

# HEART FAILURE

Caring for the Patient



# Objectives

- Describe the normal anatomy of the heart and the physiology of normal heart function.
- Understand the pathophysiology of heart failure and the causes and symptoms.
- Explain the diagnosis and treatment options for individuals with congestive heart failure.
- Identify the importance of patient education in a heart failure patient.

# Function of the Heart

The heart beats approximately 100,000 times a day every day of our lives. That means it beats (and pumps) each of the 365 days per year. With an average life span in the United States of over 70 years, that is an incredible total amount of activity! When all is working well, you don't even have to think about your heart. You don't have to **tell it to beat** or explain how fast or how slow to do so.



# Cardiac Anatomy and Physiology

When you have a sudden need for increased oxygenation such as during exercise, or perhaps stress; the heart pumps at a faster rate.

When you are at rest, it will return to your normal resting rate.

The human body and its compensatory mechanisms constantly adjust to maintain *homeostasis*. Homeostasis is our body's attempt to maintain a state of equilibrium or constancy in our internal environment.



# Heart Failure



- According to the American Heart Association, about 5.7 million Americans are living with heart failure today.
- In 2009, there were more than 3 million physician office visits for HF and 668,000 visits to the emergency department (ED). HF is responsible for more than 1 million hospital admissions.
- It is a serious illness that can affect how long a person lives. You may have heard that some people may die sooner because of heart failure. But with proper medications, the correct dosages, and careful management, a HF patient may live longer and feel better.

# What is Heart Failure?

Heart failure is a condition that develops when the heart's muscle becomes weakened, thickened or stiff. These conditions cause the heart to lose its ability to pump enough blood to supply the body's needs.

- It is chronic.
- It can be treated and managed but not cured.
- **YOU CAN LIVE WITH HEART FAILURE.**



# How does Heart Failure Affect the Body?

- Blood Circulation is poor due to the weakened heart muscle.
- **Congestion** or fluid can build up in the lung, abdomen, or legs.
- Is characterized by the myocardium's inability to pump enough blood to meet the body's metabolic demands.



# Risk factors for Heart Failure

- Uncontrolled High Blood Pressure
- Cardiomyopathy
- History of AMI
- Obesity
- Smoker
- High Cholesterol
- Damage to heart valves
- Diabetes
- Advanced Age

# Classes of Heart Failure

Doctors usually classify patients' heart failure according to the severity of their symptoms. The table below describes the most commonly used classification system, the New York Heart Association (NYHA) Functional Classification. It places patients in one of four categories based on how much they are limited during physical activity.

Class	Functional Capacity: How a patient with cardiac disease feels during physical activity
I	Patients with cardiac disease but resulting in no limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.
II	Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain.
III	Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea or anginal pain.
IV	Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort increases.

# Systolic Dysfunction

- **Systolic Dysfunction** develops because the heart cannot contract normally. The ventricle contracts poorly and does not empty fully. This results in increased diastolic volume and pressure and eventually the ejection fraction falls. Systolic dysfunction is common in heart failure that results from a myocardial infarction (heart attack). It affects primarily the left or right ventricle. Left ventricular failure (LV) will often lead to right ventricular (RV) failure as well.
- **Right Ventricular Failure** results in increased fluid retention in the tissues, particularly those dependent tissues (such as feet and ankles), as well as in abdominal area. This is the peripheral edema that you see in heart failure.

# Diastolic Dysfunction

- ***Diastolic Dysfunction*** develops because the heart's wall becomes stiff and may thicken, which interferes with the ability of the heart to fill with blood. Ventricular filling is impaired. The contractility and ejection fraction are good, but the reduced filling in the left ventricle can produce a lower cardiac output and systemic symptoms.
- Elevated pressures in the left atrium can produce pulmonary congestion, which is seen in the form of pulmonary edema and increased respiratory distress symptoms. Pulmonary edema results from left ventricular failure.

# Causes and Symptoms of Heart Failure

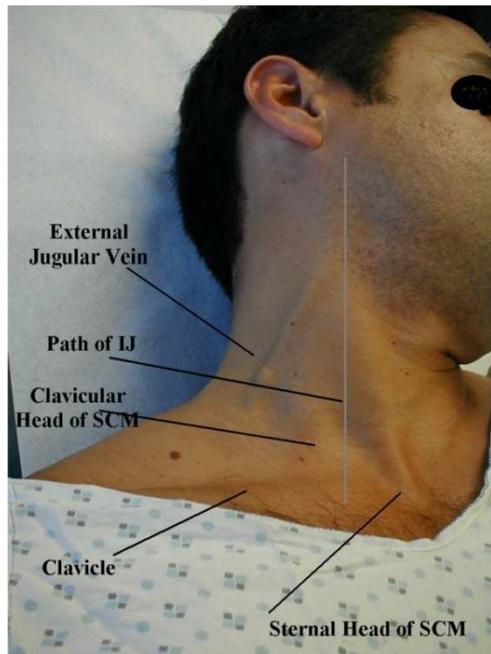
- Symptoms of heart failure may begin suddenly (acute failure) especially if the cause is due to a heart attack. In many people, symptoms develop gradually, and may develop over days to months. The disorder may stabilize for periods of time but can often progress slowly and insidiously (chronic failure).
- Right and Left sided heart failure produce different symptoms, but sometimes both sides may be involved. When this occurs you may see some symptoms from both, although one side will usually predominate.

# Symptoms of Right Sided HF

The symptoms of right sided HF include:

- Shortness of breath - dyspnea on exertion (DOE)
- Swelling of feet and ankles
- Urinating more frequently during nighttime
- Pronounced neck veins - neck vein distention
- Palpitations - the sensation of **feeling** the heartbeat
- Irregular and rapid heartbeat
- Fatigue and lethargy
- Weakness
- Fainting

# Jugular Vein Distention



- Jugular Vein Distention or JVD, is a sign of Heart Failure.
- Assessing JVD can be done by assessing the internal jugular pulsations that exceed 2 finger lengths above the clavicle, with the head of the bed at 30 degrees.

# Symptoms of Left Sided HF

- Shortness of breath - dyspnea on exertion (DOE).
- Difficulty with breathing when lying down.
- Palpitations - the sensation of “feeling” the heartbeat.
- Irregular or rapid pulse.
- Cough (Often the cough produces a “frothy” or blood tinged mucus).
- Fatigue and weakness (can also result in fainting).
- Weight gain (resulting from the fluid retention).
- Oliguria (scanty or decreased urine production).

# FACES of Heart Failure

## Signs and Symptoms



Fatigue (Tired)



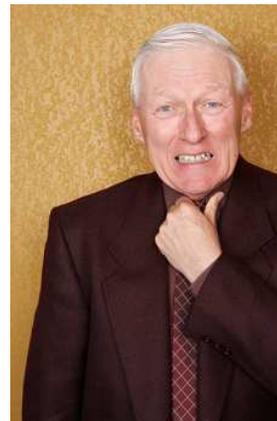
Edema  
(Swelling)



Activities  
Limited



Cough  
(Congestion)



Shortness  
of Breath

# What Kinds of Tests Could Be Ordered for a Heart Failure Patient?

**Chemistry (proBNP, BUN, creatinine) Echocardiogram, Stress Test**

The gold standard for assessing ejection fraction in the heart failure patient is an Echocardiogram

- Ejection Fraction is the percent of the total ventricular volume pumped with each contraction; more than 55% is normal; less than 40% is a characteristic of HF; less than 25% indicates that a patient may be a candidate for heart transplant
- In diastolic heart failure the EF can be around 50%
- In systolic heart failure it is usually  $< 40\%$

# Indications for Heart Failure

- In the chart, you would expect to find a diagnosis of heart failure on a consult form, a physician order sheet, and/ or progress notes.
- Examples of heart failure diagnosis progress notes are:
  - BNP of greater than 500.
  - Chest X-ray stating congestive heart failure.
  - Clinically short of breath at rest or a questionable Echocardiogram with an EF of less than 40%.
- Some of the first signs and symptoms of heart failure is if a patient had a weight gain of more than 3lbs in one day or 5lbs in one week.



# Why Are Daily Weights So Important?

- One of the first signs of heart failure is weight gain. It can be sudden or slow and progressive. The weight gain is due to an accumulation of fluid in the abdomen, feet, ankles and legs.
- Fluid can also back up in the lungs which is why patients get shortness of breath.
- Monitoring daily weights is important because increased weight gain in a heart failure patient is cause for concern.
- Teaching the patient to weigh themselves every morning after emptying their bladder and to call the physician if they gain more than 3lbs in a day is essential.



# Fluid Restriction and Diet in the Hospital

- If patient is NPO (Nothing by Mouth), do not give patient water or ice.
- Sometimes these patients, even if not NPO; can not have water pitchers or ice in their rooms.
- No added salt or extra fluid should be given to these patients.
- Sodium intake in the heart failure patient is usually limited to 2 grams daily unless otherwise indicated.
- Fluid intake is limited to 2000 ml or less.
- Diet and Fluid intake should be recorded daily.



# Activity

- Should progress as tolerated without shortness of breath.
- Activity should be followed according to the physician's orders.



# Medication Therapy



- **ACE Inhibitors** - can slow the progression of the disease by dilating or widening blood vessels, decreasing how hard the heart has to work. May cause excessive coughing. Must monitor potassium closely.
- **Angiotensin II Receptor Blockers** - causes muscles surrounding blood vessels to contract, thereby narrowing blood vessels.
- **Beta Blockers** - can slow the progression of the disease by blocking the release of harmful substances that can damage the heart. These drugs promote “remodeling” of the heart to return to its normal shape.
- **Digoxin** - helps strengthen the heart muscle. It is used for specific patients.
- **Diuretics** - Helps control symptoms by decreasing the fluid retention and swelling. Best for use in patients with edema.
- **Aldosterone Antagonists** - are also weak water pills. These medications are used to keep the heart from getting weaker.

# Ace Inhibitors



- ACE inhibitors used in heart failure reduce the blood levels of angiotensin II and aldosterone. In doing this, they cause the arteries and veins to dilate and help the kidneys to excrete excess water.
- There are some side effects to watch for. ACE inhibitors can cause moderate reversible renal insufficiency so monitoring of creatinine levels is helpful, and slower increases in dosage or reduction in diuretic dosage may be needed. Potassium retention may occur, especially if the patient is on potassium supplement. Cough occurs in some patients, occasional rash, azotemia, hypotension, and alopecia also are effects that might be seen. Drugs such as captopril, benazepril, and lisinopril are examples of ACE inhibitors.

# Angiotensin II Receptor Blockers (ARBs)

These drugs have effects that are similar to ACE inhibitors but are less likely to cause cough and angioedema. They too can cause a reversible renal dysfunction. Candesartan, Losartan, Valsartan, and Eprosartan are examples of this classification.



# Beta Blockers

- These drugs are especially useful in diastolic dysfunction because they reduce the heart rate, prolong the diastolic filling time, and may improve ventricular relaxation. Two beta-blockers that are specifically approved for heart failure include Carvedilol and long acting Metoprolol. Beta-blockers inhibit the activation of the sympathetic nervous system, blocking excessive stimulation of the heart.
- It should be noted that because these drugs slow the heart rate and reduce the force of the cardiac contractions, they might initially seem to worsen the symptoms. However they will produce long-term improvement in heart function and survival through blocking the norepinephrine action.



# Digoxin

- Digoxin is a commonly prescribed form of digitalis. It is one of the oldest medications used in the treatment for heart failure.
- It increases the force of the contraction and slows a heart rate that is too fast. It is sometimes used with diuretics and an ACE inhibitor to control symptoms.



# Diuretics

- Diuretics are frequently prescribed for patients with symptoms of systolic dysfunction. The dosage is usually adjusted to the lowest dose that will stabilize the patient's weight and relieve the symptoms. Diuretics help the kidneys to eliminate salt and water by increasing the formation of urine and thus decreasing the fluid volume throughout the body.
- Commonly used drugs include furosemide (Lasix) and bumetanide (Bumex). When given orally or through IV, they can produce results within hours or days, improve the cardiac function, and enhance the patient's physical activity tolerance.



# Nitrates/Vasodilators

- Nitrates alone can sometimes relieve heart failure symptoms. Nitrates are helpful in patients who have heart failure as well as angina.
- Vasodilators are not used as often as ACE inhibitors, which are more effective. But they may be used in people who don't respond to ACE inhibitors or cannot take them. Vasodilators such as Hydralazine or Isosorbide Dinitrate are included in this classification.

# Potassium Replacement

Because diuretics causes potassium loss in the urine, there may be a potassium supplement prescribed as well. In severe heart failure a drug such as spironolactone, which is a potassium sparing diuretic; may be used as well. Taking diuretics can result in increased urination, so advise your patients to take the medication at the same time daily when they will have ready access to bathroom facilities.



# The Joint Commission Requirements

- Smoking Cessation education must be documented
- Assessment of LV Systolic Function: **Echo Done?**
- Written Discharge Instructions given and reviewed for all of the following:
  - Diet/Fluid Instructions
  - What to do if symptoms worsen
  - Weight monitoring instructions
  - When to follow up with MD after discharge
  - Activity level

The names of all discharge medications (VERY IMPORTANT)

# The Joint Commission Requirements (2)

- ACEI/ARB prescribed at discharge for left ventricular systolic dysfunction, i.e. EF <40% OR: documented contraindication:
  - ACEI allergy, ARB allergy, cough
  - Moderate or severe aortic stenosis
  - Renal insufficiency, Hypotension
- MD must document “No ACEI/or ARB due to \_\_\_\_\_.”  
RN may write as telephone order

# Care for the Patient and Education

- Start and follow admitting orders.
- On admission give patient the **Learning to Live with Heart Failure** Booklet (English/Spanish) and go over the booklet with them.
- Make sure the patient is weighed on admission and then daily by 6am; preferably standing weights.
- Make sure you are doing strict I&Os and following fluid restrictions and NPO orders, if indicated.



# Patient Education

- Educating patients on the prevention of heart failure will help increase both the length and quality of their lives.
- Explaining the diagnosis process and the importance of drug therapies used to prevent and to treat congestive heart failure is part of this process. This education should come from each member of the interdisciplinary team.



# Patient Education in Prevention While Admitted to the Hospital

While your patient is in the hospital, education about preventing a heart failure exacerbation in the future is key:

- Weigh yourself Daily at the same time each day.
- Limit your salt intake and restrict excessive fluids.
- Take **frequent rest breaks** for tasks that require physical activity. If you begin to experience difficulty in breathing and fatigue, stop and take a rest.
- Take medications as instructed by your physician.
- Smoking can damage blood vessels, and so it should be avoided. **Stopping smoking** can help lessen the risk of coronary artery disease as well as stroke.



# Dietary Modifications



- Dietary modifications may be aimed at weight loss; however there may also be a need to ***restrict the sodium intake*** as well. Salt substitutes and spices may help to provide flavoring in lieu of using higher amounts of salt. Sodium can be restricted in cooking as well.
- It is importance to ***read the labels on prepackaged foods***. These foods can contain significant amounts of sodium that you may not be aware of. For example, diet sodas may have fewer calories than regular soft drinks, but they still contain sodium. Canned goods and frozen foods can often contain sodium that must be considered when sodium restriction is an issue.

# Daily Weights at Home

***Weigh yourself daily***, if possible. Weigh yourself at approximately the same time each day and wear similar clothing. Use the same scale each time you weigh. Typically you can weigh after arising, urinating, and before eating breakfast. Record your weight so that it will be easier to spot any trends. If there is an ***increase of more than 3 pounds per day, notify your physician*** as it can be an early indication of the development of heart failure.



# Medication Education for Home

- Make every effort to *adhere to your medication regime*. Failure to do so may result in a worsening of your condition. Also, make sure all medication is renewed regularly and available at all times.
- If you are taking a *digitalis medication* such as Digoxin, *watch for an abnormally slow heartbeat*.
- *Know when you should contact your physician and when emergency medical services should be contacted*. Learn the potential signs and symptoms of heart failure from your physician or healthcare provider. Discuss these signs and symptoms with your healthcare surrogate, family members, friends, and neighbors.

# Discharge



- Continue HF teaching.
- Fluid Restriction Order.
- Daily Weights: Call physician if weight gain \_\_\_\_lbs. in \_\_\_\_days.
- Given patient discharge instructions from Micromedex: Heart Failure.
- ACEI or ARB ordered, not indicated or contraindicated and EF.
- If contraindicated state reason.
- Also, Care Coordination or Social Worker to arrange follow up care to Cardiologist or PCP.

# Discharge (2)

- A patient should call his/her physician if any of the following symptoms develop:
  - Increased shortness of breath for unknown reasons.
  - Sudden weight gain of 2-3 lbs in one day.
  - Frequent cough, especially when lying down.



# Follow-Up Appointments

- Discharge instructions should include the name and phone number of the primary care physician, and when to follow-up.
- Follow-up appointments should be scheduled prior to discharge by the care coordinator or social worker.
- Recent research shows that 58% of patients never made a follow-up appointment and were readmitted within 30 days.



# Medication Reconciliation

- The physician and RN should be addressing all home medications, all medications on the current MAR and any new prescriptions that are included on the Discharge Medication Form.
- ACEI/ARB prescribed at discharge for left ventricular systolic dysfunction, i.e. EF <40% OR: documented contraindication:
  - ACEI allergy, ARB allergy, cough.
  - Moderate or severe aortic stenosis.
  - Renal insufficiency, Hypotension.
- OR MD must document “No ACEI/or ARB due to \_\_\_\_\_.”  
RN may write as telephone order.



# Things That Are Important To Us....

- **Core Measures**

- Smoking Cessation
- Echo/Ejection Fraction
- Teaching
- Medications

- **Patient Education**

Daily Weights (preventing swelling)

- Medications (Oxygen therapy, etc.)
- Diet
- Exercise/ Activity
- Preventing Infections
- Talking with your PCP



# References

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# **Congratulations!**

You have successfully completed this portion of this course.

Take the post test and score at least 80% to successfully complete the test. After passing the test, please provide us with your valuable feedback in the brief evaluation so that we may continue to improve our courses. The evaluation is not required for successful completion of this course.

Thank you!

**HR Learning Management**