalization, or is planned for after discharge.*
- **Post-discharge appointment for heart failure patients:** Percent of eligible heart failure patients for whom a follow-up appointment was scheduled and documented including location, date, and time for follow up visits or location and date for home health visit.

*Denotes TJC HF Core measures.

Get with the Guidelines HF Silver and Gold Plus

- In addition to Achievement Award
- Select 4 or more of the HF Quality Measures
- Demonstrate at least and average of 75% or above compliance

Get with the Guidelines HF Silver and Gold Plus

HF QUALITY MEASURES

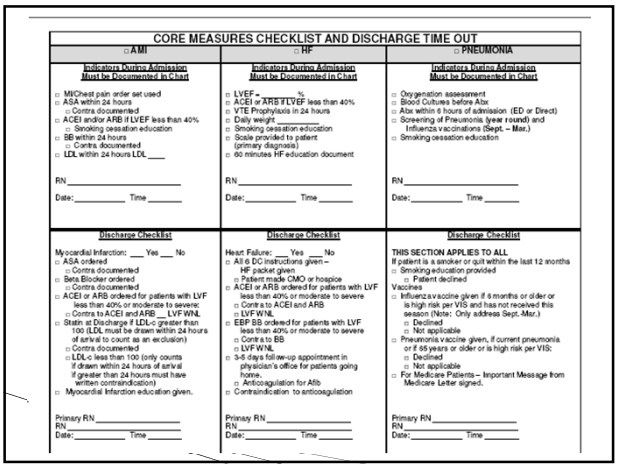
- **Aldosterone antagonist at discharge:** Percent of heart failure patients with left ventricular systolic dysfunction (LVSD) with no contraindications or documented intolerance who were prescribed aldosterone antagonist at discharge.
  TARGET: HEART FAILURE MEASURE
- **Influenza vaccination during flu season:** Percent of patients that received an influenza vaccination prior to discharge during flu season.
- **Pneumococcal vaccination:** Percent of patients that received a pneumococcal vaccination prior to discharge.
- **Follow-up visit within 7 days or less:** Percent of eligible heart failure patients who underwent a follow-up visit within 7 days or less from time of hospital discharge.
  TARGET: HEART FAILURE MEASURE

*Denotes TJC HF Core measures.

- **Anticoagulation for atrial fibrillation:** Percent of patients with chronic or recurrent atrial fibrillation prescribed anticoagulation therapy at discharge.
- **Hydralazine nitrate at discharge:** Percent of black heart failure patients with left ventricular systolic dysfunction (LVSD) with no contraindications or documented intolerance who were prescribed a combination of hydralazine and isosorbide dinitrate at discharge. Note: This treatment is recommended in addition to ACEI or ARB and beta blocker therapy at discharge.
- **DVT prophylaxis:** Percent of patients with heart failure and who are non-ambulatory who receive DVT prophylaxis by end of hospital day two.
- **CRT-D or CRT-P placed or prescribed at discharge:** Percent of heart failure patients with left ventricular ejection fraction less than or equal to 35% with a QRS duration of 120 ms or above with no contraindications, documented intolerance, or any other reason against who have CRT-D or CRT-P, had CRT-D or CRT-P placed, or were prescribed CRT-D or CRT-P at discharge.
- **ICD counseling, or ICD placed or prescribed at discharge:** Percent of heart failure patients with left ventricular ejection fraction less than or equal to 35% with no contraindications, documented intolerance, or any other reason against who had ICD counseling provided, who have ICD prior to hospitalization, had an ICD placed, or were prescribed an ICD at discharge.

*Denotes TJC HF Core measures.

OCTOBER 20



CORE MEASURES CHECKLIST AND DISCHARGE TIME OUT

□ AMI	□ HF	□ PNEUMONIA
Indicators During Admission Must be Documented in Chart	**Indicators During Admission Must be Documented in Chart**	**Indicators During Admission Must be Documented in Chart**
□ MI/Chest pain order set used □ ASA within 24 hours □ Contra documented □ ACEI and/or ARB if LVEF less than 40% □ Smoking cessation education □ BB within 24 hours □ Contra documented □ LDL within 24 hours LDL ___ RN _____ Date: _____ Time _____	□ LVEF = _____ % □ ACEI or ARB if LVEF less than 40% □ VTE Prophylaxis in 24 hours □ Daily weight _____ □ Smoking cessation education □ Scale provided to patient (primary diagnosis) □ 60 minutes HF education document RN _____ Date: _____ Time _____	□ Oxygenation assessment □ Blood Cultures before Abx □ Abx within 6 hours of admission (ED or Direct) □ Screening of Pneumonia (year round) and Influenza vaccinations (Sept. – Mar.) □ Smoking cessation education RN _____ Date: _____ Time _____
Discharge Checklist	**Discharge Checklist**	**Discharge Checklist**
Myocardial Infarction: ___ Yes ___ No □ ASA ordered □ Contra documented □ Beta Blocker ordered □ Contra documented □ ACEI or ARB ordered for patients with LVF less than 40% or moderate to severe □ Contra to ACEI and ARB __ LVF WNL □ Statin at Discharge if LDL-c greater than 100 (LDL must be drawn within 24 hours of arrival to count as an exclusion) □ Contra documented □ LDL-c less than 100 (only counts if drawn within 24 hours of arrival If greater than 24 hours must have written contraindication) □ Myocardial Infarction education given. Primary RN _____ RN _____ Date: _____ Time _____	Heart Failure: ___ Yes ___ No □ All 6 DC instructions given – HF packet given □ Patient made CMO or hospice □ ACEI or ARB ordered for patients with LVF less than 40% or moderate to severe □ Contra to ACEI and ARB □ LVF WNL □ EBP BB ordered for patients with LVF less than 40% or moderate to severe □ Contra to BB □ LVF WNL □ 3-5 days follow-up appointment in physician's office for patients going home. □ Anticoagulation for Afib □ Contraindication to anticoagulation Primary RN _____ RN _____ Date: _____ Time _____	**THIS SECTION APPLIES TO ALL** If patient is a smoker or quit within the last 12 months □ Smoking education provided □ Patient declined Vaccines □ Influenza vaccine given if 6 months or older or is high risk per VIS and has not received this season (Note: Only address Sept.-Mar.) □ Declined □ Not applicable □ Pneumonia vaccine given, if current pneumonia or if 65 years or older or is high risk per VIS: □ Declined □ Not applicable □ For Medicare Patients – Important Message from Medicare Letter signed. Primary RN _____ RN _____ Date: _____ Time _____

Patient Education

- Studies have shown that 40-80 percent of the medical information patients receive is forgotten immediately [1]
- Nearly half of the medical information retained is incorrect. [2]

1. Kessels RP. Patients' memory for medical information. J R Soc Med. May 2003;96(5):219-22.
2. Anderson JL, Dodman S, Kopelman M, Fleming A. Patient information recall in a rheumatology clinic. Rheumatology. 1979;18(1):18-22

- To learn you need to hear something
  - **6 times**
  - **6 different ways**

6 **SIX** **VI** seis ШГ I six

Patient Education – Teach Back

- One of the easiest ways to close the gap of communication between clinician and patient is to employ the "teach-back" method, also known as the "show-me" method or "closing the loop."[3]
- Teach-back is a way to confirm that you have explained to the patient what they need to know in a manner that the patient understands. Patient understanding is confirmed when they explain it back to you. It can also help the clinic staff members identify explanations and communication strategies that are most commonly understood by patients.

1. Schillinger D, Piette J, Grumbach K, et al. Closing the loop: physician communication with diabetic patients who have low health literacy. Arch Intern Med. 2003;163(1):83-90.
2. http://www.nchealthliteracy.org/toolkit/tool5.pdf

What is Teach-back?

- A way to make sure you—the health care provider—explained information clearly. It is not a test or quiz of patients.
- Asking a patient (or family member) to explain **in their own words** what they need to know or do, in a caring way.
- A way to check for understanding and, if needed, re-explain and check again.
- A research-based health literacy intervention that improves patient-provider communication and patient health outcomes[1].

[1] Schillinger, 2003

Teach-back:
A Health Literacy Tool to Ensure Patient Understanding

Presentation created by The Iowa Health System Health Literacy Collaborative

The Challenge

- Research shows that patients remember and understand less than half of what clinicians explain to them.

Ley, Communicating with patients: improving communication satisfaction, and compliance 1988

Rost, Predictors of recall of medication regimens and recommendations for lifestyle change in elderly patients 1987.

Universal Communication Principles

- **Everyone** benefits from clear information.
- Many patients are at risk of misunderstanding, but it is hard to identify them.
- Testing general reading levels does not ensure patient understanding in the clinical setting.

Adapted from: *Reducing the Risk by Designing a Safer, Shame-Free Health Care Environment*. AMA, 2007

Talking with Patients & Families

Always:

- Use Plain Language.
- Slow down.
- Break it down into short statements.
- Focus on the 2 or 3 most important concepts.
- Check for understanding using **teach-back**.

Teach-back

- Why do I use it?
- What is it?
- How do I use it?
- When do I use it?

Teach-back is…

- Asking patients to repeat **in their own words** what they need to know or do, in a non-shaming way.
- **NOT** a test of the patient, but of how well ***you*** explained a concept.
- A chance to check for understanding and, if necessary, re-teach the information.

Teach-back is Supported by Research

- "Asking that patients recall and restate what they have been told" is one of 11 top patient safety practices based on the strength of scientific evidence."
  AHRQ, 2001 Report, *Making Health Care Safer*
- "Physicians' application of interactive communication to assess recall or comprehension was associated with better glycemic control for diabetic patients."
  Schillinger, Arch Intern Med/Vol 163, Jan 13, 2003, "Closing the Loop"

Asking for a Teach-back - Examples

Ask patients to demonstrate understanding, *using their own words*:

- "I want to be sure I explained everything clearly. Can you please explain it back to me so I can be sure I did?"
- "What will you tell your husband about the changes we made to your blood pressure medicines today?"
- "We've gone over a lot of information, a lot of things you can do to get more exercise in your day. In your own words, please review what we talked about. How will you make it work at home?"

Teach-back…

- Creates an opportunity for dialogue in which the provider gives information, then asks the patient to respond and confirm understanding *before* adding any new information.
  - Re-phrase if a patient is not able to repeat the information accurately.
  - Ask the patient to teach back the information again, *using their own words*, until you are comfortable they really understand it.
  - If they still do not understand, consider other strategies.

Teach-back – Additional Points

- Do <u>not</u> ask yes/no questions like:
  - "Do you understand?"
  - "Do you have any questions?"
- For more than one concept:
  - "Chunk and Check"
    - Teach the 2-3 main points for the first concept & check for understanding using teach-back…
    - Then go to the next concept

Teach-back – Using it Well: Elements of Competence

- Responsibility is on the provider.
- Use a caring tone of voice & attitude.
- Use Plain Language.
- Ask patient to explain using their own words (***not*** yes/no).
- Use for all important patient education, specific to the condition.
- Document use of & response to teach-back.

Acknowledgements

- Iowa Health System
  - Health Literacy Teams
  - Mary Ann Abrams, MD, MPH
  - Bob Dickerson, MSHSA, RRT
  - Barb Earles, RN, MHA, CPHRM
  - Gail A. Nielsen, BSHCA, IHI Fellow
  - Barb Savage, MT (ASCP)
- American Medical Association
- American Medical Association Foundation
- New Readers of Iowa
- Audrey Riffenburgh, MA, Riffenburgh & Associates
- Ashley Hink, MPH

10 Elements of Competence for Using Teach-back Effectively

1. Use a caring tone of voice and attitude.
2. Display comfortable body language and make eye contact.
3. Use plain language.
4. Ask the patient to explain back, using their own words.
5. Use non-shaming, open-ended questions.
6. Avoid asking questions that can be answered with a simple yes or no.
7. Emphasize that the responsibility to explain clearly is on you, the provider.
8. If the patient is not able to teach back correctly, explain again and re-check.
9. Use reader-friendly print materials to support learning.
10. Document use of and patient response to teach-back.

Heart Failure Teach Back Questions Day 1	**Teach Back Questions Day 2**
Patient Interview: 1. What do you think triggered your admission to the hospital? 2. What are the symptoms of your heart failure? 3. What is the name of your water pill? 4. What weight gain should you call your doctor about? Do you have a scale at home? 5. What foods should you avoid when you have heart failure? Interventions: • Give scale / weight documented on card. • Give and document heart failure packet. • Heart failure beginning treatment video. • Document triggers in the notes section of Day 1 questions • Document all education in computer Repeat Day 1 Questions until patient understands. For newly diagnosed HF , change questions to "This is your water pill." "Call about weight gain..." etc	Continue with Day 2 after patient understands Day 1 questions. Patient Interview: 1. Why is it important to take your medication for heart failure? 2. Why is it important to avoid foods with sodium (salt)? 3. Why is it important to watch for the symptoms of heart failure? 4. Why is it important to watch for weight gain? Interventions: • Dietician follow –up. o Low sodium o Reading a label o Dining out and ordering from a menu • Medication video. • Nutrition video. • Document all education in computer

Find out what triggered this hospitalization

- Change in Diet
- Eating salty foods
- Skipped medications
- Any new medications
- Traveled anywhere in the last two days
- Change in activity
- Taking an NSAIDs or Cox II

NSAIDS increase sodium & fluid retention; cause peripheral vasoconstriction, enhance toxicity of ACEI & diurectics

Teach Back Questions Day 3	**Teach Back Questions Discharge**
Continue with Day 3 after patient understands Day 1 & 2 questions. Patient Interview: 1. How will you remember to take your water pill every day? 2. How do you plan to change to a low-sodium (salt) diet? 3. How will you check for heart failure symptoms every day? 4. How will you weight yourself every day? 5. How will you plan your activities for the day? Interventions • Exercise video. • Smoking Cessation video if smoker. • Document all education in computer	Patient Discharge Interview: 1. Tell me some reasons to call the doctor. 2. Tell me about your medication and when you will take them. 3. How will you keep yourself from being readmitted? Interventions: • Discharge video • Give HF support group handout and encourage attendance. • Review meds • Review HF weight card/target weight – when to call MD • Follow-up appointment made within one week or home health referral. • Verify all Core measures documented including HF packet given.