Welcome!

CareOregon Pharmacy

Heart Failure:
Turn Down the Volume!

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MEDS Ed™

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OREGON HEALTH & SCIENCE UNIVERSITY
OHSU

Today's Agenda

- Welcome and Introduction – 8:00
- HFpEF vs HFrEF; Self-care – 8:05
- Medication Review – 8:55
- **Break – 9:30**
- Disease Progression – 9:45
- Advanced Illness Care – 10:00
- Palliative Care – 10:10
- Questions – 10:45
- Closing – 11:30

Learning Objectives

1. Describe the 2 types of heart failure.
2. Identify key drug classes to treat heart failure.
3. Summarize the difference between NYHA Class II and IV.
4. Identify goals of palliative care for heart failure patients.

Scope of the Problem – Nationally

- Heart failure is a disease of epidemic proportions. Approximately 5.7 million Americans are currently living with heart failure*. 50% have decreased left heart function**.
- Approximately 1 million hospitalized a year***
- Average rate for 30 day all cause readmission on Hospital Compare is 24.7%.
- **12 billion dollars spent per year on 30 day readmissions alone.**

*AHA 2015 update
**2013 ACCP/AHA Guidelines
*** MedPAC 2008

CCO Metric

- PQI 08: Heart Failure Readmissions
  - (Prevention Quality Indicators)
- Rate of hospitalizations for heart failure (lower is better)
- Benchmark: 264.9 per 100,000 member years

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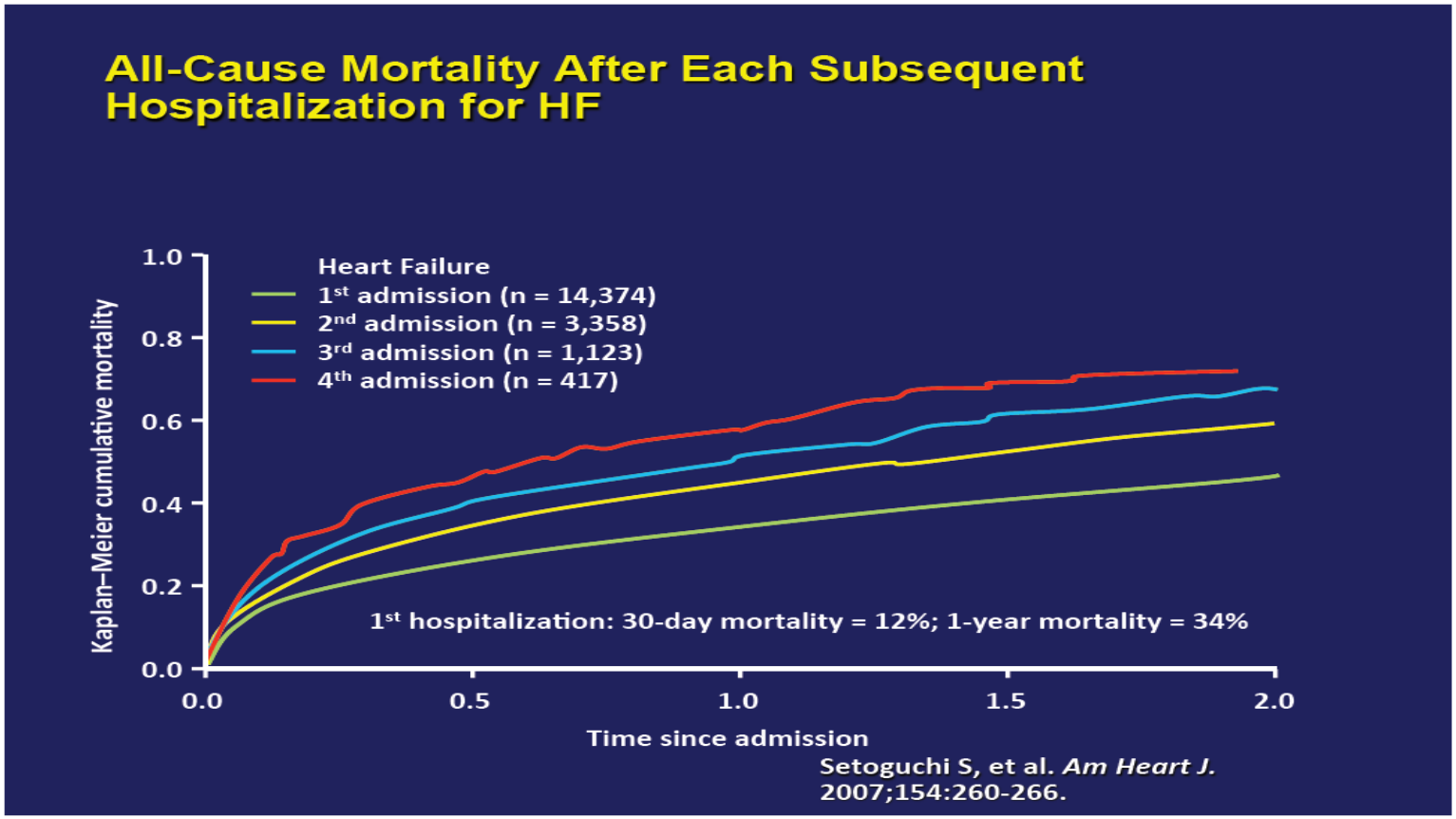
Hospitalization and Heart Failure



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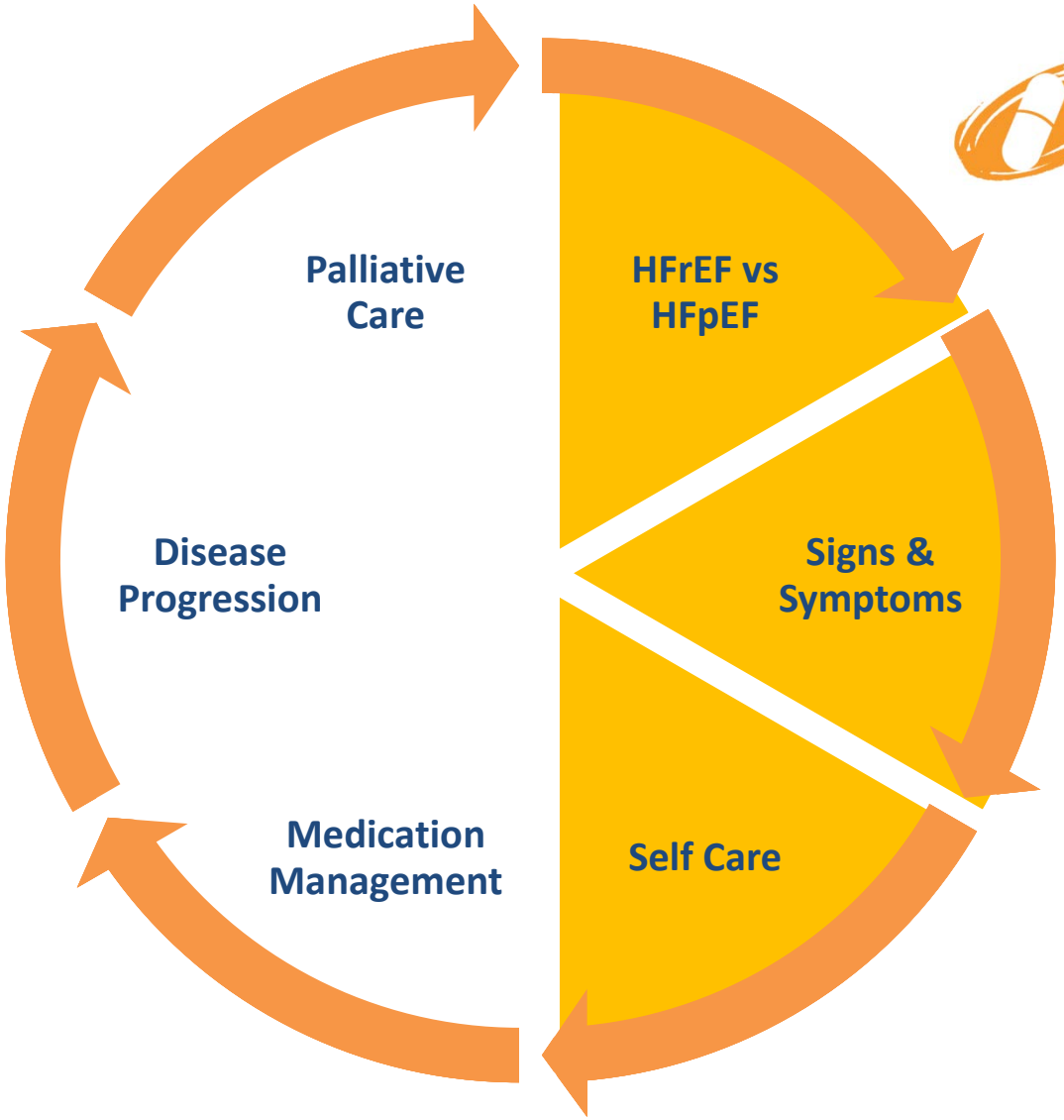
Palliative Care
HFrEF vs HFpEF
Disease Progression
Signs & Symptoms
Medication Management
Self Care

Jayne Mitchell, ANP-BC, CHFN

OHSU Heart Failure Program

Introducing Ms. J

49 year old female who is living with family. Here today for shortness of breath. History as follows:

- Age 14 hypertension (no treatment)
- BP ranging 160-180 systolic for years
- 4 children and pregnancies, first 3 with no problems
- 4th pregnancy felt awful, tired short of breath
- Short of breath, dyspnea on exertion and pedal edema after delivery- managed for months this way- no medications
- 1994 worsened shortness of breath, couldn't keep up at home had orthopnea and severe shortness of breath went to ER
- In ER noted to have cardiomegaly and pulmonary edema
- Echocardiogram ejection fraction (EF) 20%

What Is Heart Failure?

- Clinical syndrome that develops in response to myocardial insult, resulting in decline in the function of the heart (heart doesn't pump well and without intervention will get worse.)
- Heart failure triggers a neurohormonal response. Many of the medications are aimed at stopping this response.

Causes of Heart Failure:

- Coronary Artery Disease
- Hypertension
- Valvular disease
- Genetic
  - i.e. Duchenne muscular dystrophy, hypertrophic cardiomyopathy
- Congenital
- Peripartum
- Infiltrative (i.e. amyloidosis, hemochromatosis)
- Infections and inflammatory processes (i.e. Chagas disease)
- Metabolic disorders
- Toxins (i.e. alcohol, chemo, radiation therapy, illicit drugs)
- Incessant arrhythmias

Types of Heart Failure

- **HFrEF** – Heart failure **reduced** ejection fraction

REDUCED

- **HFpEF** – Heart failure **preserved** ejection fraction.

PRESERVED

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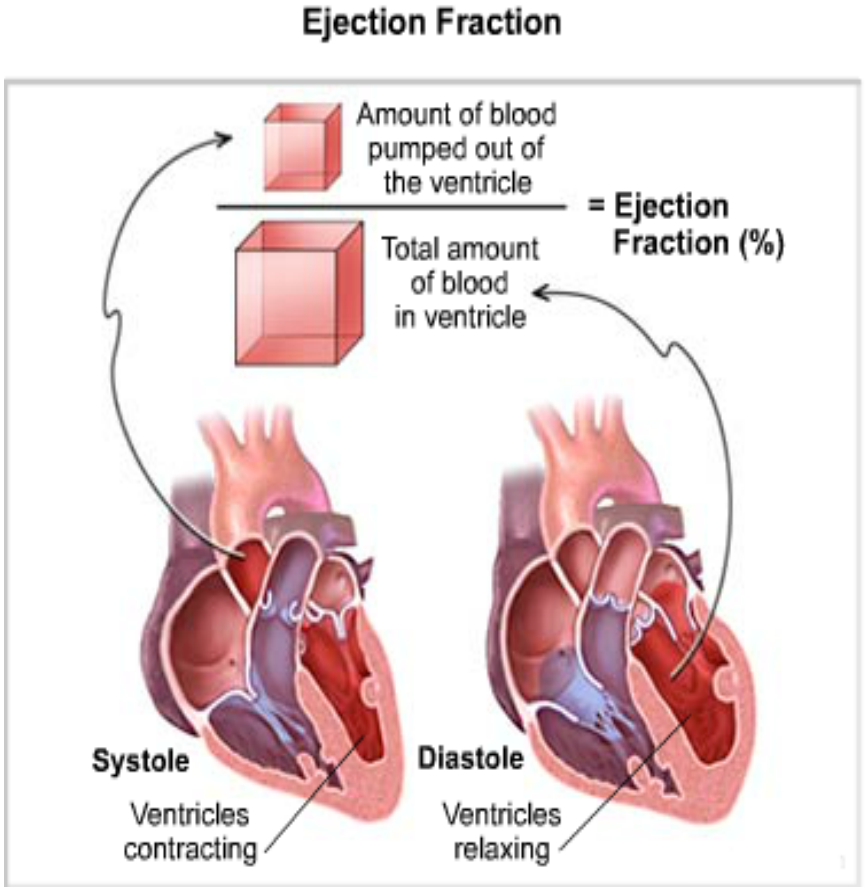
What Type of Heart Failure Does Your Patient Have?

Look at echocardiogram

- EF equals amount of blood heart is pumping out of ventricle with each contraction.
- Hint... look for “diastolic dysfunction” or “systolic dysfunction”
- …look for valve or structural problems.



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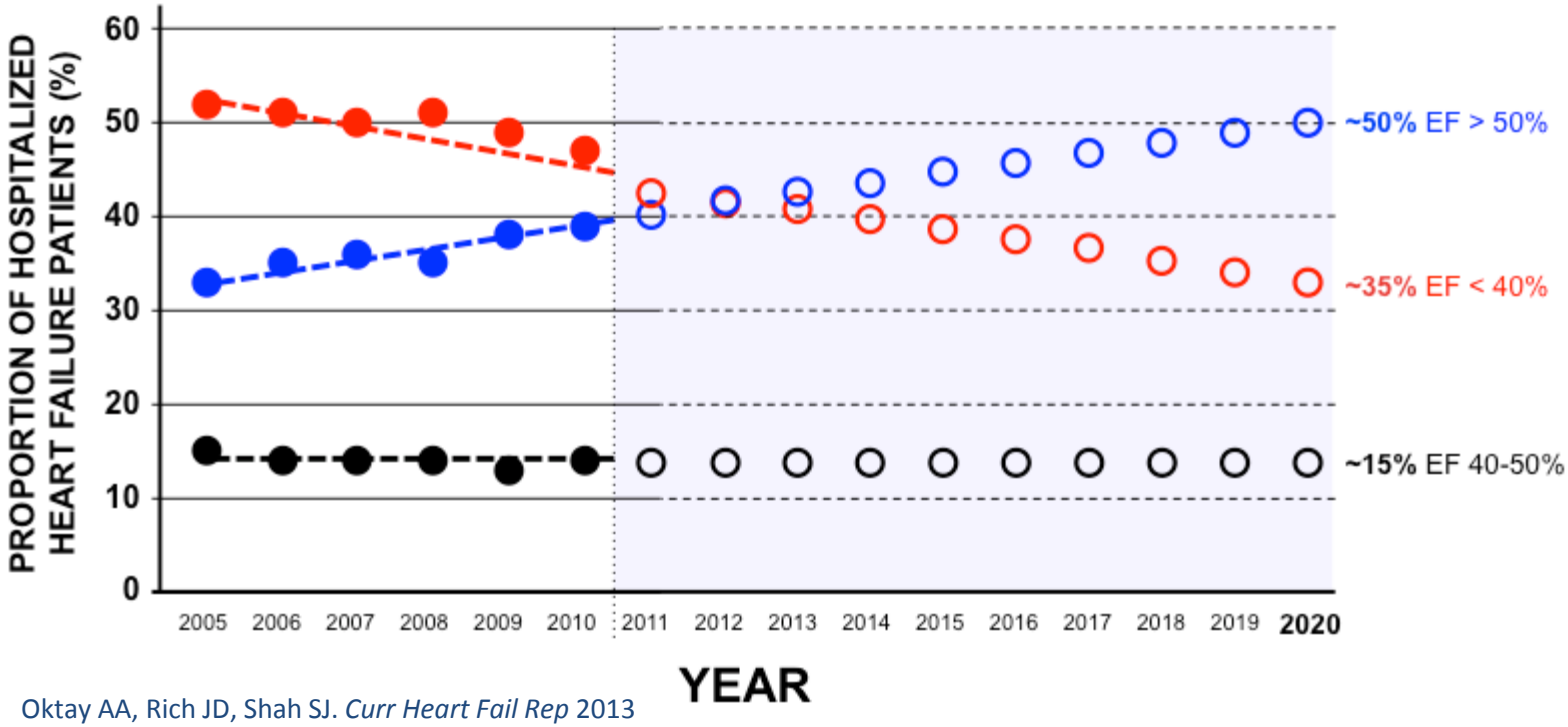
Hospitalized HFpEF Prevalence Increasing

GWTG-HF: N=110,621 patients hospitalized with HF
P<0.0001 for trend of increased HFpEF prevalence



Oktay AA, Rich JD, Shah SJ. *Curr Heart Fail Rep* 2013
Based on Steinberg et al. *Circulation* 2012

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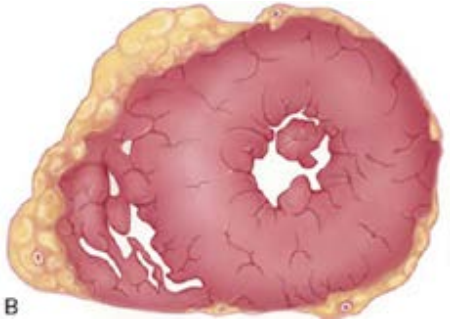
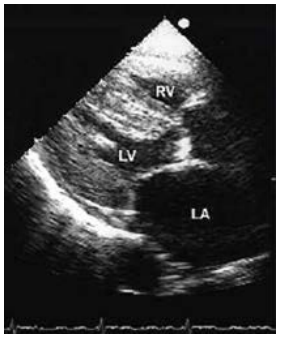
A Fundamental Issue: Are These Patients the Same or Different?

60 yo man with long history of HF
2 weeks of gradually worsening conditions BP 85/40

80 yo woman with long history of HTN
1 hour of sudden onset of symptoms
BP 185/120





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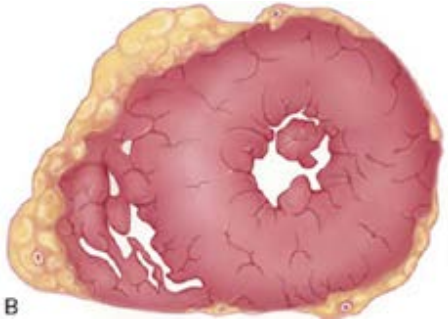
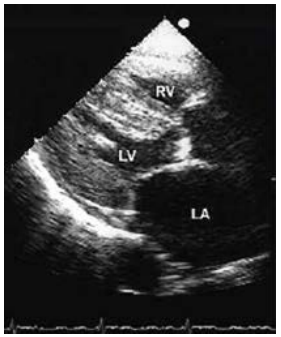
How Similar Are These 2 Patients?

60 yo man with long history of HF
2 weeks of gradually worsening conditions BP 85/40

80 yo woman with long history of HTN
1 hour of sudden onset of symptoms
BP 185/120



HFrEF



HFpEF

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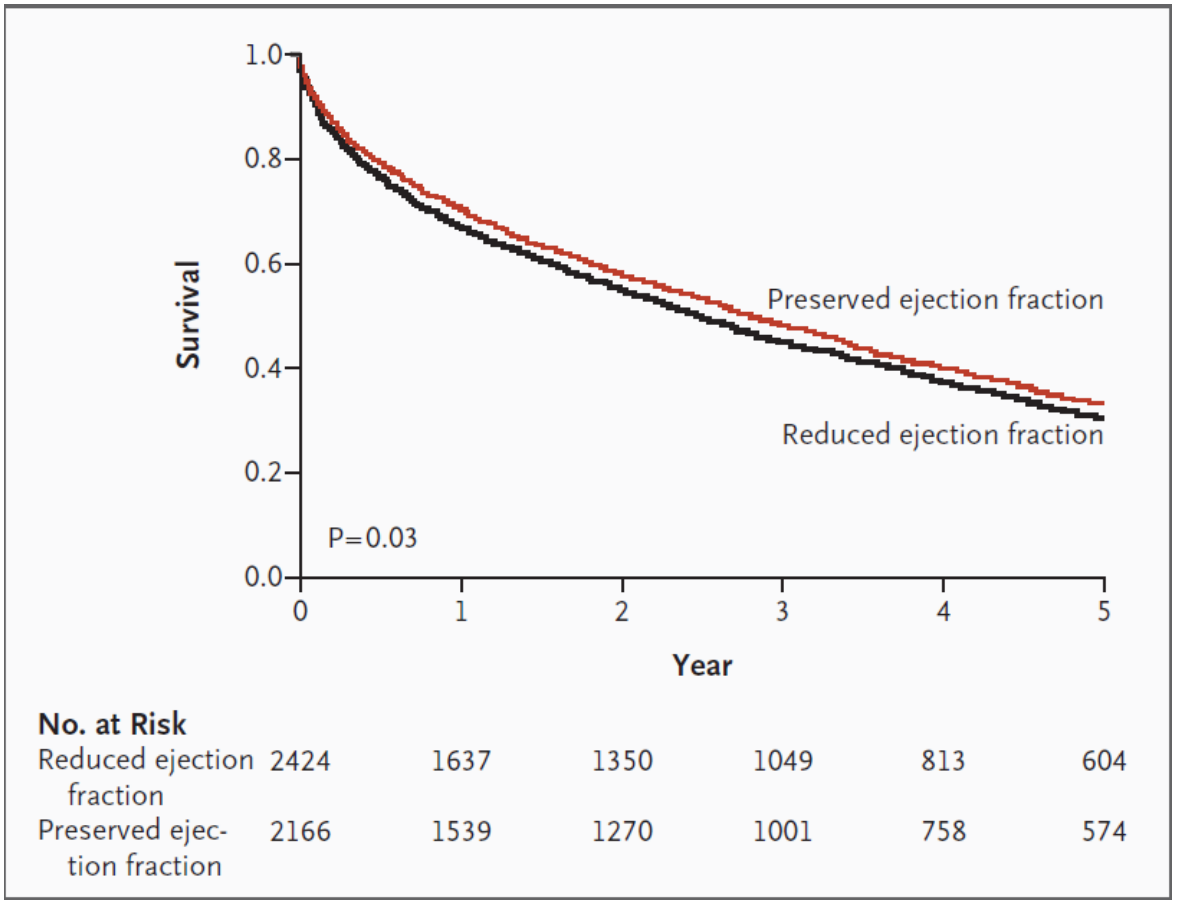
HF Survival: Poor Regardless of EF



No. at Risk

Reduced ejection fraction	2424	1637	1350	1049	813	604
Preserved ejection fraction	2166	1539	1270	1001	758	574

Dismal 35% survival at 5 years after HF hospitalization, regardless of LVEF

Owan T et al. N Engl J Med 2006; 355: 251-259

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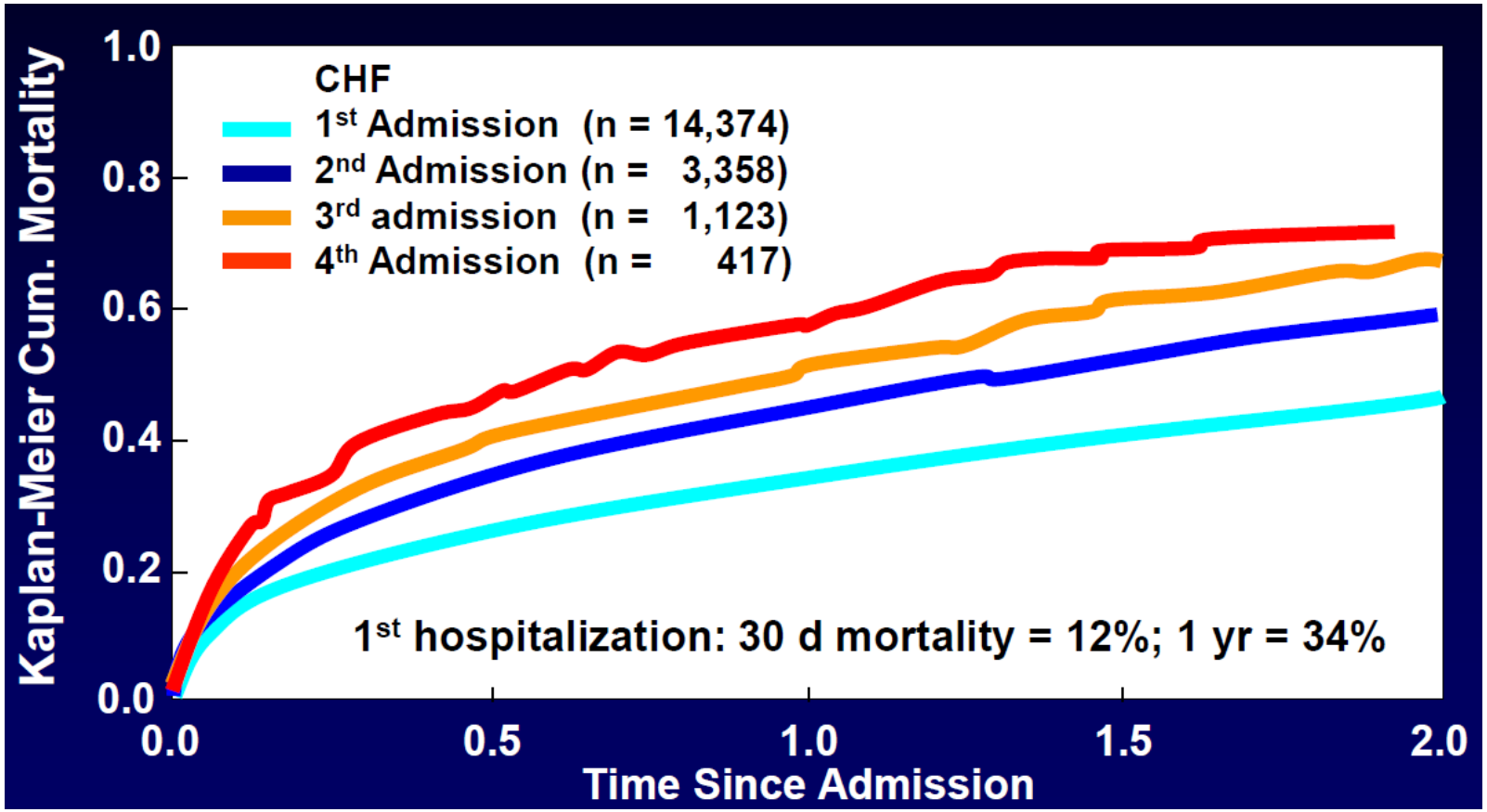
Hospitalizations = Poor Prognosis

All Cause Mortality After Each Subsequent Hospitalization For HF



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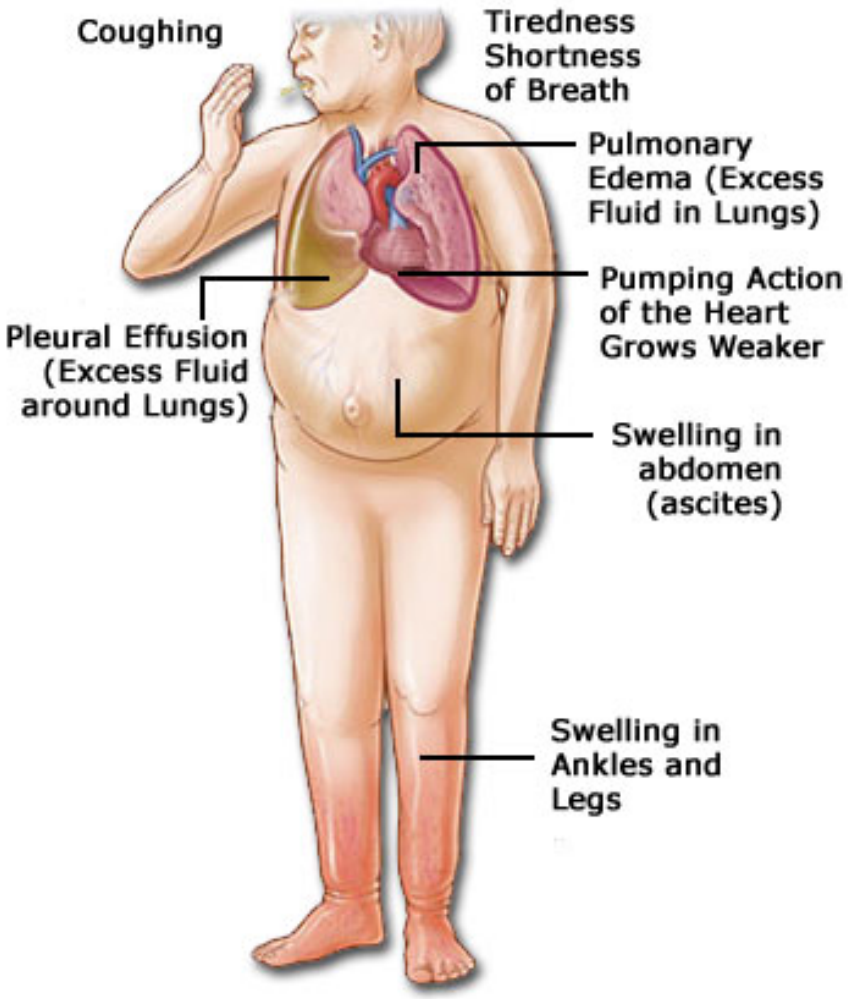
Physical Exam – Both Types



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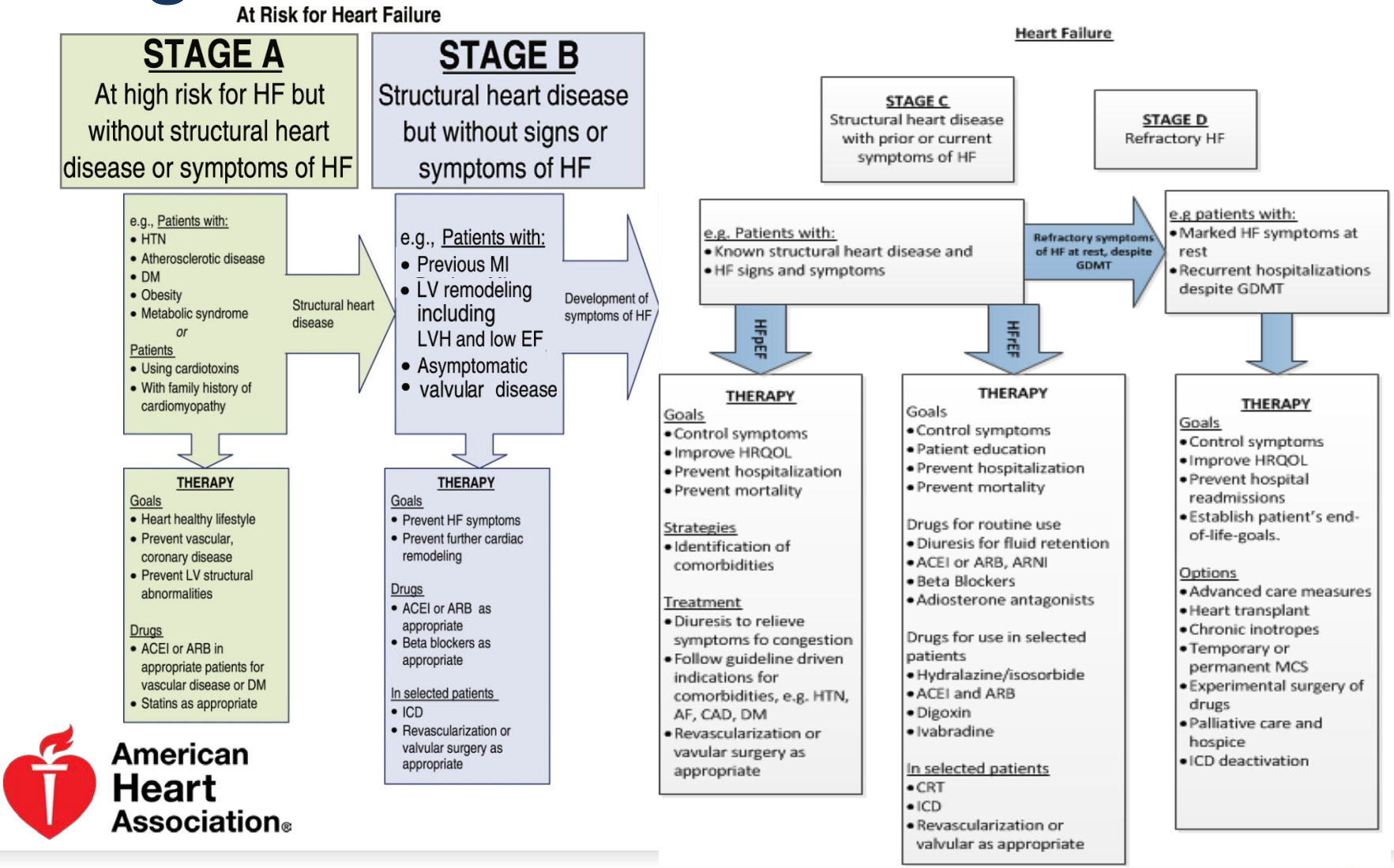
Symptoms – Both Types

- Shortness of Breath (SOB) at rest
- Dyspnea On Exertion (DOE)
- Orthopnea
- Paroxysmal Nocturnal Dyspnea (PND)
- Abdominal bloating
- Edema

Stages & Treatment of HF



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“HEFF – REFF”

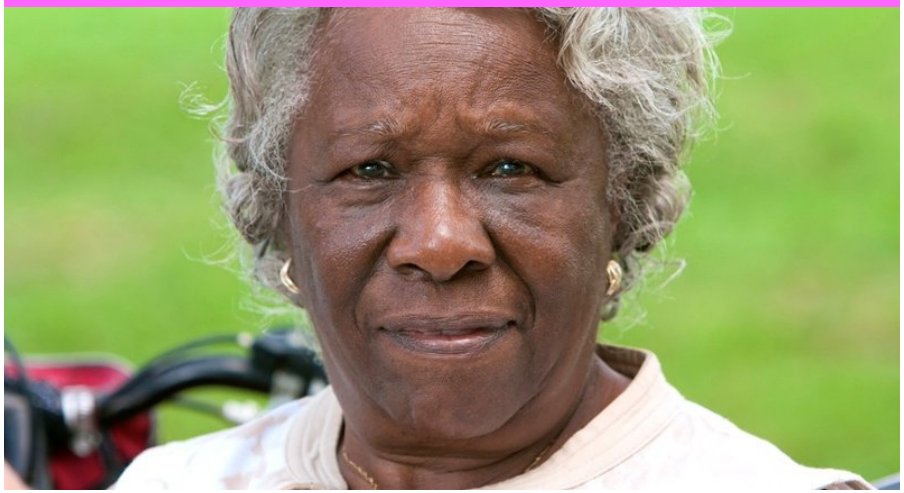
Heart failure reduced ejection fraction (HFrEF)

- Left ventricular systolic dysfunction (LVSD)
- Ejection fraction (EF) less than 40%
- Decreased stroke volume
- Decreased CO
- Backward failure
- Forward failure

“HEFF – PEFF”

Heart failure preserved ejection fraction (HFpEF)

In general HFpEF occurs in older women with a history of hypertension, Obesity, CAD, A-fib and DM also common comorbidities



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“HEFF – REFF”

Guideline Directed Medical Therapy includes:

- Diuretics to combat fluid retention
- ACEI or ARB (hydralazine and nitrates if cannot tolerate)
- Approved Beta Blockers
- Aldosterone antagonists

Selected pts

- Hydralazine and isosorbide dinitrate
- Digoxin

Selected pts

- ICD placement
- CRT
- Revascularization oF valvular surgery as appropriate

“HEFF – PEFF”

Strategies

- Identify and treat comorbidities

Treatment

- Diuresis to relieve symptoms of congestion
- Follow guideline directed indications for comorbidities

  (i.e. treat sleep apnea, hypertension, diabetes, etc.)
- Revascularization or valvular surgery as appropriate

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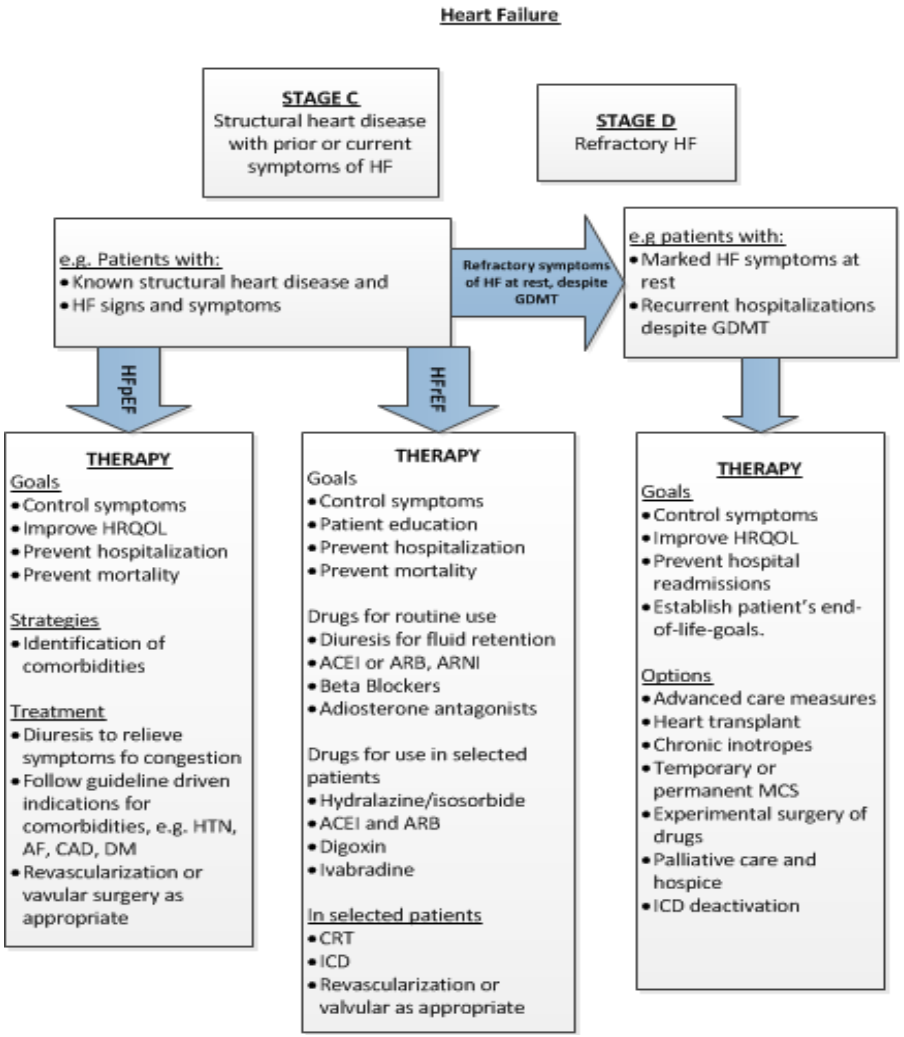
Stages of Heart Failure and Treatment



American Heart Association®

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Classification of Heart Failure

ACCF/AHA Stages of HF		NYHA Functional Classification	
A	At high risk for HF but without structural heart disease or symptoms of HF.	None	
B	Structural heart disease but without signs or symptoms of HF.	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
C	Structural heart disease with prior or current symptoms of HF.	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
		II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
		III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.
		IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.
D	Refractory HF requiring specialized interventions.		

Yancy, CW et al. 2013 ACCF/AHA Heart Failure Guideline

Ms. J

- What is likely to be the cause or etiology of her heart failure?

Etiology likely to be hypertensive or familial cardiomyopathy

- What type of heart failure does she have?

HFrEF (echo with EF less than 40%)

- What is the stage of heart failure she is in?

She is Stage C (structural changes and symptoms)

- She comes to office short of breath at rest before you send her to the emergency room, what NYHA class is she?

NYHA class IV (short of breath at rest)

Disease Trajectory – 50% Will be Dead in 5 Years

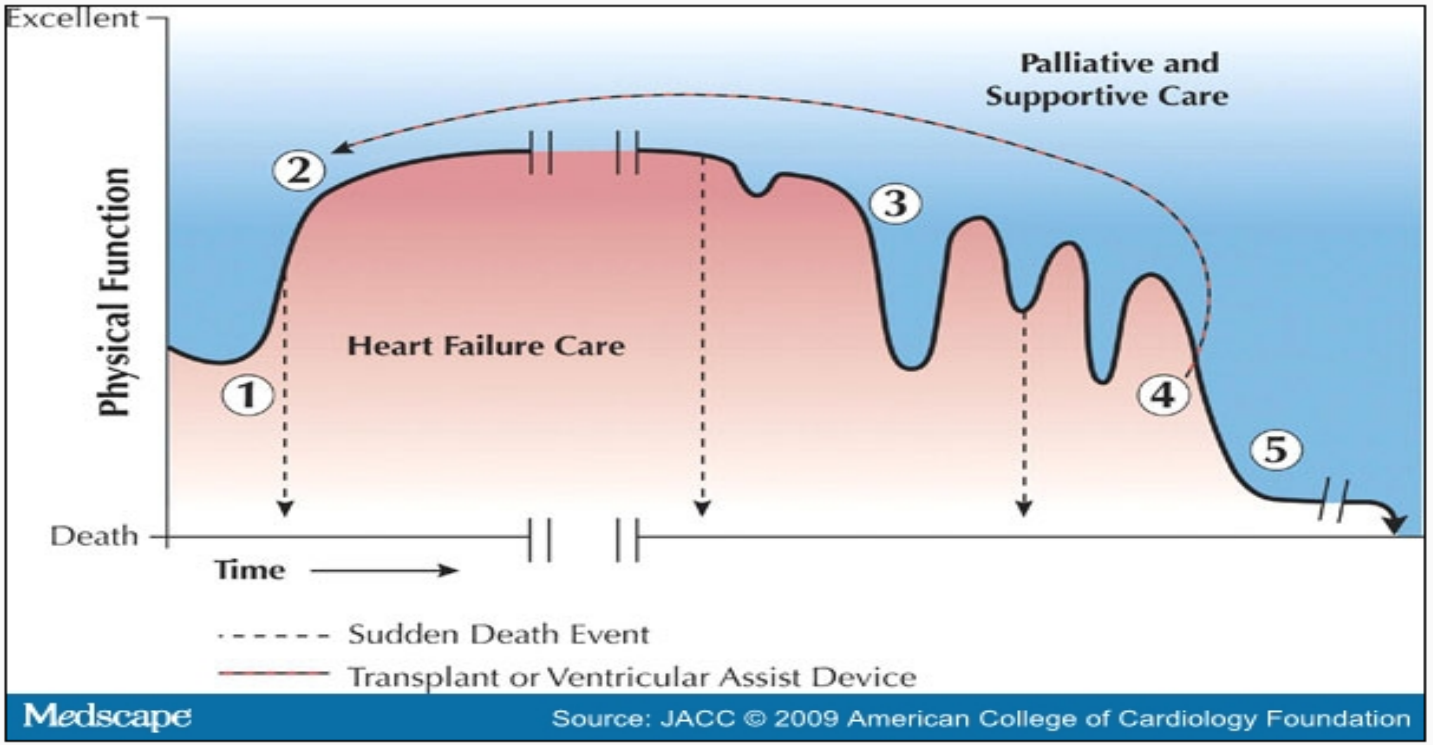

Figure 1.

Schematic Depiction of Comprehensive Heart Failure Care
Figure illustration by Rob Flewell.

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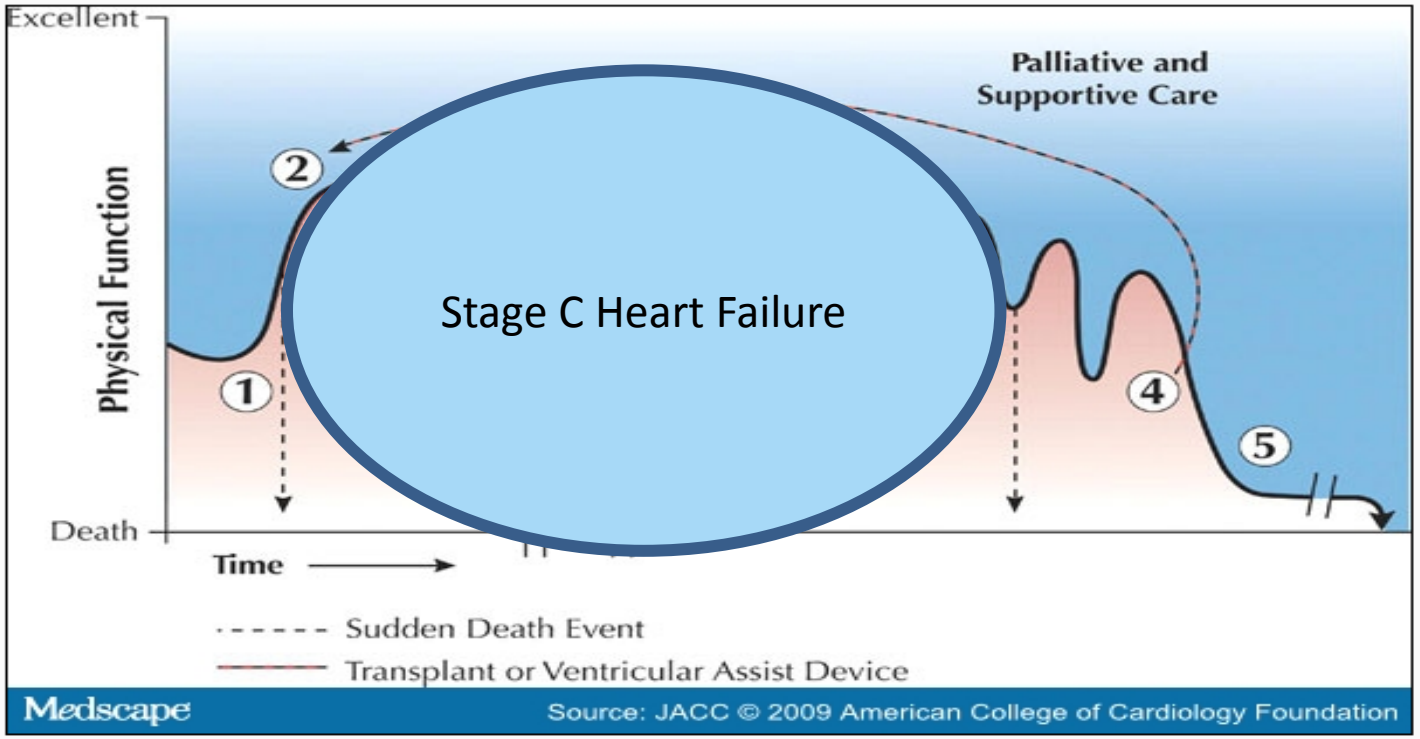
Disease Trajectory – 50% Will be Dead in 5 Years



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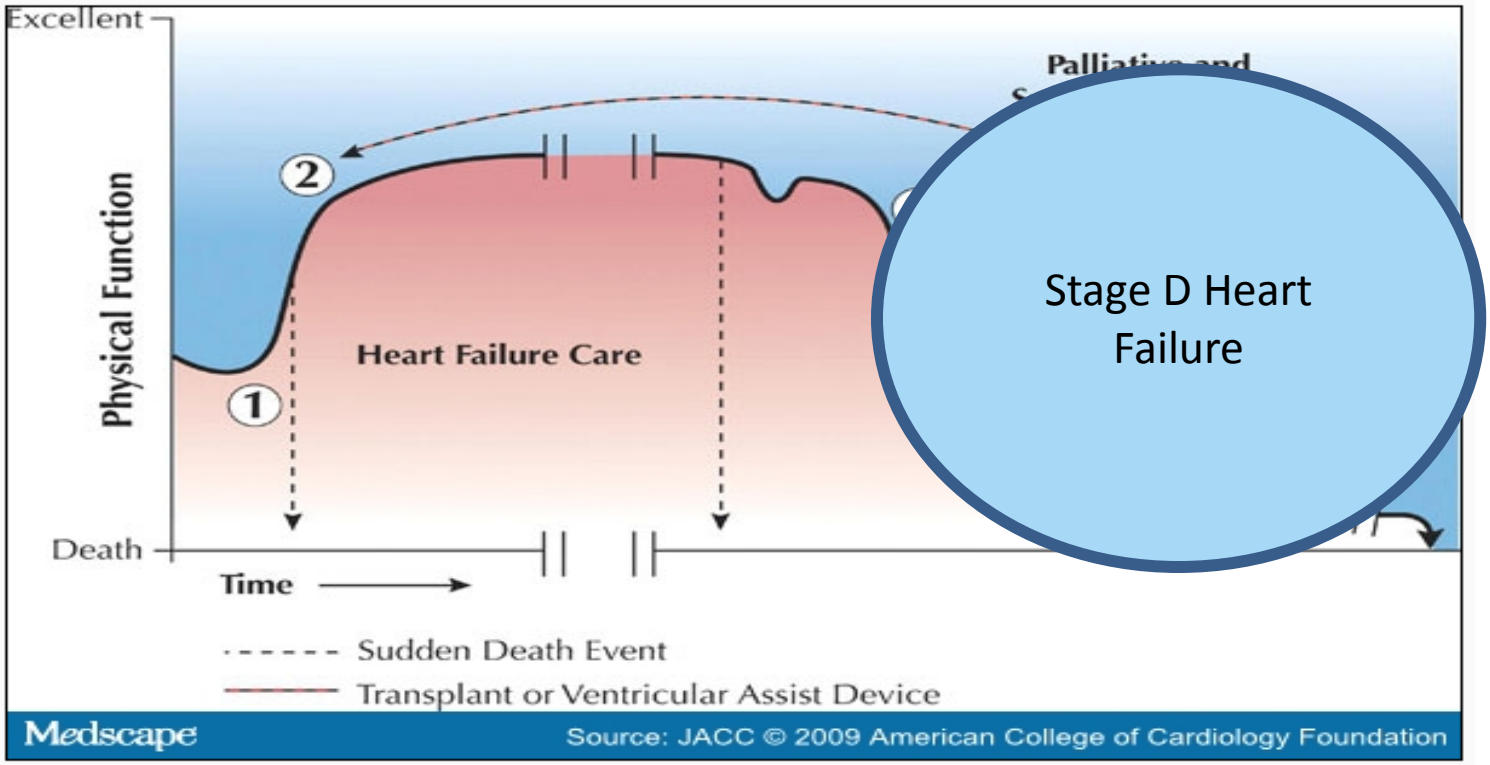

Figure 1.

Schematic Depiction of Comprehensive Heart Failure Care
Figure illustration by Rob Flewell.

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What are Goals of Therapy?

- Control symptoms
- Improve quality of life
- Prevent rehospitalization and mortality

How Are Goals of Therapy Addressed?

- Medications to stop neurohormonal process
- Patient should be euvolemic (not have extra fluid)
- Diet (salt=fluid)

Remember …HF brings WOES

- **W**eights
- **O**bservation
- **E**ducation of patient and family
- **S**ymptom recognition and reporting

Compensatory Mechanisms

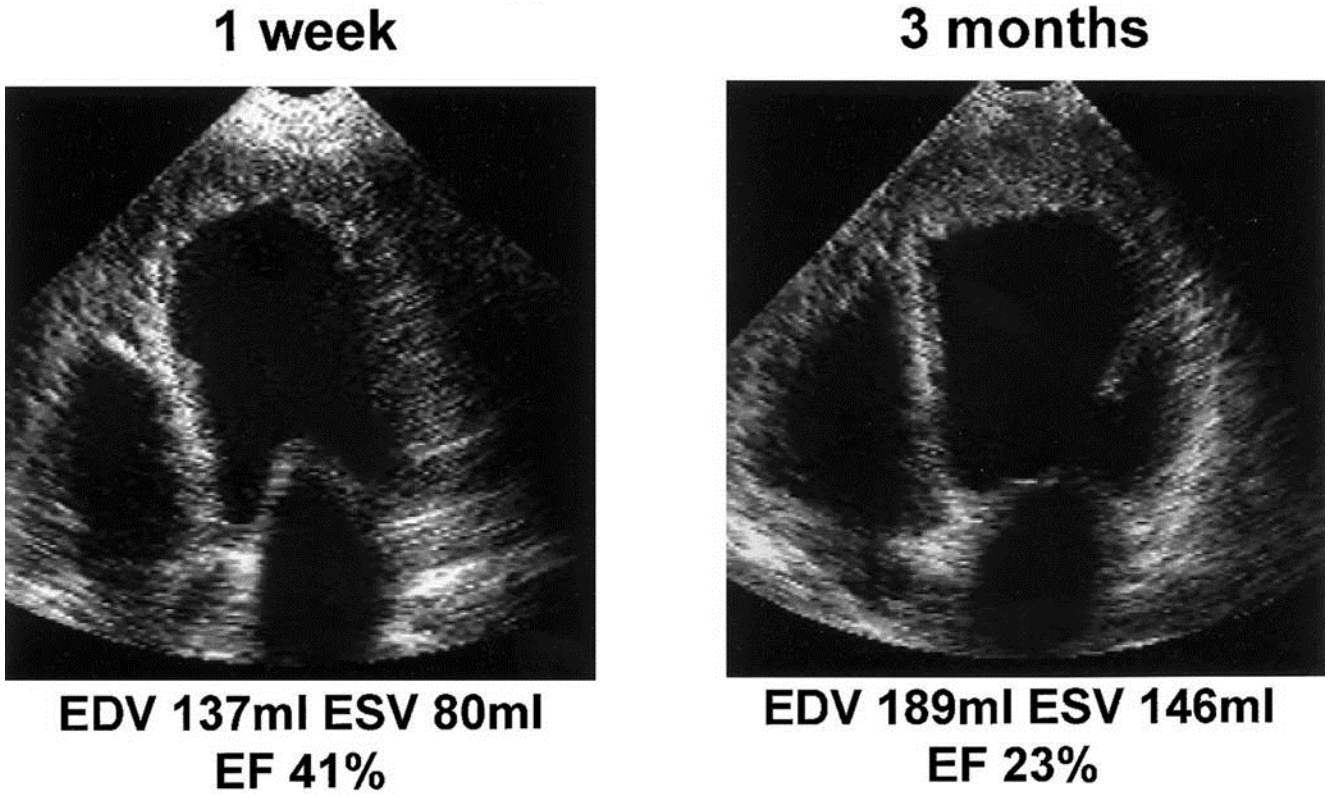
Neurohormonal activation

- Sympathetic nervous system
  - o Vasoconstriction
  - o Inotropism (increased contractility)
- Chronic SNS leads to increased myocardial O2 demand
  - o Activation of Renin Angiotensin-Aldosterone system (RAAS)
  - o Natriuretic peptide system
  - o Vasopressin
  - o Endothelin

Dysregulation of immune system

- Immune activation of pro-inflammatory cytokines

Left Ventricular Remodeling Post MI



American Heart Association.

Sutton M, Sharpe N. Circulation 2000;101:2981-2988

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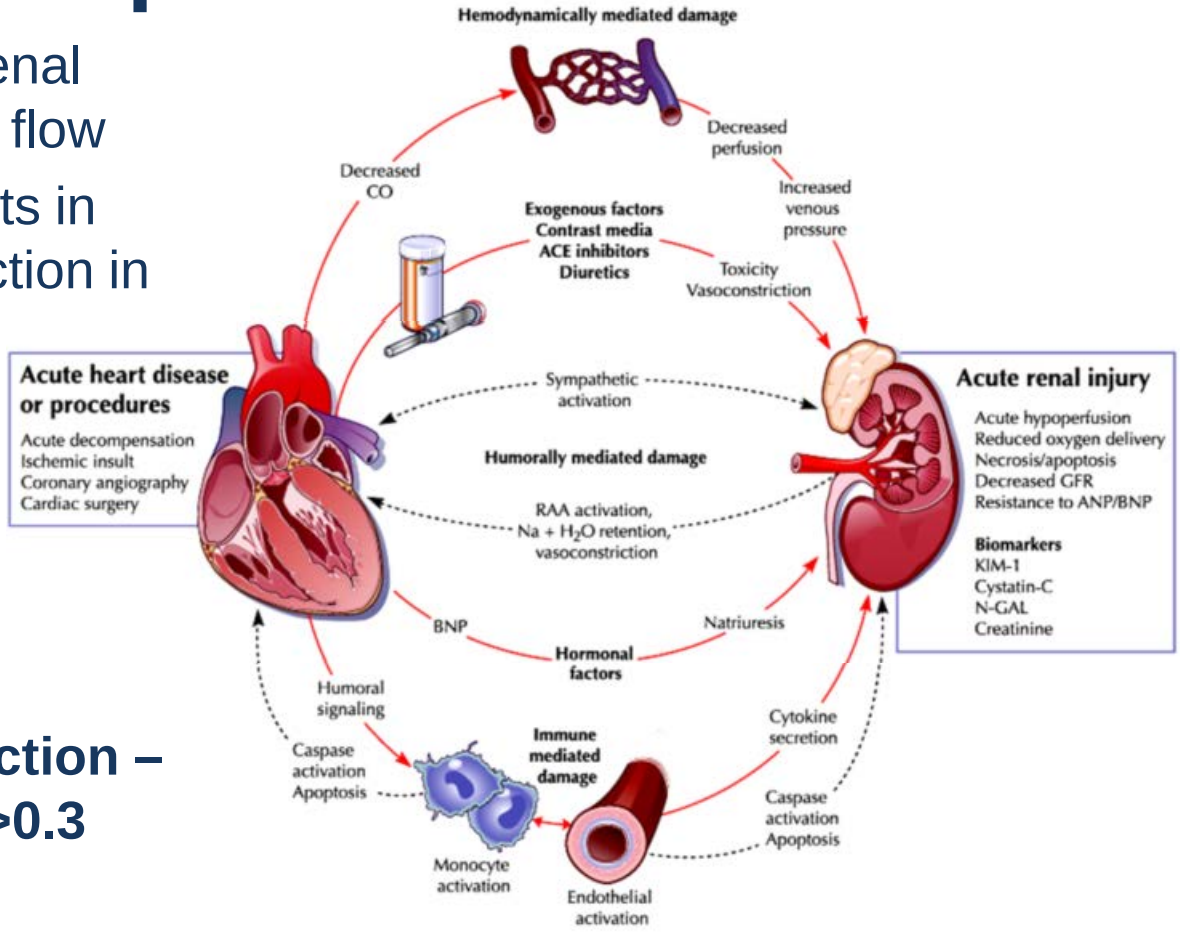
Factors That Affect Cardiac Performance Impaired Renal Function

- Main determinant of renal function is renal blood flow
- Reduction in CO results in disproportionate reduction in renal perfusion
- Leads to decreased GFR & Increased Cr.
- Leads to neurohormonal activation
- **Worsening renal function – change in serum cr >0.3 mg/dl or >25% over baseline**



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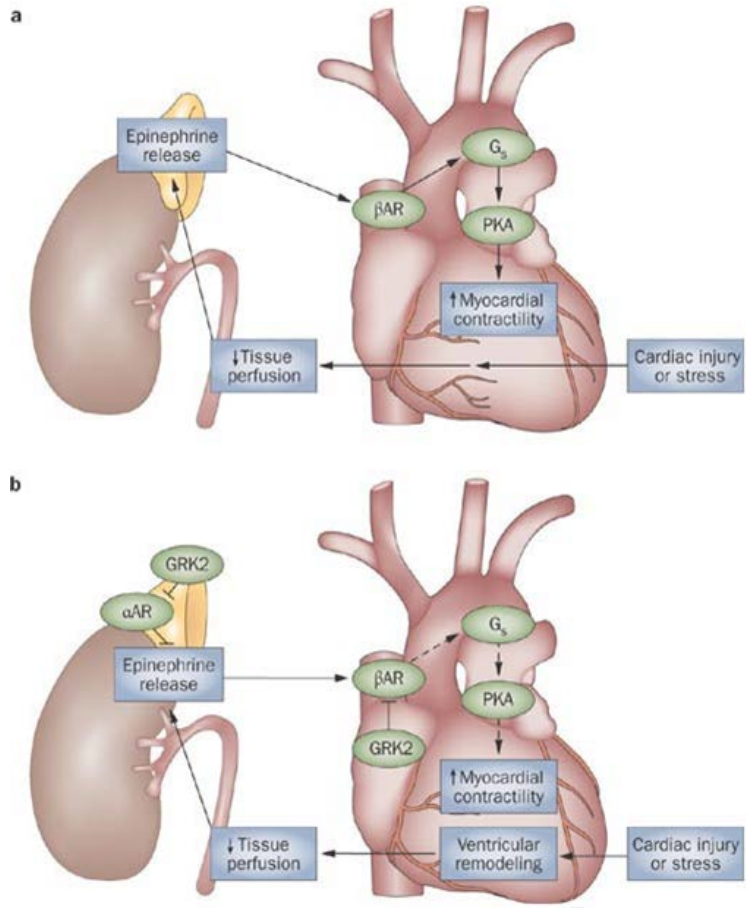
Factors That Affect Cardiac Performance

Activation of Sympathetic Nervous System



- Fight or flight mechanism
- Elevates heart rate
- Heart works harder
- Leads to cell death

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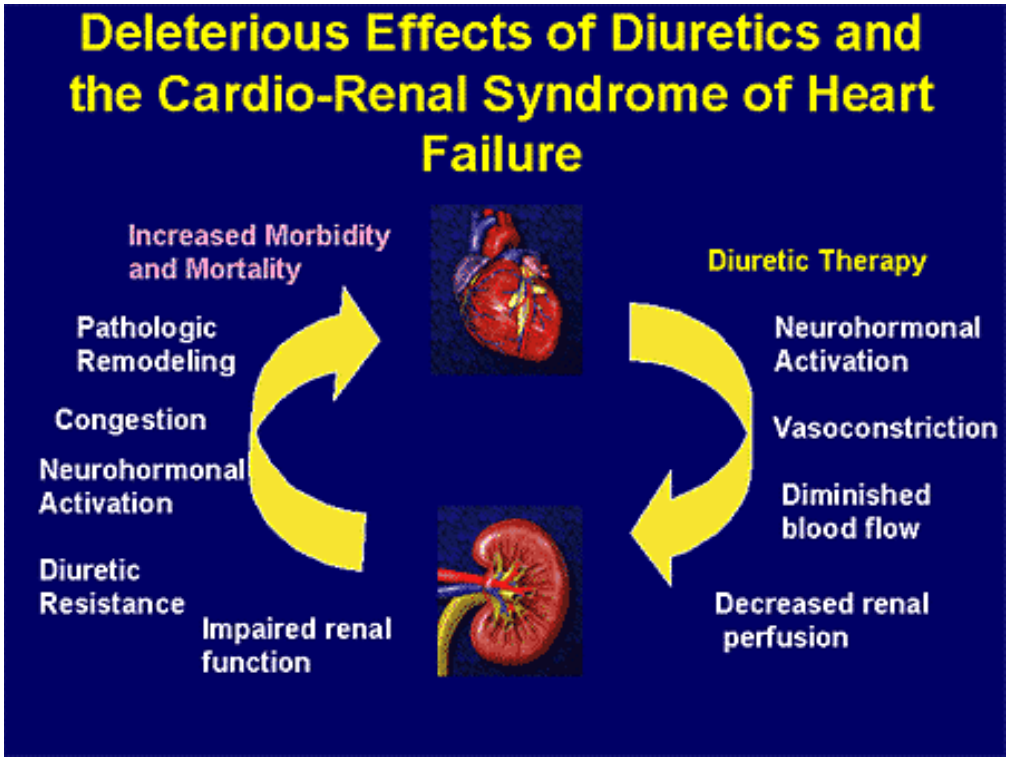
Factors That Affect Cardiac Performance Diuretic Resistance

- Persistent congestion despite diuretic therapy
- Distal tubules develop hypertrophy
- Oral absorption of loop diuretics is impaired in the setting of gut hypoperfusion and edema



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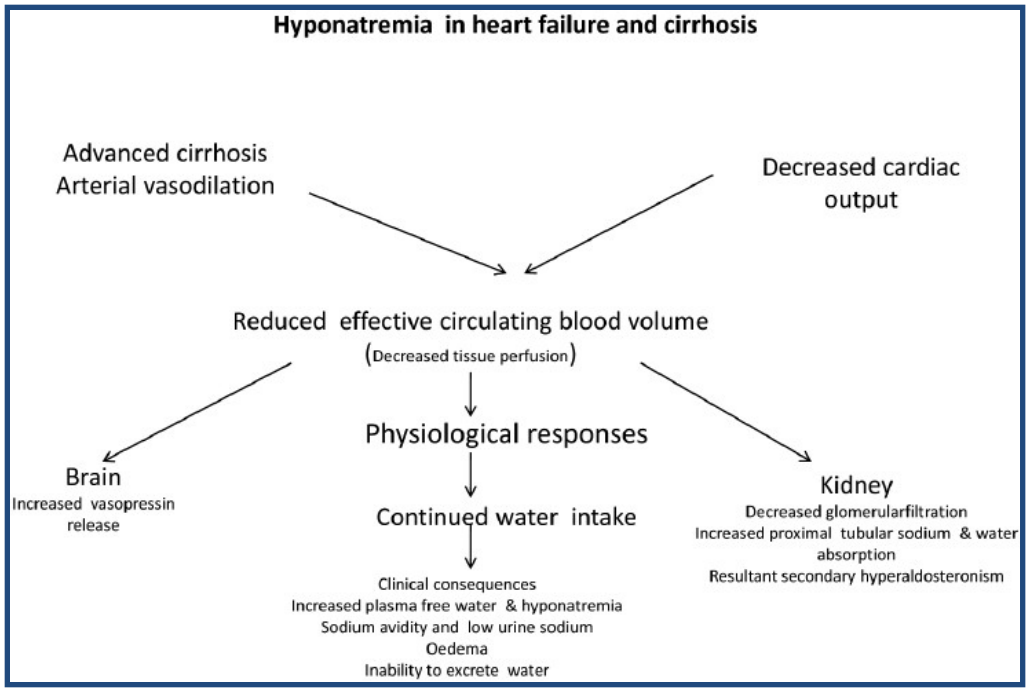
Factors That Affect Cardiac Performance Hyponatremia

- Defined as serum sodium concentration less than 136 mmol/L
- Mild hyponatremia seen in approx 25 % of pts with HF
- Poses significantly greater risk of death post hospitalization
- As CO decreases vasopressin release from pituitary is stimulated leading to water retention
- High dose diuretics and increased water can exacerbate



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Self-Care

The process of making decisions about symptoms when they are recognized

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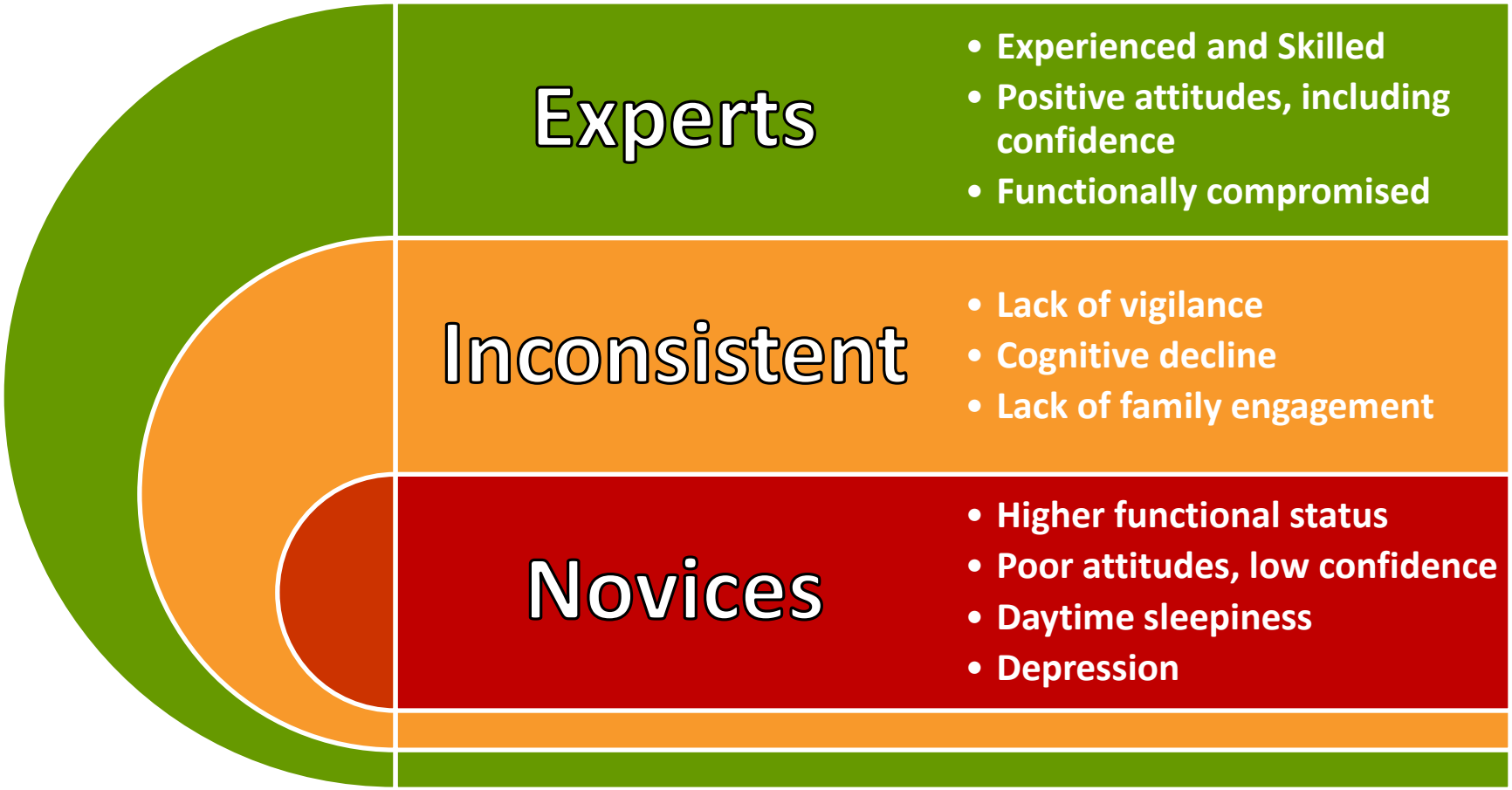
Nursing Goal – Teach Patient/Family To Be Experts



Source: Nat Rev Cardiovasc Med © 2011 Nature Publishing Group

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Why Focus On Self-Care?

Better self care results in improved outcomes: reduced health care cost, length of stay for HF by as much as a 39-56%

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Why Keep It Basic?

What we say to heart failure patients

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Why Does It Matter?

Early recognition of weight change and/or HF symptoms

- improves outcomes
- reduces re-hospitalizations
- improves patients' quality of life & functional status.

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When To Notify Provider?

Symptoms

- SOB
- DOE
- Orthopnea (using more pillows)
- PND (waking up in the middle of the night and can't breathe)
- Dizziness or lightheadedness with rapid rising
- Abdominal distention and bloating
- Edema

Weight Changes
± 3 lbs or more in one day
± 5 lbs or more in one week

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Teaching Fundamentals

- Daily weights – have patients record also to encourage self-care
- Symptom recognition and reporting – help patients recognize when symptoms arise or worsen and teach them when to consult their providers
- Low sodium diet – so we don’t have to use as much of the water pill (Water pills are hard on kidneys)
- Medications – goal is good system in order to take meds. Basic understanding of meds.
- Activity – encourage!

What About Fluid Restriction?

- Stage D per guidelines
- With hyponatremia
- Selected cases

Heart Failure Management Zones

Help yourself feel better and stay out of the hospital by assessing what zone you are in: Green, Yellow or Red.

EVERY DAY:

- Weigh yourself the morning before breakfast and write it down
- Take your medicine
- Check for swelling in your feet, ankles, legs and stomach
- Eat low-salt food
- Balance activity and rest periods
- Determine which zone you are in: Green, Yellow or Red

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GREEN ZONE:

You are in the green zone if you have:

- No shortness of breath
- No swelling
- No weight gain
- No chest pain
- No decrease in your ability to maintain your activity level

Action:

- Continue taking your medication as ordered
- Continue daily weights
- Follow low salt diet
- Keep all provider appointments

YELLOW ZONE:

You are in the yellow zone if you have:

- Weight gain of 3 or more pounds in 3 days
- Increased cough
- Increased swelling
- Increase in shortness of breath with activity
- Increase in number of pillows needed
- Anything else unusual that bothers you

Action:

- Call your provider if you are going into the yellow zone; you may need an adjustment of your medications.
- Contact information for physician, nurse coordinator or home health nurse:

NAME: _____

NUMBER: _____

INSTRUCTIONS: _____

_____

RED ZONE:

You are in the red zone if you have:

- Unrelieved shortness of breath: shortness of breath at rest
- Unrelieved chest pain
- Wheezing or chest tightness at rest
- Need to sit in chair to sleep
- Weight gain or weight loss of more than 5 pounds in 2 days
- Confusion

Action:

- Call your provider IMMEDIATELY; you need to be evaluated by a provider right away.
- Contact information for provider:

NAME: _____

NUMBER: _____

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Daily Weight & Zones Calendar

MONTH: April 2017

- Record your weight on this calendar every morning after you urinate and before you have breakfast.
- Place a check in the box that represents the color of your zone that day.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		162.6	160.2	160.8		
		✓	✓	✓		
		164.0	163.4	164.0	164.2	164.2
✓	✓	✓	✓	✓	✓	✓
167.2	166.8	166.2	164.8	166.0		
✓	✓	✓	✓	✓		

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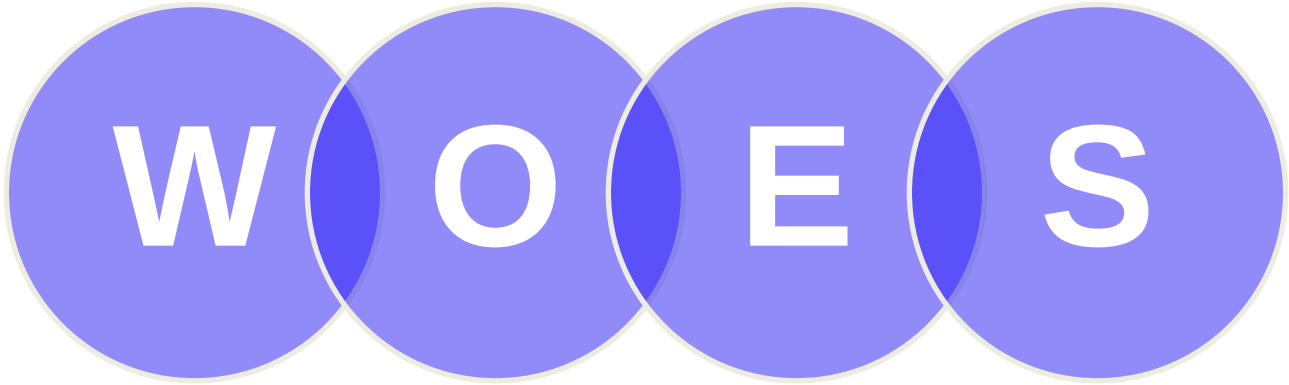
Keep it Simple



- **W**eights
- **O**bservation
- **E**ducation
- **S**ymptoms

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Ms. J Comes To My Office

- After hospital discharge…
- She lost 20 pounds in the hospital. Feeling much better.

- What can I do to help… Stage C, NYHA class III now?

Ms. J Comes To My Office

Goals of therapy

- Control symptoms
  - Teach patient to report symptoms
- Patient education
  - Optimize self care and encourage consulting behaviors
- Prevent hospitalization
  - Self care and optimize meds
- Prevent mortality
  - Optimize meds (can I up titrate anything?)

Please hold questions – thanks!

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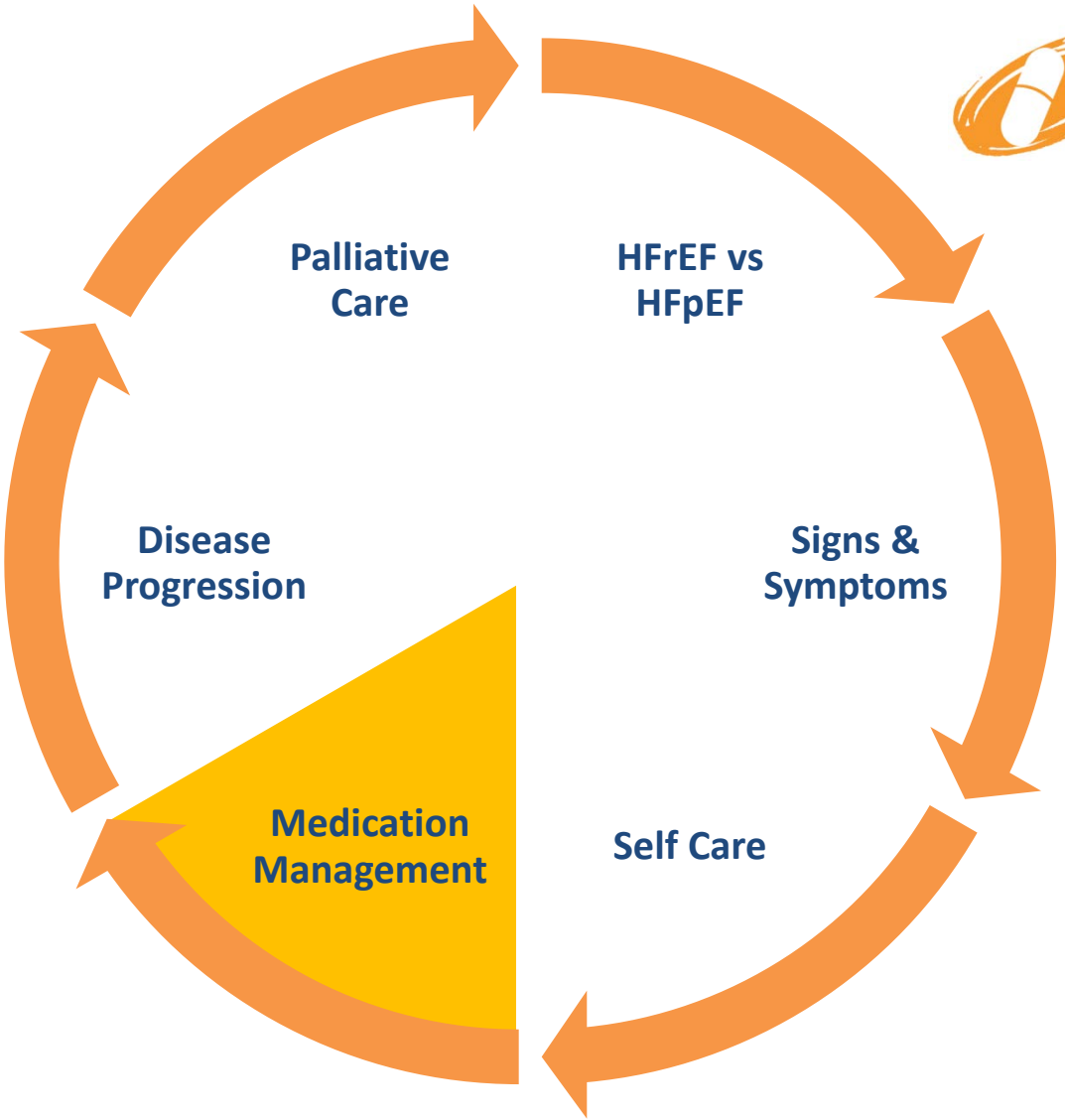
Palliative Care
HFrEF vs HFpEF
Signs & Symptoms
Self Care
Medication Management
Disease Progression

Medication Management

Pamela Chukwuleta, PharmD
Pharmacy Resident
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My Easy Drug System™ (MEDS) Chart

Name: Mark Grace

Date:

Primary Doctor: Dr. Harry Carry

Any Allergies?

Which medications matter most to you?

Drug name	Why I take this	How do I feel about it?	N
Lisinopril	Heart Failure	○ ☺ ◉ 😐 ○ ☹	
Losartan	Heart Failure	○ ☺ ◉ 😐 ○ ☹	
Ibuprofen	Back Pain	○ ☺ ○ 😐 ◉ ☹	
		○ ☺ ○ 😐 ○ ☹	
		○ ☺ ○ 😐 ○ ☹	

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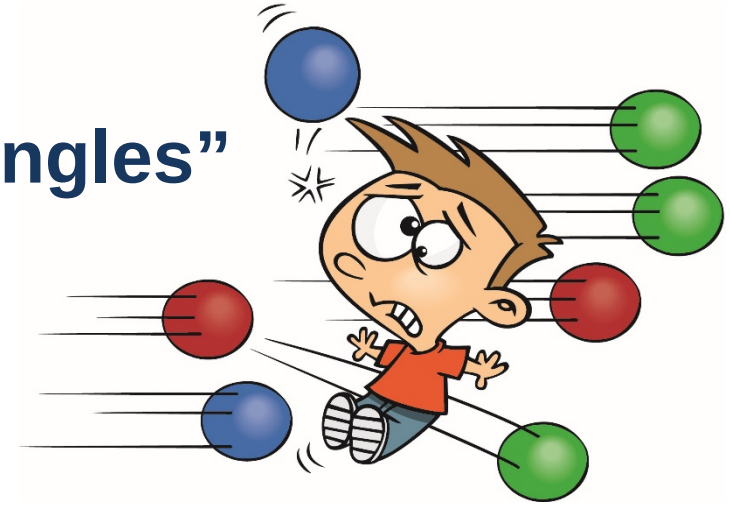
Take Home Points

- What medications should the patient be taking?
- What medications should be avoided?
- Tools to address patient questions

Treatment Goals

- Prolong life
- Slow disease progression
- Prevent hospitalizations
- Reduce symptoms

Meds target “from different angles”



Medication Regimen

Prolong life

- ACE or ARB or ARNI
- Beta Blocker
- Aldosterone Antagonist
- Hydralazine/nitrates
- Titrate to target doses

Reduce symptoms

- Diuretics
- Digoxin
- Ivabradine
- Dose based on symptoms
- Less evidence on morbidity/mortality

Medications: HFrEF vs HFpEF

HFrEF

Guideline **D**irected **M**edical **T**herapy:

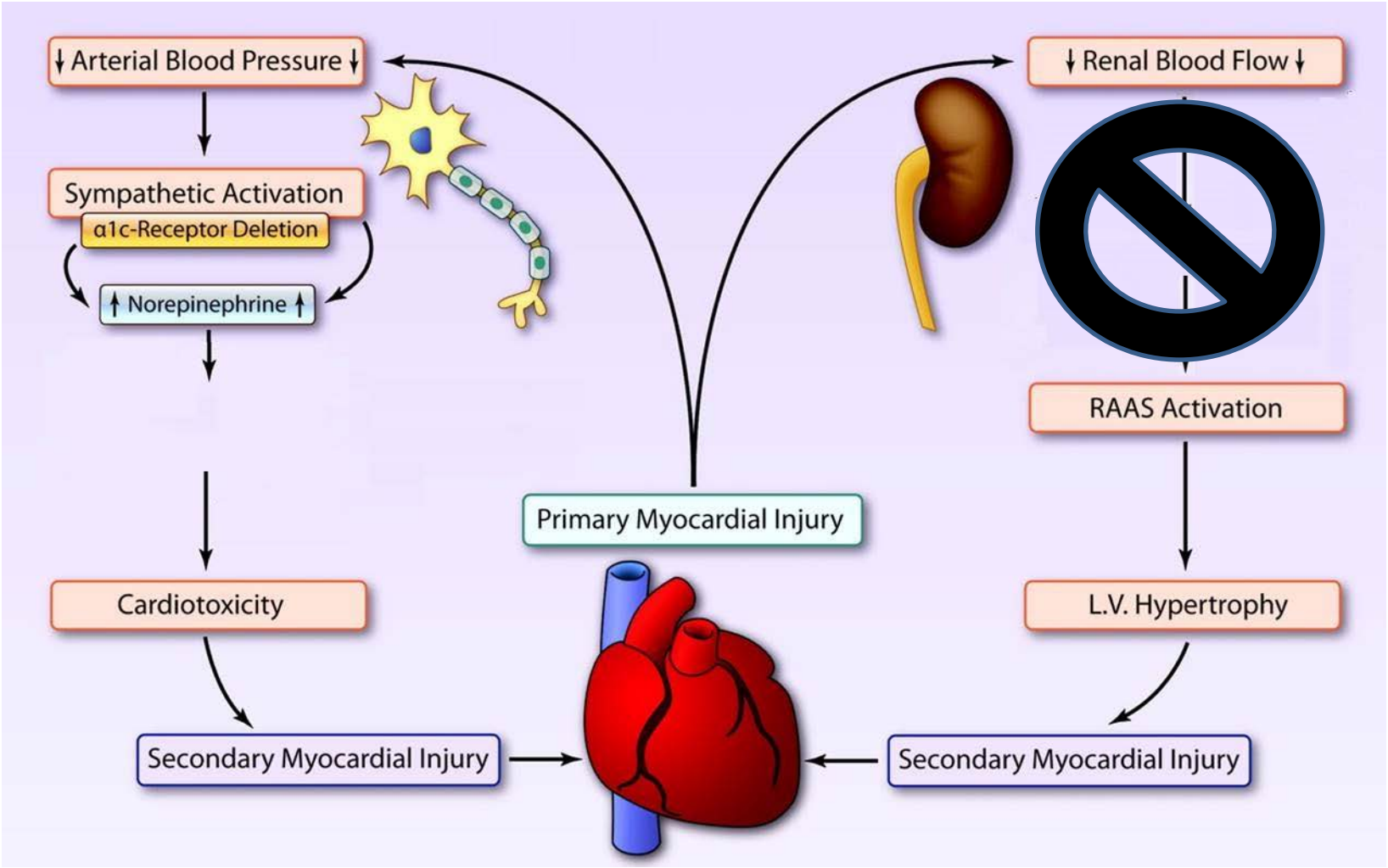
- ACE or ARB or ARNI
- Beta Blocker
- Aldosterone Antagonist
- Hydralazine/Nitrates
- Diuretic

HFpEF

- Treat co-morbidities
  - HTN, DM, Sleep apnea
  - ACE, ARB, and/or beta blocker in HTN
- Diuretic

All Patients: Self-Care & Smoking Cessation

ACEs & ARBs: How They Help



ACE Inhibitors: The “Prils”

- Benefits vs placebo
  - Improve survival by 20-30%
  - Fewer hospitalizations
  - Improve symptoms
  - Improve quality of life
- May reduce dose
  - Patient still receives valuable benefits

Generic	Brand
Captopril	Capoten
Enalapril	Vasotec
Fosinopril	Monopril
Lisinopril	Prinivil, Zestril
Perindopril	Aceon
Quinapril	Accupril
Ramipril	Altace
Trandolapril	Mavik

ACE Inhibitors Cont.

- Side Effects: dry cough, dizziness, hyperkalemia, angioedema
- Contraindications: history of angioedema, pregnancy, bilateral renal stenosis

Monitoring: serum creatinine, potassium

- **Serum creatinine "bump" after starting**
- **May resolve within 1-2 weeks**
- **Potassium increase**
- **When to worry:**
  - **Serum creatinine > 2.5 or > +25% change from baseline**
  - **Potassium > 5**

ARBs: The “Sartans”

- Less studies than ACEs
- Similar benefits: reduced morbidity/mortality
- Alternative when intolerant to ACEs
- ACE + ARB = more side effects, no benefit

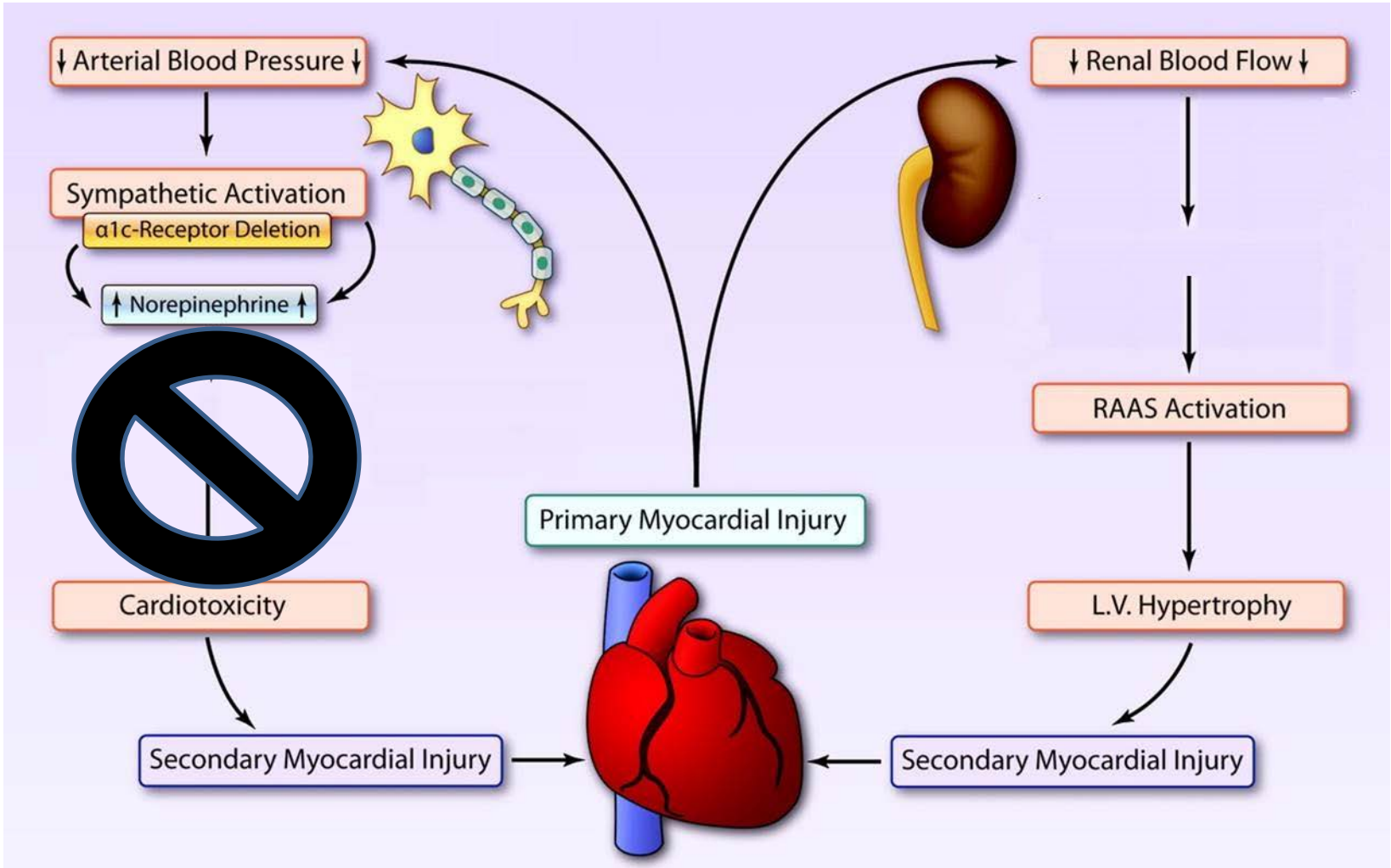
Generic	Brand
Candesartan	Atacand
Valsartan	Diovan
Losartan	Cozaar

ARBs Cont.

- Side Effects: dizziness, headache, diarrhea, hyperkalemia
- Contraindications: pregnancy, bilateral renal stenosis

Monitoring: serum creatinine, potassium

Beta Blockers: How They Help



Beta Blockers: The “Olols”

Benefits

- Decreased mortality- 35-65%
- Fewer hospitalizations
- *Reverse remodeling*
- Improve symptoms & quality of life

Generic	Brand
Bisoprolol	**Zebeta**
Carvedilol	**Coreg**
Carvedilol CR	**Coreg CR**
Metoprolol succinate	**Toprol XL**

Beta Blockers Cont.

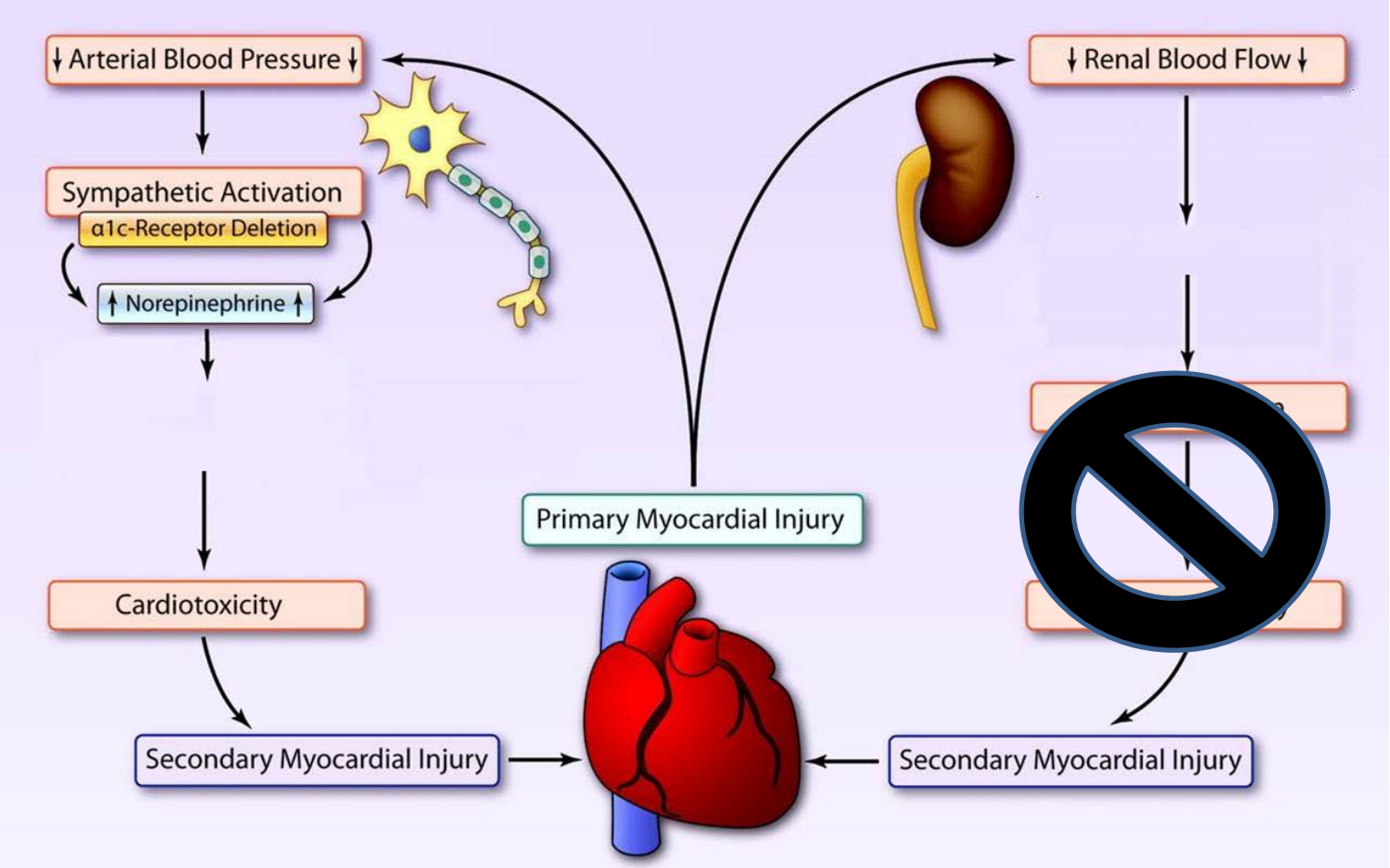
- Side Effects: fluid retention, dizziness, fatigue, hypotension
- Contraindications: decompensated HF, heart block, severe reactive airway disease

Monitoring: heart rate (<60 and symptomatic), blood pressure

Start Low & Go Slow

- May initiate simultaneously with ACEs
- Titrate first in stable patients
  - Greater benefit at target doses
- May worsen symptoms when started, gain weight
  - May happen with every dose increase
  - Resolve in 1-2 months
- Start low and go slow
- Don’t stop suddenly → Rebound effect
- Hypotension? Take beta blocker & ACE at different times of day

Aldosterone Antagonsists: How They Help



Aldosterone Antagonists

- RALES trial
  - 30% reduction in all cause mortality
  - Reduced risk of sudden cardiac death & hospitalizations
- Appropriate patients
  - In addition to ACE/ARB + Beta Blocker
  - Serum creatinine < 2.5mg/dL; eGFR > 30ml/min
  - Potassium < 5 mEq/L

Generic	Brand
Spironolactone	Aldactone
Eplerenone	Inspra

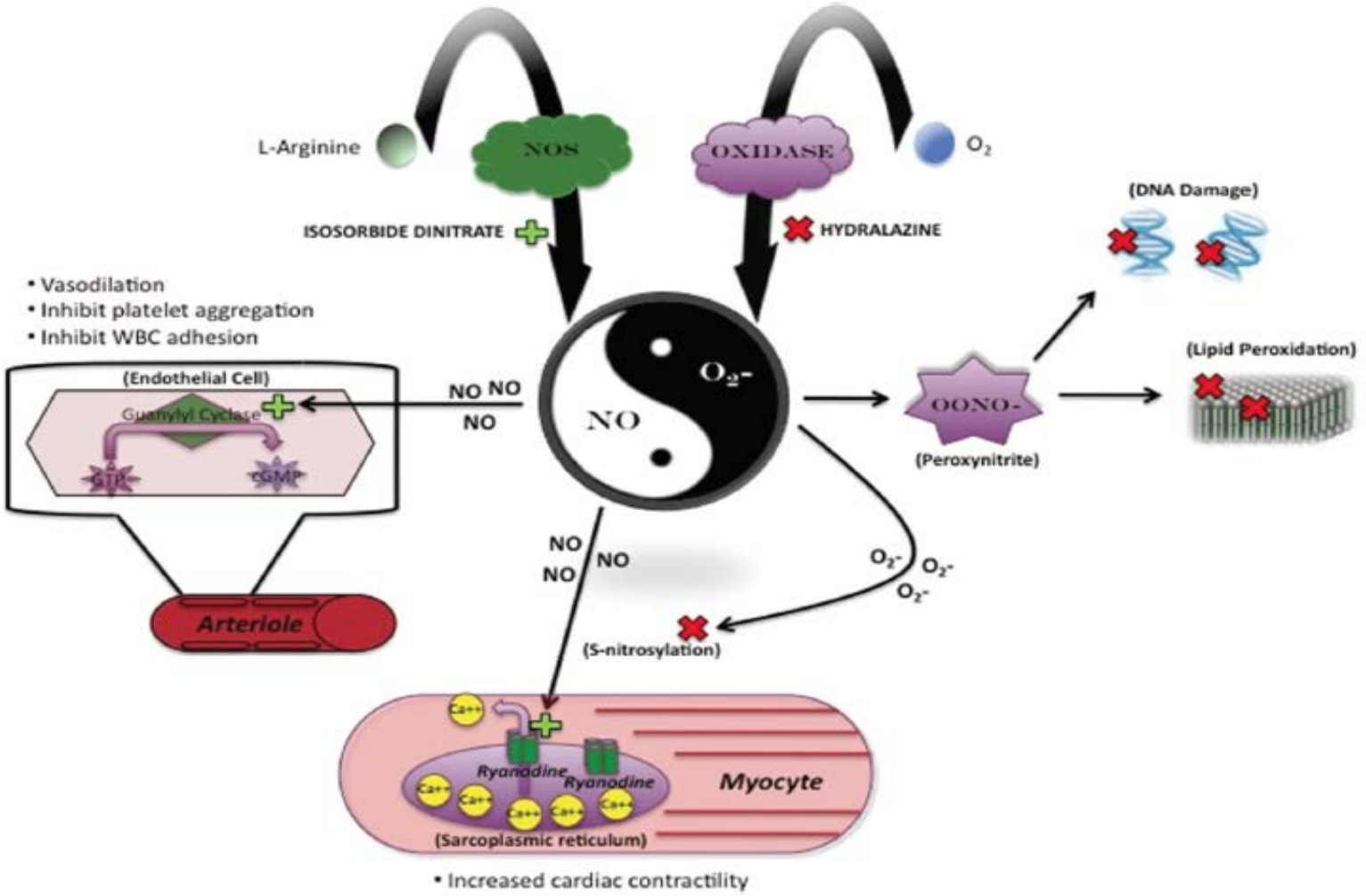
Aldosterone Antagonists Cont.

- Side Effects: gynecomastia (with spironolactone), hyperkalemia, fatigue, headache
- Contraindications: hyperkalemia, acute renal insufficiency

Monitoring: serum creatinine, potassium

- **Reduce dose if potassium > 5.5 mEq/L**
- **Consider holding if patient has vomiting/diarrhea/dehydration**

Vasodilators: How They Help



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Hydralazine + Isosorbide Dinitrate

- Significant benefit in African American patients
  - In combo with ACE/ARB + BB + Aldosterone Antagonist
  - 43% decrease in mortality risk
- High pill burden: 3-6 pills per day
  - Combo Bidil cost-prohibitive

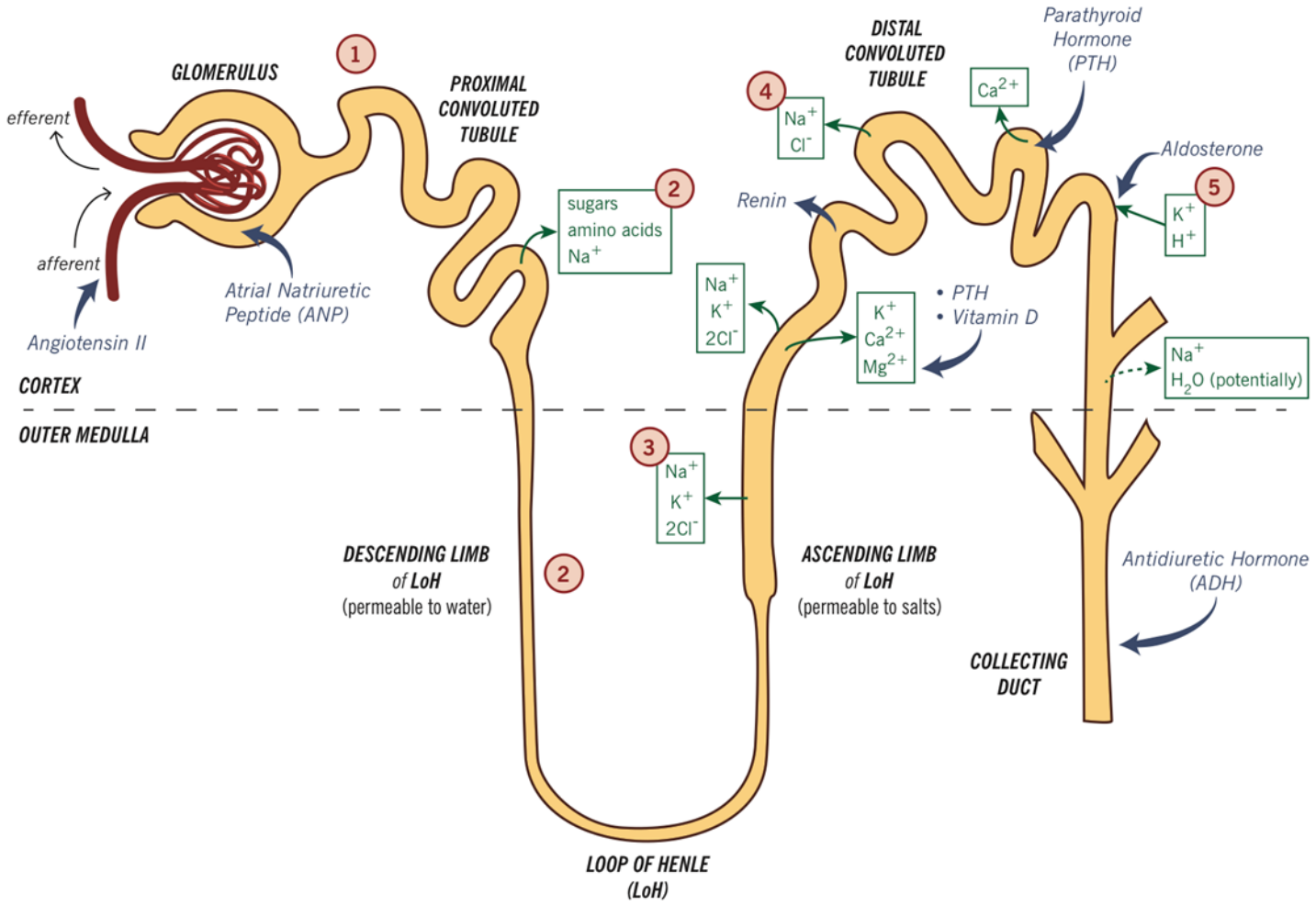
Generic	Brand
Hydralazine	Apresoline
Isosorbide Dinitrate	Isordil
Hydralazine + isosorbide dinitrate combo	Bidil

Vasodilators Cont.

- Side Effects: headache, dizziness, GI upset
- Contraindications: concurrent use with erectile dysfunction medications

Monitoring: blood pressure, CBC/Antinuclear antibody (if symptoms of lupus)

Diuretics: How They Help



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Diuretics

- Benefits: control fluid retention, improve symptoms, reduce hospitalizations
  - Unclear mortality benefit
  - Loop diuretics preferred → better fluid reduction

Loop Diuretics	
Bumetanide	**Bumex**
Furosemide	**Lasix**
Torsemide	**Demadex**

Thiazide-like Diuretic	
Metolazone	**Zaroxolyn**

Diuretics

- Take before 4pm to prevent nocturia
- Threshold and ceiling doses
- Furosemide: inter- and intrapatient variability
- Metolazone: longer half-life → electrolyte imbalances
- Side Effects: dizziness, leg cramps, photosensitivity, hypotension

Monitoring: daily weights, serum creatinine, blood urea nitrogen (BUN), potassium, magnesium

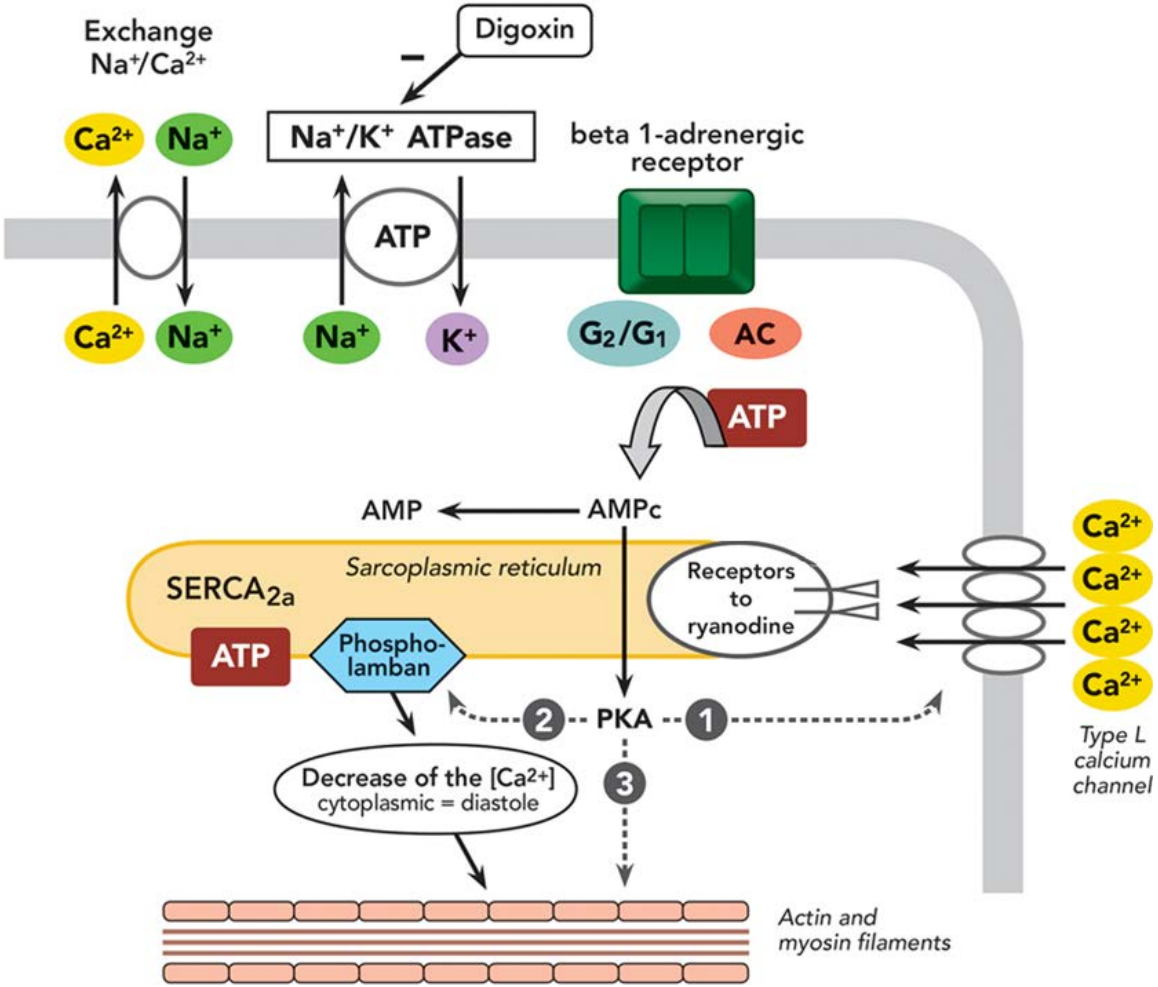
Diuretic Resistance

- Mechanisms:
  - Reduced renal perfusion
  - Increased levels of sodium-retaining hormones (angiotensin II and aldosterone)
  - Low albumin → slower delivery of drug to kidney
- Treatment approach
  - Switch to torsemide or bumetanide
  - IV diuretics
  - Add metolazone (take 30 mins before loop diuretics)

Shared Decision-Making in Diuretic Dosing

- Patients' experiences with diuretics
  - Doesn't take on Sundays when going to church
  - Doesn't take when out running errands
  - Doesn't take when going to the doctor
  - Homeless patients → limited access to restrooms
- Individualize the plan for each patient

Digoxin – How it Helps



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Digoxin

- Not a first line agent
  - For symptomatic patients on target doses of GDMT
- Benefits: improve symptoms, quality of life
  - DIG trial: no difference in mortality vs placebo, reduced hospitalizations by 28%
- Don’t stop digoxin if patient is already taking it
- Side Effects: confusion, GI upset, yellow vision
- Contraindications: heart block

New Drugs

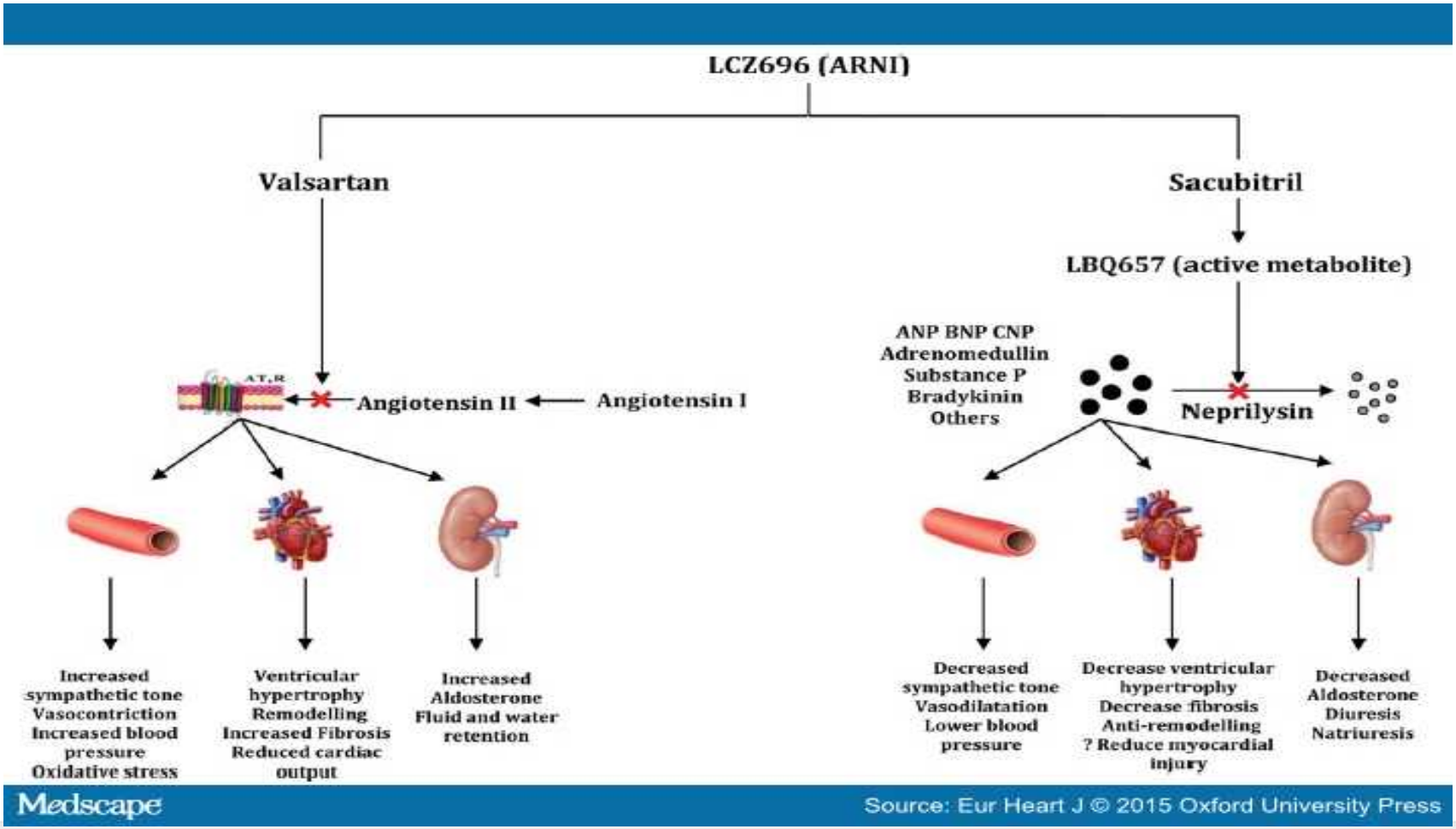
Ivabradine (Corlanor)

- FDA approved April 2015

Sacubitril & Valsartan (Entresto)

- FDA approved July 2015
- Valsartan: ARB
  New drug class ‘ARNI’

Angiotensin Receptor Neprilysin Inhibitor (ARNI): How it works



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Sacubitril & Valsartan (Entresto)

- PARADIGM-HF trial
  - 16% additional reduction in all cause mortality compared to ACEI
  - Reduced risk of cardiovascular death & hospitalizations
- Appropriate patients
  - In place of ACE/ARB, in ACE/ARB tolerant patients

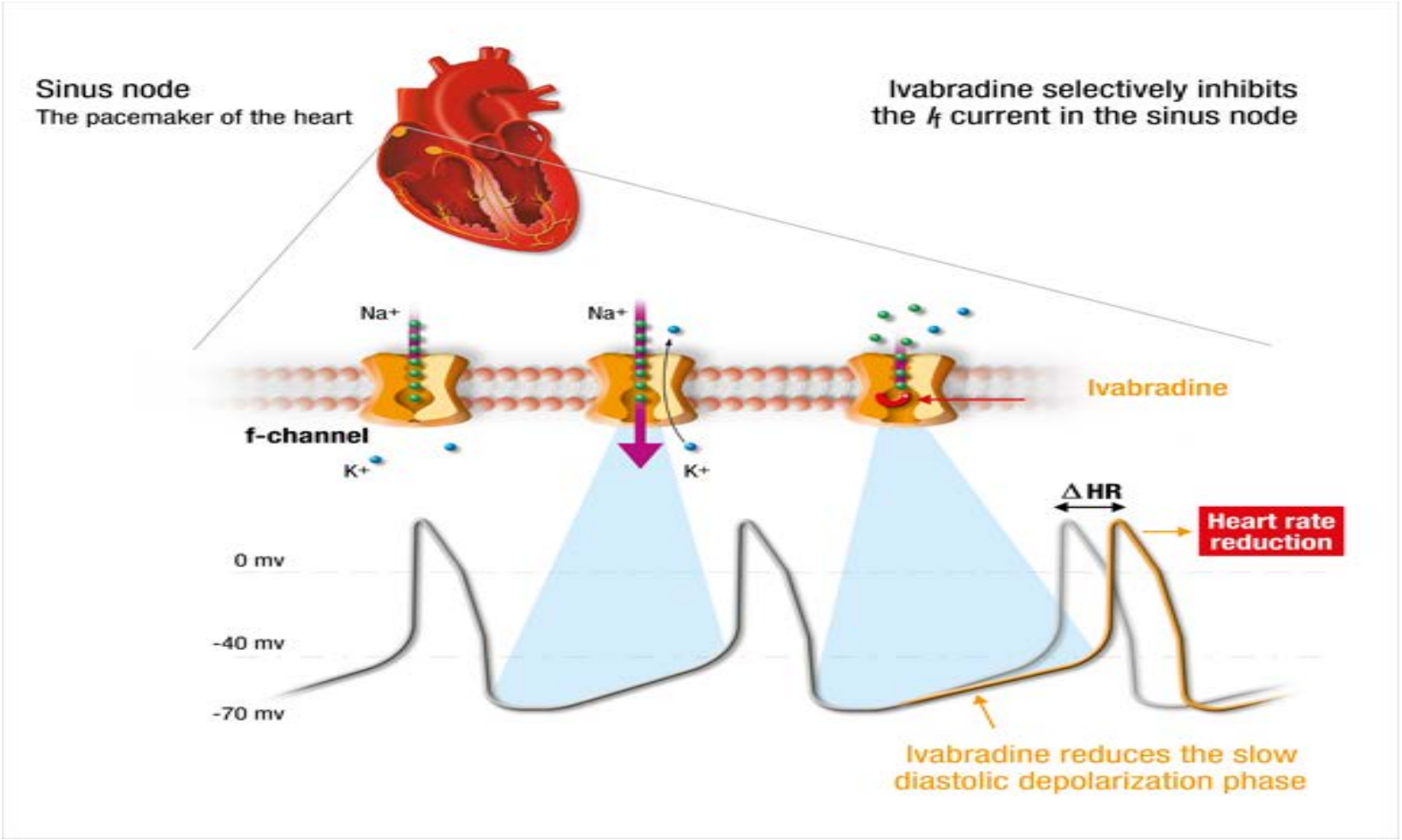
Generic	Brand
Sacubitril & Valsartan	**Entresto**

Sacubitril & Valsartan (Entresto)

- Meant to replace ACEI/ARB
- Washout period = 36 hours (Angioedema risk)
- Titrate to target dose over 2-4 weeks as tolerated
- Side Effects: hyperkalemia, hypotension, and renal dysfunction
- Contraindications: pregnancy

Monitoring: serum creatinine, blood pressure, potassium

Ivabradine: How it works



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Ivabradine

- SHIFT trial
  - Reduced risk of HF hospitalizations by 18% compared to placebo
- Appropriate patients
  - Patient on maximum tolerable doses of GDMT (especially beta blockers)
  - Stable, symptomatic and persistently elevated HR ≥ 70 bpm

Generic	Brand
Ivabradine	**Corlanor**

Ivabradine

- Target HR 50 to 60 bpm
- CYP3A4 inhibitors: diltiazem, verapamil, grapefruit juice; inducers: rifampin, phenytoin
- Side Effects: low heart rate, atrial fibrillation, increased phosphenes (visual brightness)
- Contraindications: severe hypotension, pacemaker dependent, severe liver impairment

Monitoring: blood pressure, heart rate

HFpEF

- Treat co-morbidities
  - ACEs, ARBs, beta blockers for hypertension
- Diuretics
  - Low doses
  - Monitor for hypotension
  - Long term treatment with low-mod doses
    - Furosemide 20-40mg daily

Medications To Avoid In HF

- NSAIDs → reduce diuretic effectiveness by blocking prostaglandin-mediated increase in renal blood flow
- Calcium channel blockers: nifedipine, nicardipine, isradipine, diltiazem, verapamil
  - Amlodipine is ok
- Thiazolidinediones (TZDs): pioglitazone, rosiglitazone
- Antiarrhythmia meds: i.e. quinidine, procainamide
  - Amiodarone or Dofetilide are ok
- Erectile dysfunction meds (sildenafil, etc): contraindicated with nitrates

Vitamins or Supplements?

- Overall lower priority than heart failure meds with proven morbidity/mortality benefit
- Concerns:
  - Inconsistent evidence of benefit
  - Drug interactions
  - Pill burden
- Reasonable to treat nutritional deficiencies – if provider approves!
- Omega-3 fatty acids reasonable to use
  - Though contributes to pill burden

My Easy Drug System™

Name: Mark Grace

Date:

Primary Doctor: Dr. Harry Carry

Problems:

1. ACE + ARB
2. No beta blocker
3. NSAID in heart failure

Wh

Lisino

Losart

Ibupro

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Nurse Management Makes a Difference

- Nurse-coordinated management vs. usual care for 706 heart failure patients in Europe
  - 18 month follow-up
  - More patients on target doses of ACE/ARB and beta blockers
  - Improved LVEF
  - Improved NYHA class
  - Improved quality of life (SF-36)

Take Home Points

- ACE/ARB + Beta Blocker per GDMT
- ACE inhibitor dose may be reduced
- Do not start or stop Beta Blockers abruptly
- Torsemide or bumetanide have higher bioavailability than furosemide
- Ask patients about NSAIDs use
- Monitor after any medication changes:
  - Blood pressure, heart rate
  - Serum creatinine, potassium
  - Side effects
- Close follow-up improves outcomes

Please Hold Questions – Thanks!

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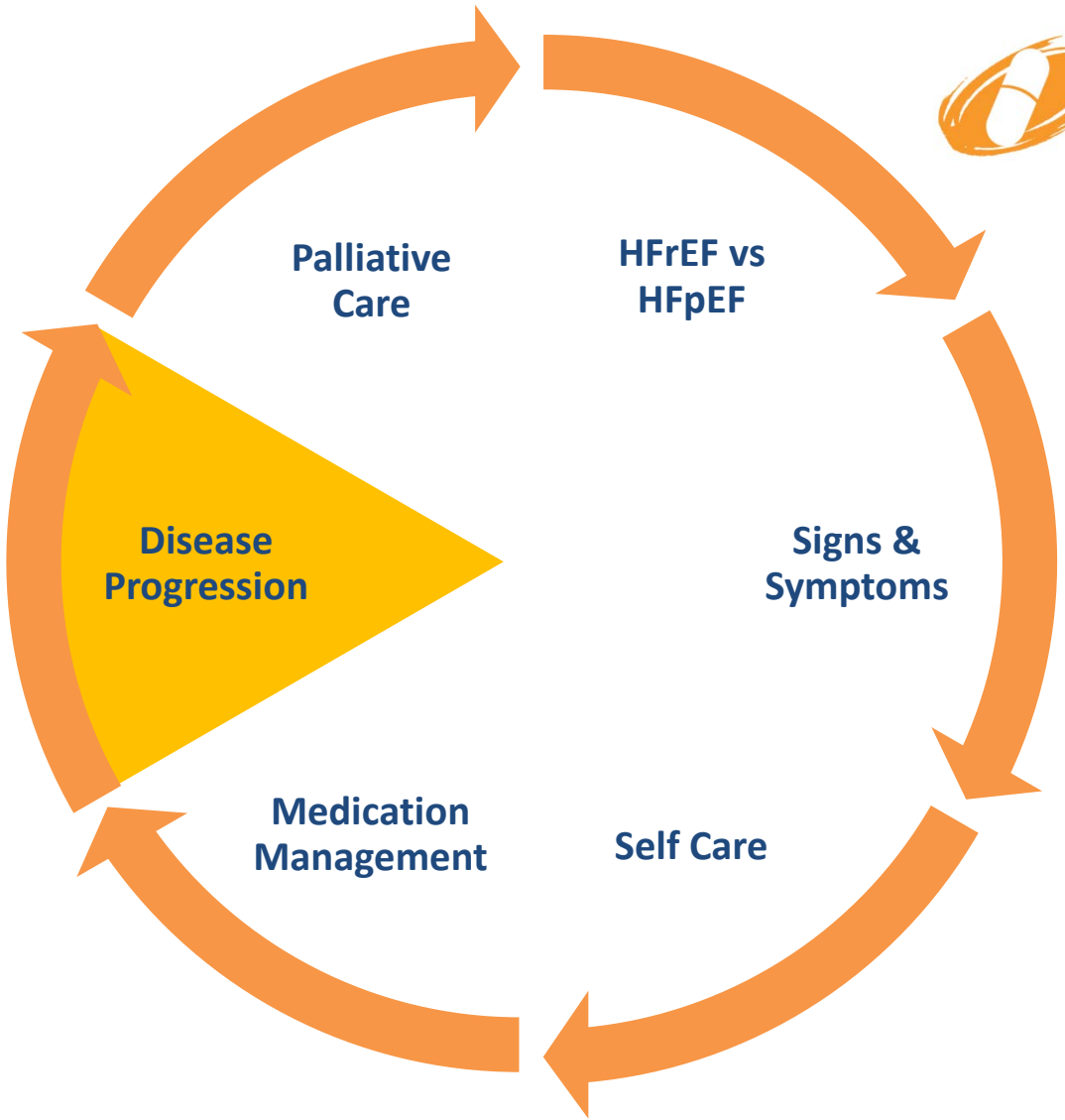
35
Br
eak


Palliative Care
HFrEF vs HFpEF
Signs & Symptoms
Self Care
Medication Management
Disease Progression

Disease Progression

Jayne Mitchell, ANP-BC, CHFN

OHSU Heart Failure Program

Heart Failure – Stage C

- NYHA class II or III
- Echo shows some type of structural issue and patient has symptoms
- **Goals of therapy**
    - Patient education
    - Symptom relief
    - Prevent re-hospitalization
    - Prolong survival (medications first, then devices as indicated)
    - Address comorbidities

Current Heart Failure Therapies That Reduce Morbidity and Mortality

DRUGS:

- ACEIs/ARBs
- Beta Blockers
- Aldosterone receptor antagonists
- Hydralazine/nitrates (in AAs)
- Diuretics…probably

DEVICES

- BiV pacemakers
- ICDs
- LVADs

OTHER

- Cardiac Transplant

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Progression of Disease

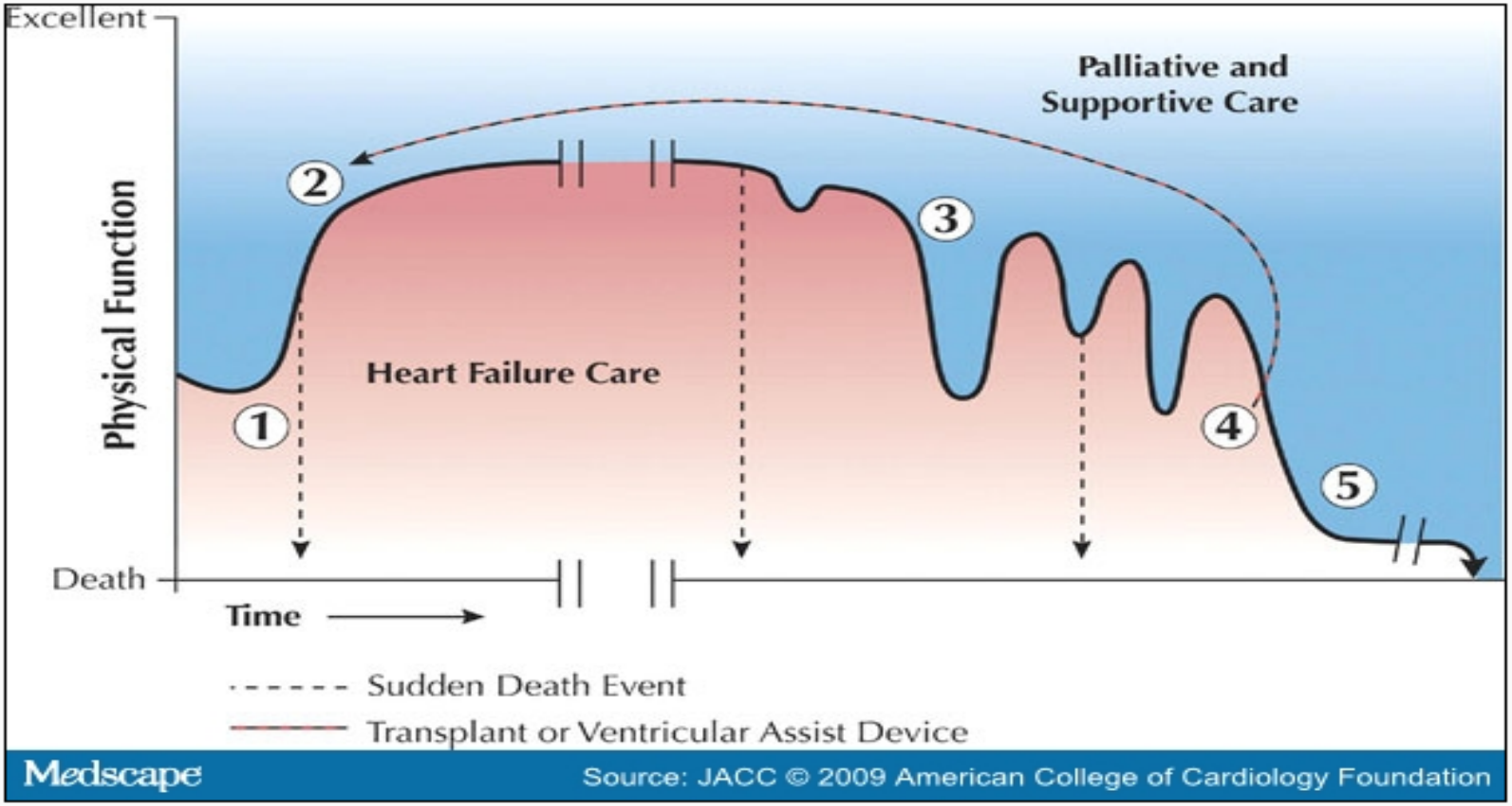

Figure 1.

Schematic Depiction of Comprehensive Heart Failure Care
Figure illustration by Rob Flewell.

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Definitions For Advanced HF

HF Association of European Society of Cardiology

- Severe HF symptoms (NYHA III/IV)
- Episodes of volume overload and/or low resting CO
- Objective evidence of myocardial dysfunction
  - Echo, cath, BNP/NT – proBNP
- Poor objective functional capacity
  - Inability to exercise
  - 6 MWT < 300m
  - Peak V02 < 12 – 14 cc/kg/min
- More than one HF hospitalization in past 6 months
- Persistence of above despite optimal medical and device therapy

Metra, M et al. EJHF 2007

Advanced Heart Failure

When to Worry

- Recurrent hospitalizations
- CRT nonresponders
- Persistence of third heart sound on exam
- Inability to tolerate ACEs/ARBs and/or beta blockers
- Renal insufficiency is present, e.g. Cardiorenal syndrome
- Poor or worsening functional capacity
- RV dysfunction is present
- High BNP levels
- Recurrent ventricular arrhythmias
- “Diastolic HF” in absence of hypertension

(It won’t get better with time)

Heart Failure – Stage D

- NYHA class IIIb or IV for greater than 45 out of 60 days
- Recurrent hospitalizations
- Does not respond to optimal therapy

**One year mortality may be as high as 30-50%

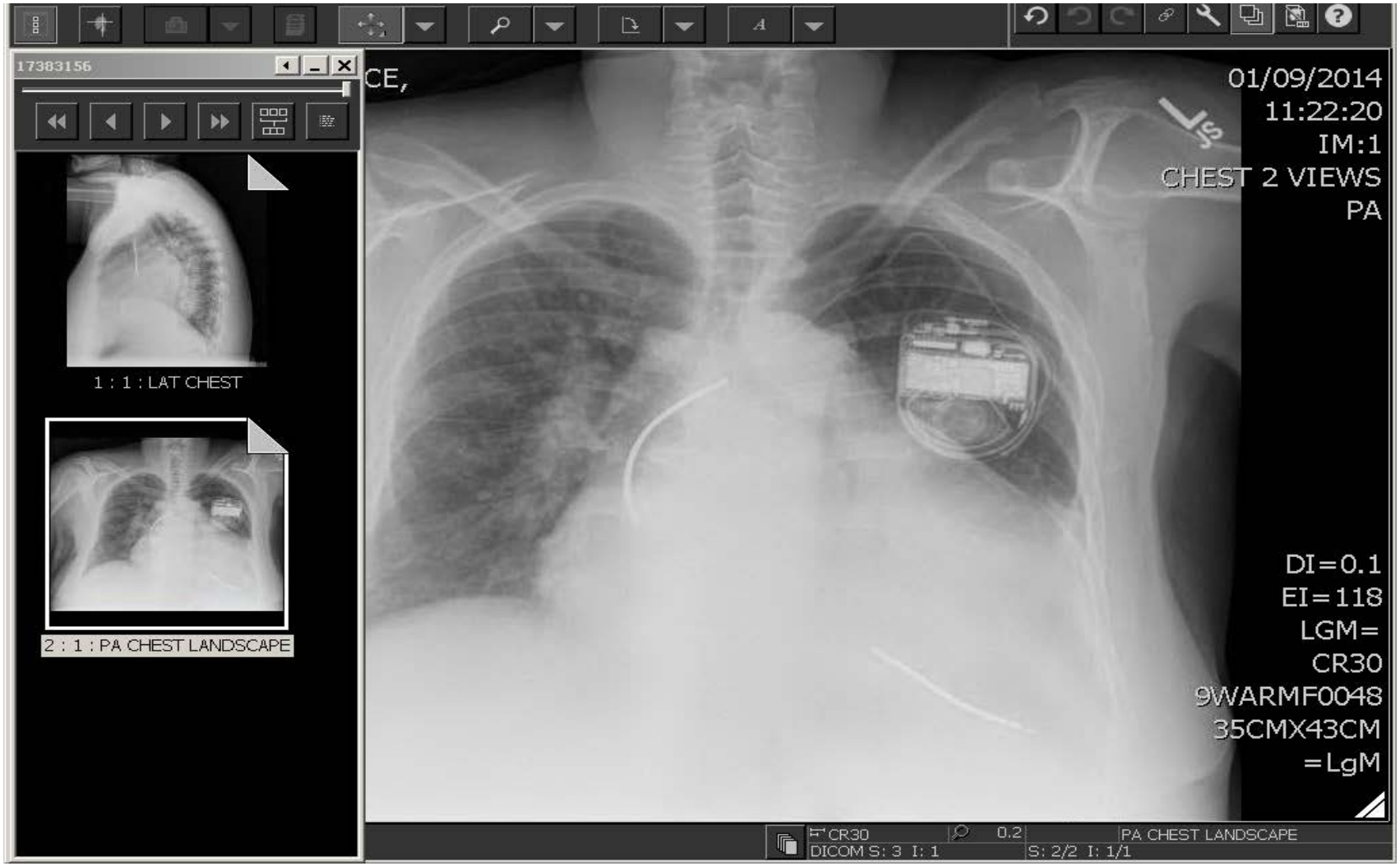
- Goals of therapy
    - Symptom relief
    - Prevent re-hospitalization
    - Prolong survival- are advance therapies indicated?
    - Improve quality of life as end of life approaches

Case Study – Ms. J Fast Forward

49 year old female comes to office for follow up

- Severe biventricular dysfunction (NICM, LVEF 20%, severe TR, moderate MR)
- History of VT arrest s/p single chamber AICD: Stage D, NYHA IIIb.
- Non-ischemic
  - Significant right sided heart failure with TR
  - Pulmonary HTN
  - RV enlargement and dysfunction.
- S/p single chamber AICD

Case Study – CXR



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Case Study – Echo

Height: 66.0 in
Weight: 211.0 lb
BSA: 2.05 m²
Blood Pressure: 122/83 mm/Hg
Gender: F
Order: 103602447

Sonographer: Tom Mortemore RCS
Referring Provider: EMILY MYERS
Patient Location: 5a
Modalities Performed: 2D, Color Doppler, Spectral Doppler and Optison contrast.
Study Quality: This was a technically difficult study, but image quality improved with echo contrast.
Imaging Limitations: Patient size and body habitus.
Exam Indication: CHF, Concern for pericardial effusion

Transthoracic Echocardiographic Report

Final Impressions:

1. The left ventricular cavity size is severely increased.
2. The LV systolic function is severely decreased.
3. Visually estimated left ventricular ejection fraction is 20 - 25%.
4. Severely enlarged right ventricle.
5. Moderately reduced RV systolic function.
6. Moderate mitral valve regurgitation.
7. Severe tricuspid regurgitation.
8. There is complete lack of coaptation of the tricuspid leaflets due to ventricular and annular enlargement.
9. Small pericardial effusion.
10. Compared to the most recent exam dated,10/14/13,there are no significant changes.
11. Moderately dilated right atrium.

2D Measurments

	2D	NL Values
LVIDd(d)	6.90 cm	(3.5-5.7cm)
LVIDs(s)	6.45 cm	
IVS(d)	0.98 cm	(0.6-1.1cm)
LVPW(d)	1.45 cm	(0.6-1.1cm)
Ao(d)	2.80 cm	(2.1-3.5cm)
LA A/Ps 2D	5.34 cm	(2.7-3.9cm)
LA area 4c	31.2 cm²	
LA vol	129.8 ml	(40-73ml)
LA vol index	63 ml/m²	(16-28)
Biplane EF	21.5 %	

Evaluation of chamber size and geometry is accomplished throug

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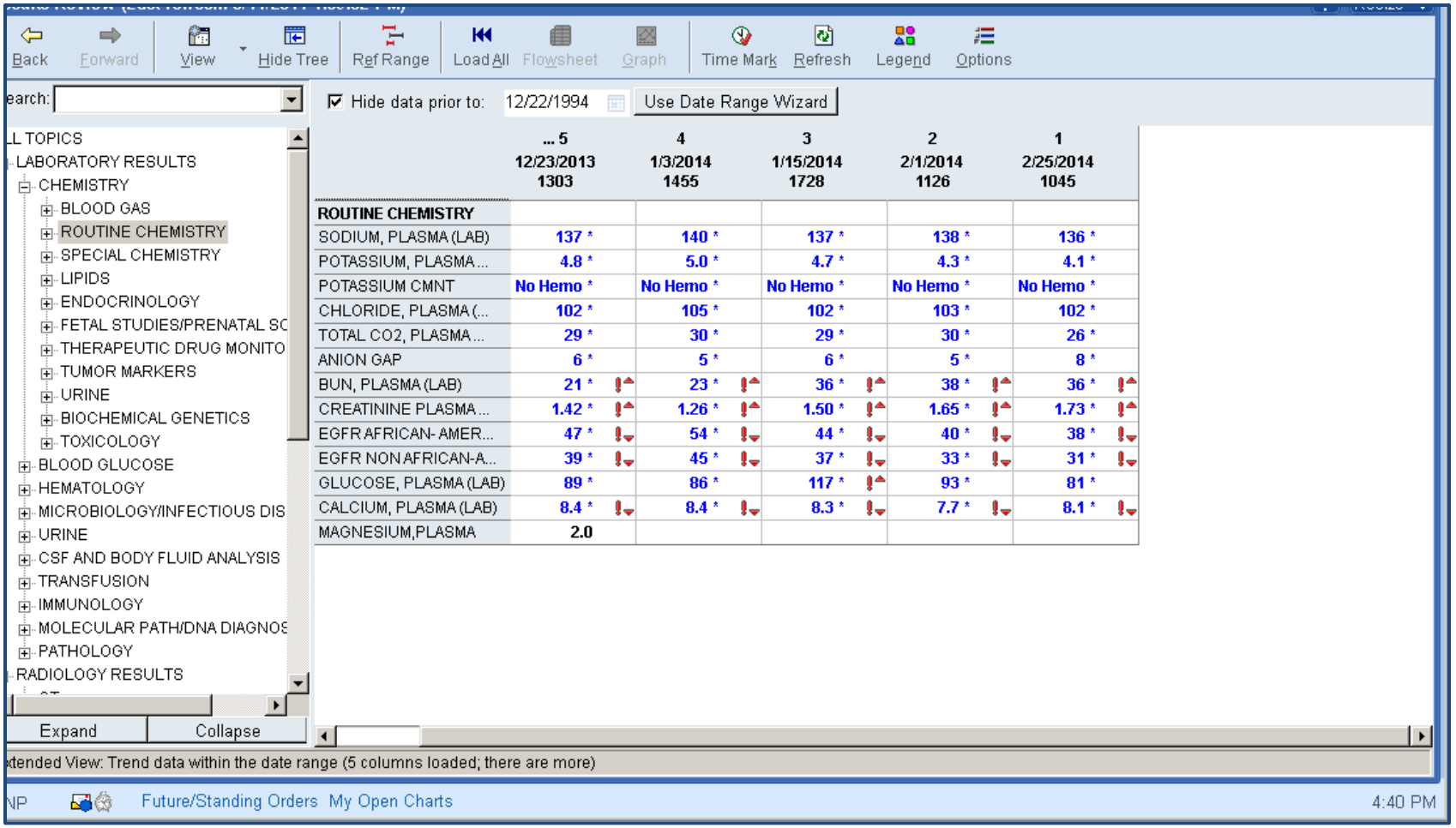
Case Study – Lab



	...5 12/23/2013 1303	4 1/3/2014 1455	3 1/15/2014 1728	2 2/1/2014 1126	1 2/25/2014 1045
ROUTINE CHEMISTRY					
SODIUM, PLASMA (LAB)	137 *	140 *	137 *	138 *	136 *
POTASSIUM, PLASMA...	4.8 *	5.0 *	4.7 *	4.3 *	4.1 *
POTASSIUM CMNT	No Hemo *	No Hemo *	No Hemo *	No Hemo *	No Hemo *
CHLORIDE, PLASMA (...	102 *	105 *	102 *	103 *	102 *
TOTAL CO2, PLASMA ...	29 *	30 *	29 *	30 *	26 *
ANION GAP	6 *	5 *	6 *	5 *	8 *
BUN, PLASMA (LAB)	21 *	23 *	36 *	38 *	36 *
CREATININE PLASMA ...	1.42 *	1.26 *	1.50 *	1.65 *	1.73 *
EGFR AFRICAN- AMER...	47 *	54 *	44 *	40 *	38 *
EGFR NON AFRICAN-A...	39 *	45 *	37 *	33 *	31 *
GLUCOSE, PLASMA (LAB)	89 *	86 *	117 *	93 *	81 *
CALCIUM, PLASMA (LAB)	8.4 *	8.4 *	8.3 *	7.7 *	8.1 *
MAGNESIUM,PLASMA	2.0				

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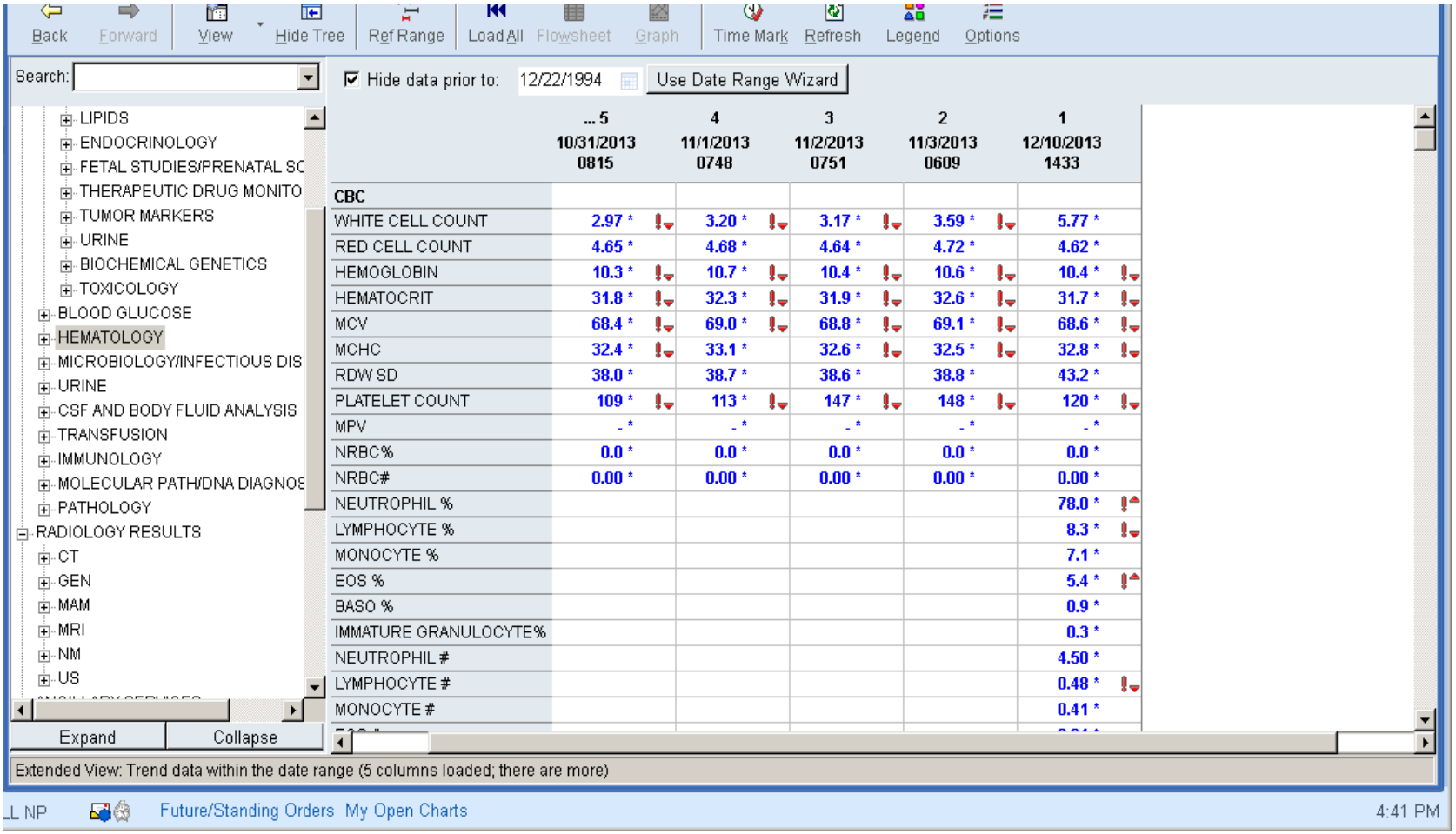
Case Study – Lab



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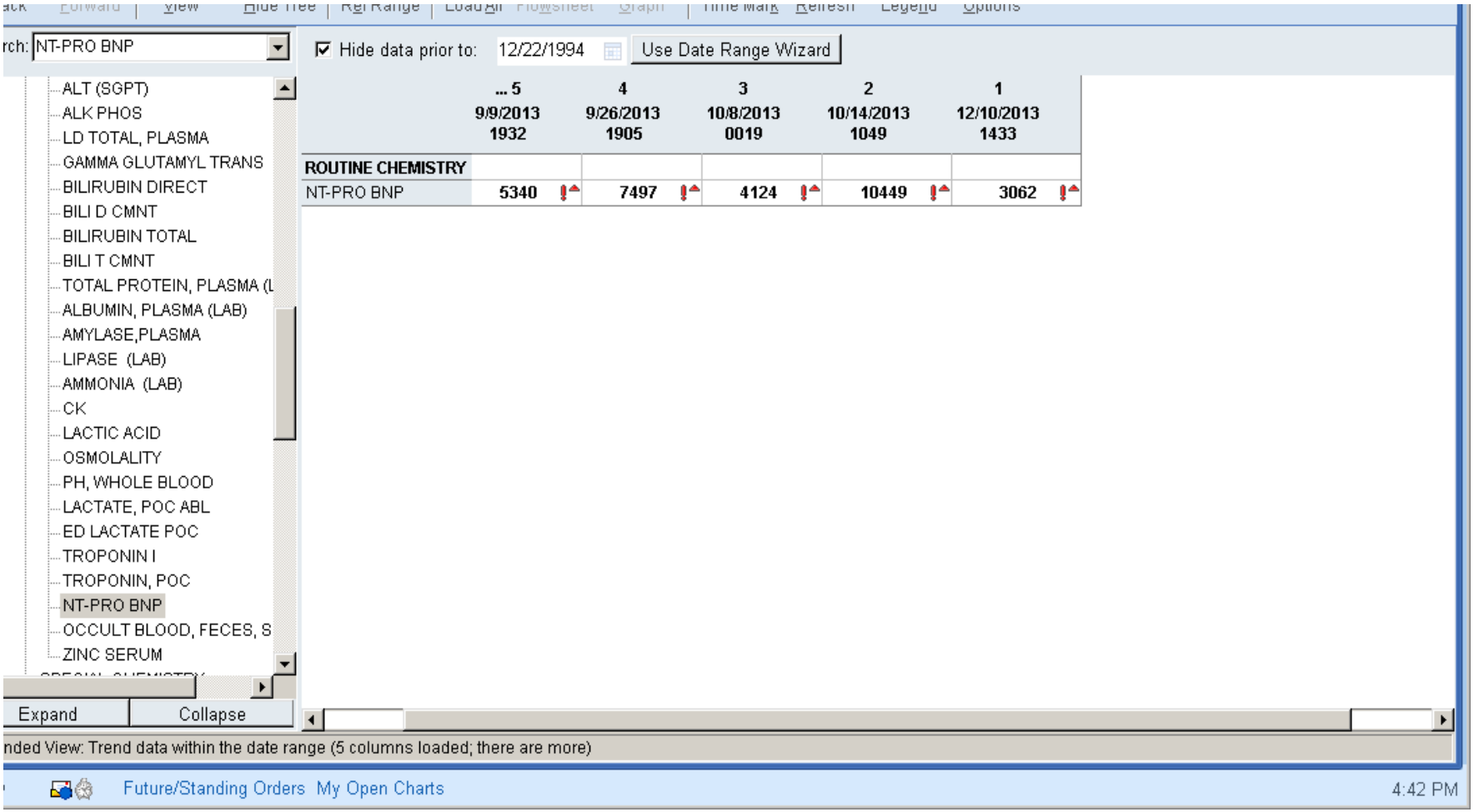
Case Study – Lab



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Case Study – Where Is She On The Curve?

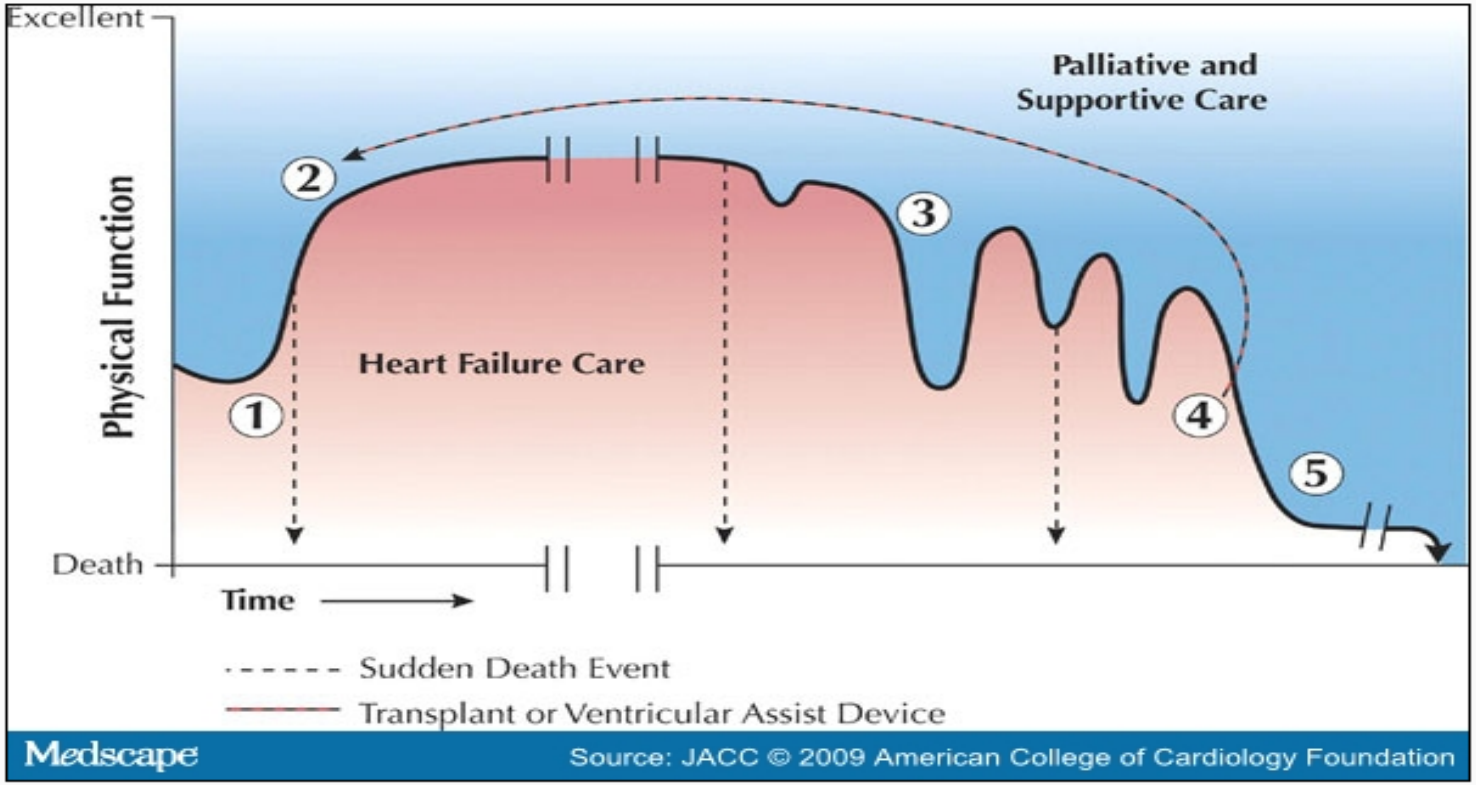

Figure 1.

Schematic Depiction of Comprehensive Heart Failure Care
Figure illustration by Rob Flewell.

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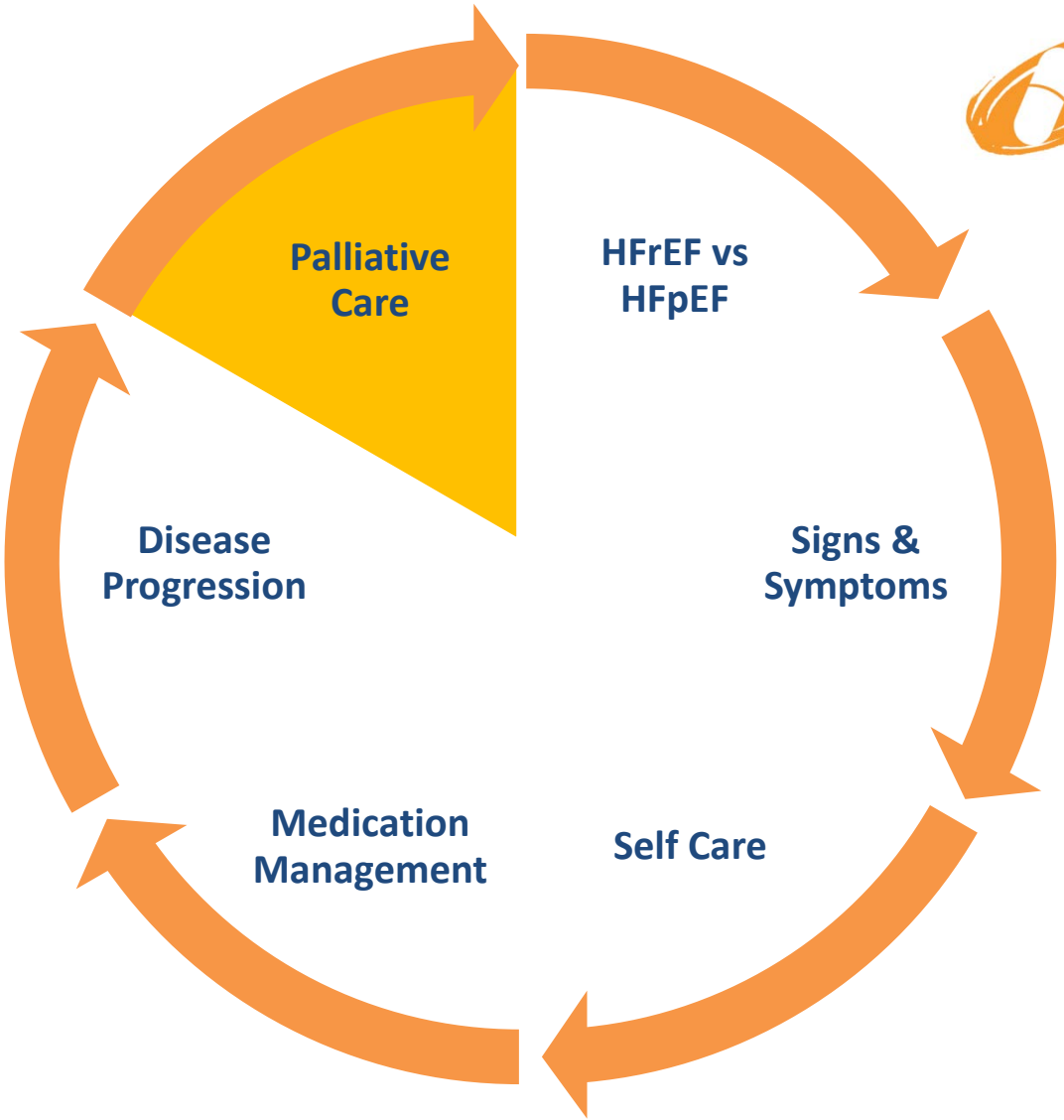
Palliative Care
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Signs & Symptoms
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Disease Progression

CareOregon Advanced Illness Care (AIC) and Palliative Care

Safety Net Palliative Care

Kelly Hayes, AIC RN

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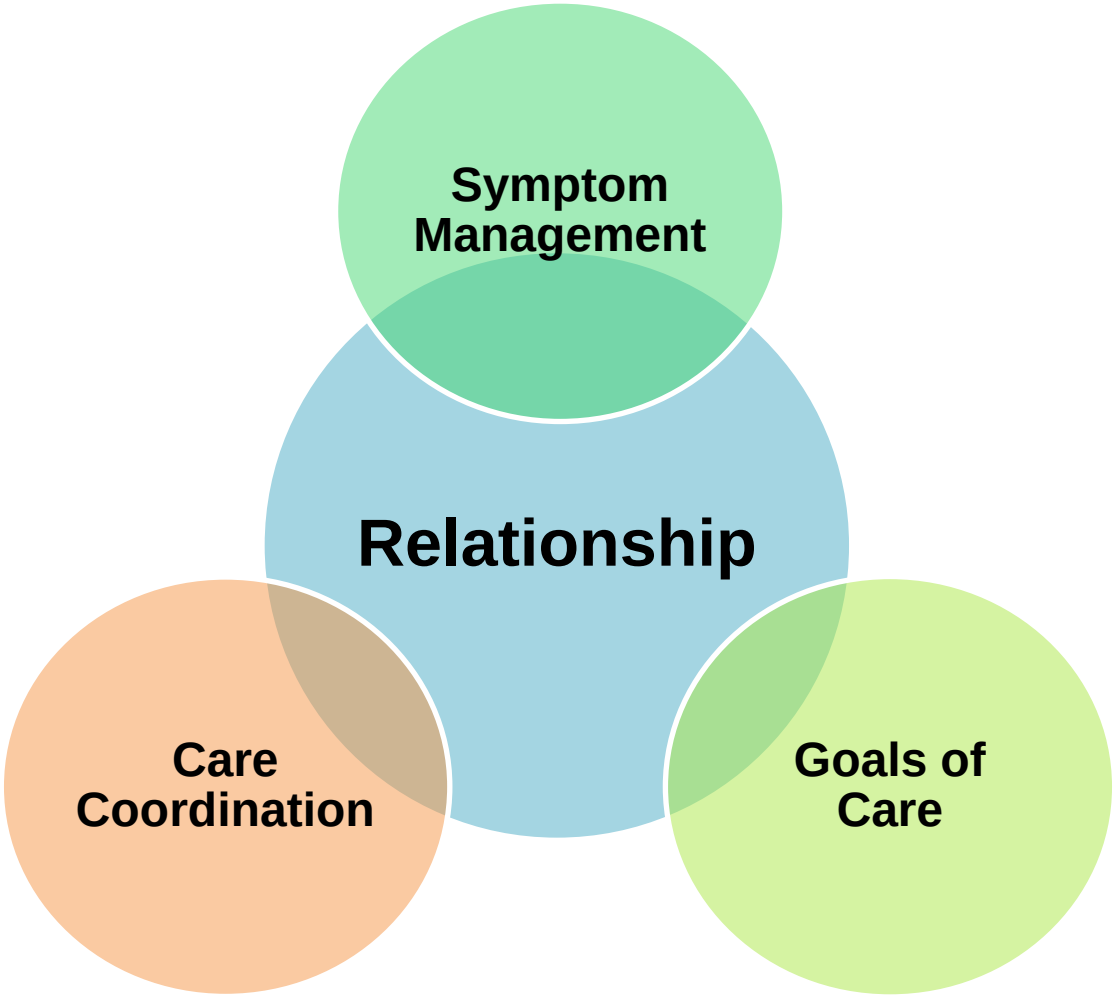
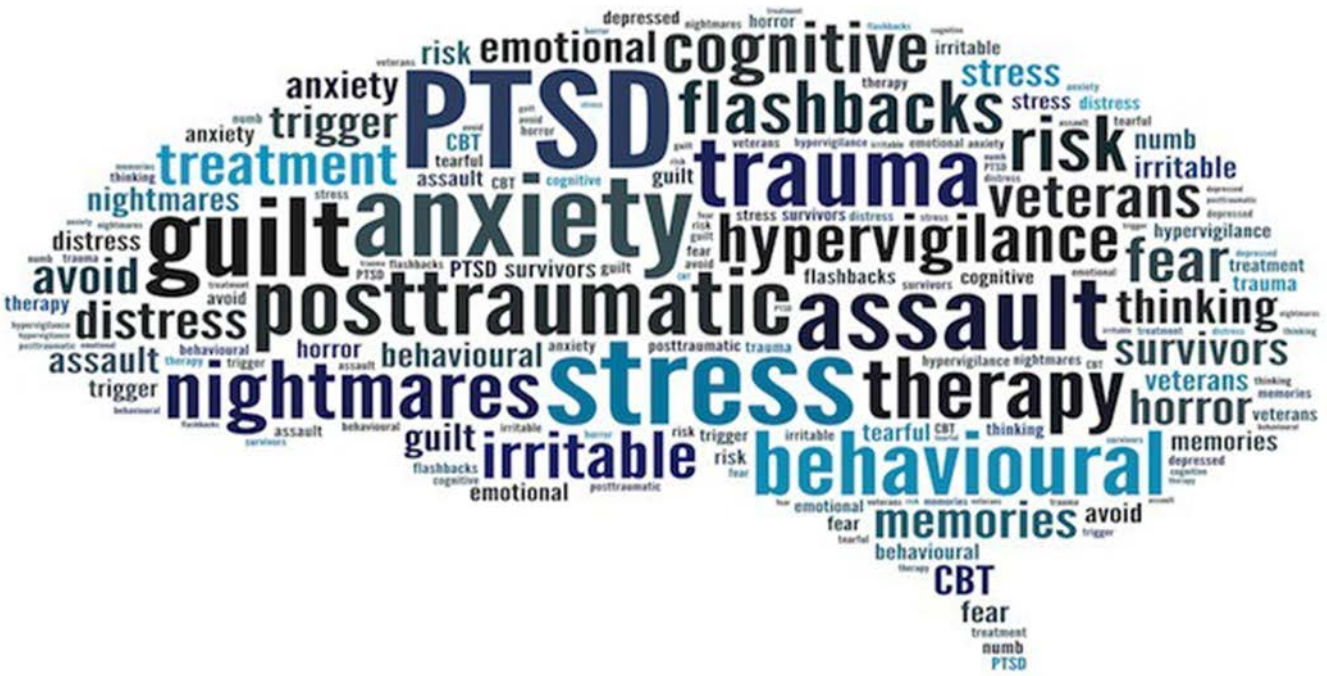
Traditional Palliative Care

Safety Net Palliative Care



Traumatic Life Experience



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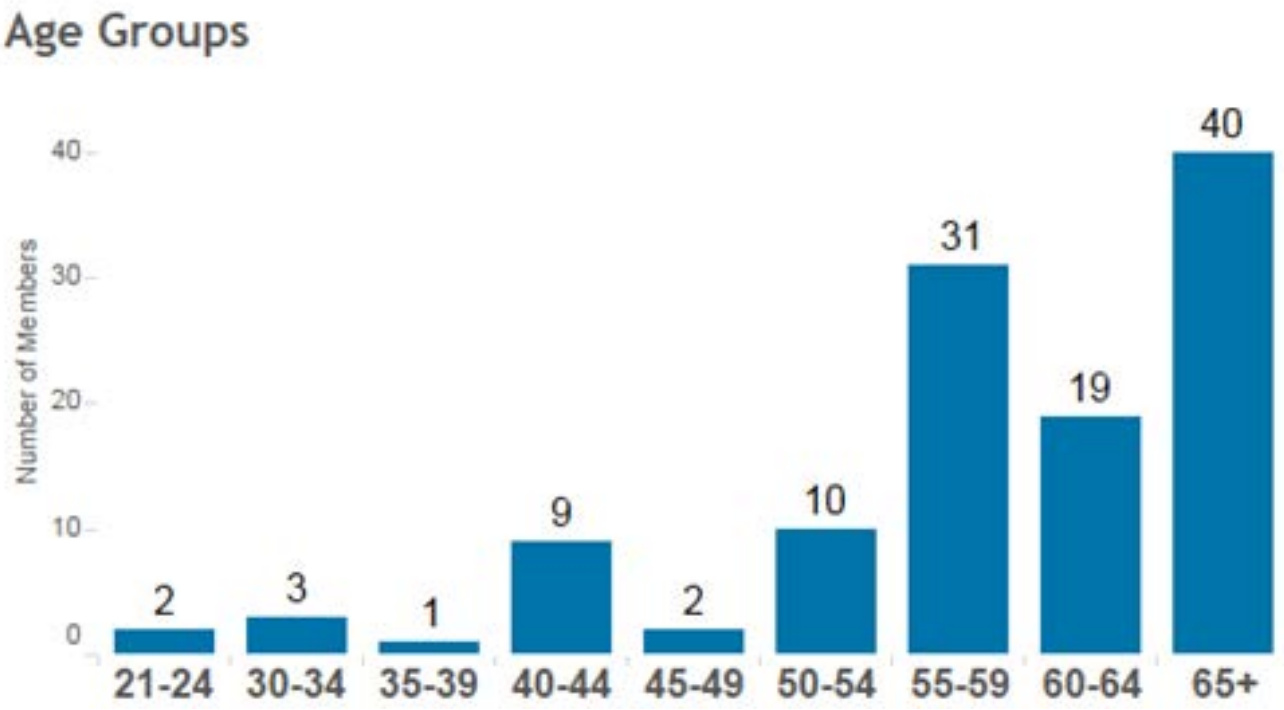
Younger Population



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> Relationships are the agents of change and the most powerful therapy is human love.
>
> — BRUCE D. PERRY, MD

All Hospice Is Palliative Care, But Not All Palliative Care Is Hospice

Palliative Care	Hospice
Would you be surprised?	Prognosis of 6 months or less
Can continue curative or aggressive treatment	Can NOT continue curative or aggressive treatment
Team: RN, MSW, HHA, Chaplain	Team: Medical Director, RN, MSW, Chaplain, HHA, Volunteer
Can receive skilled care by Home Health	Typically, cannot receive Home Health

Outpatient Palliative Care Available For CareOregon Members

With

- COA – Plus or Star
- OHP HSO/CareOregon

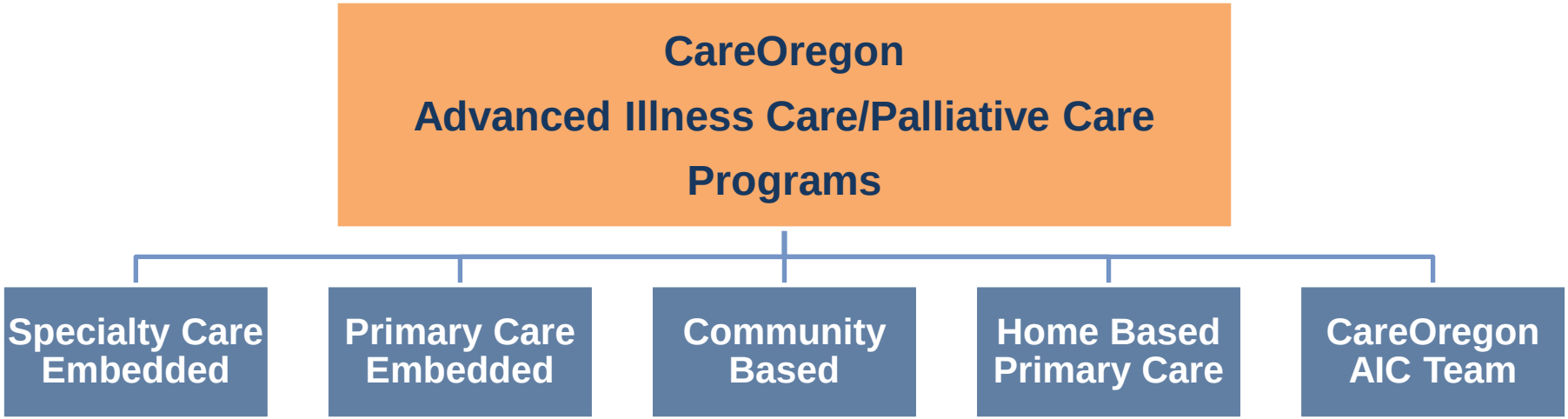
Living In

- Clackamas County
- Multnomah County
- Washington County

Suffering From

- A serious (potentially life-limiting, chronic or progressive) illness and wish to seek curative or life prolonging treatments

Five Programs/Pilots



Palliative Care Considerations

Advanced condition such as advanced cancer or heart, lung, kidney, liver, or cognitive failure with evidence of active decline

- Active decline is defined as any of the following:
  - 2 hospitalizations/or 6 ED visits in the last 12 months
  - Progressive and significant decline in one or more ADLs in the last 3 months
  - Nutritional decline: albumin <3 g/d or 5% weight loss over 6 months

Outpatient palliative care referrals

- Do not require prior authorization, but will be reviewed for appropriateness

- Referral forms are on CareOregon website http://careoregon.org/Res/Documents/Providers/Outpatient_Palliative_Care_Referral_Form.pdf

- Questions about eligibility can be directed to:
  - Julie Ellerman: 503-416-2901 or emailed to ellermanj@careoregon.org

Outpatient Palliative Care Partners

CareOregon ONLY covers palliative care services provided by:

- Adventist Health Options – 503-261-6075

- Care Partners – 503-648-9565
  - Compass Oncology Only

Additional resources

- Palliative Care: YOU ARE a BRIDGE
  - http://youtu.be/lDHhg76tMHc

- CareOregon Outpatient Palliative Care Policy
  - http://dms/allco/Policies%20%20Procedures/143%20Palliative%20Care%20PP.docx

- CareOregon Outpatient Palliative Care Referral Form
  - http://careoregon.org/Res/Documents/Providers/Outpatient_Palliative_Care_Referral_Form.pdf

Health Options Outpatient Palliative Care

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Clinical Manager OPPC
Adventist Health Homecare Services

Take Home Points

- People are complex
- The story changes- providers, family
- The setting matters- inpatient, clinic, home, appointment
- Listen to what is NOT said, as well as what is said
- Asking questions differently:
  - How are you?
  - How are feeling?

What is Palliative Care?

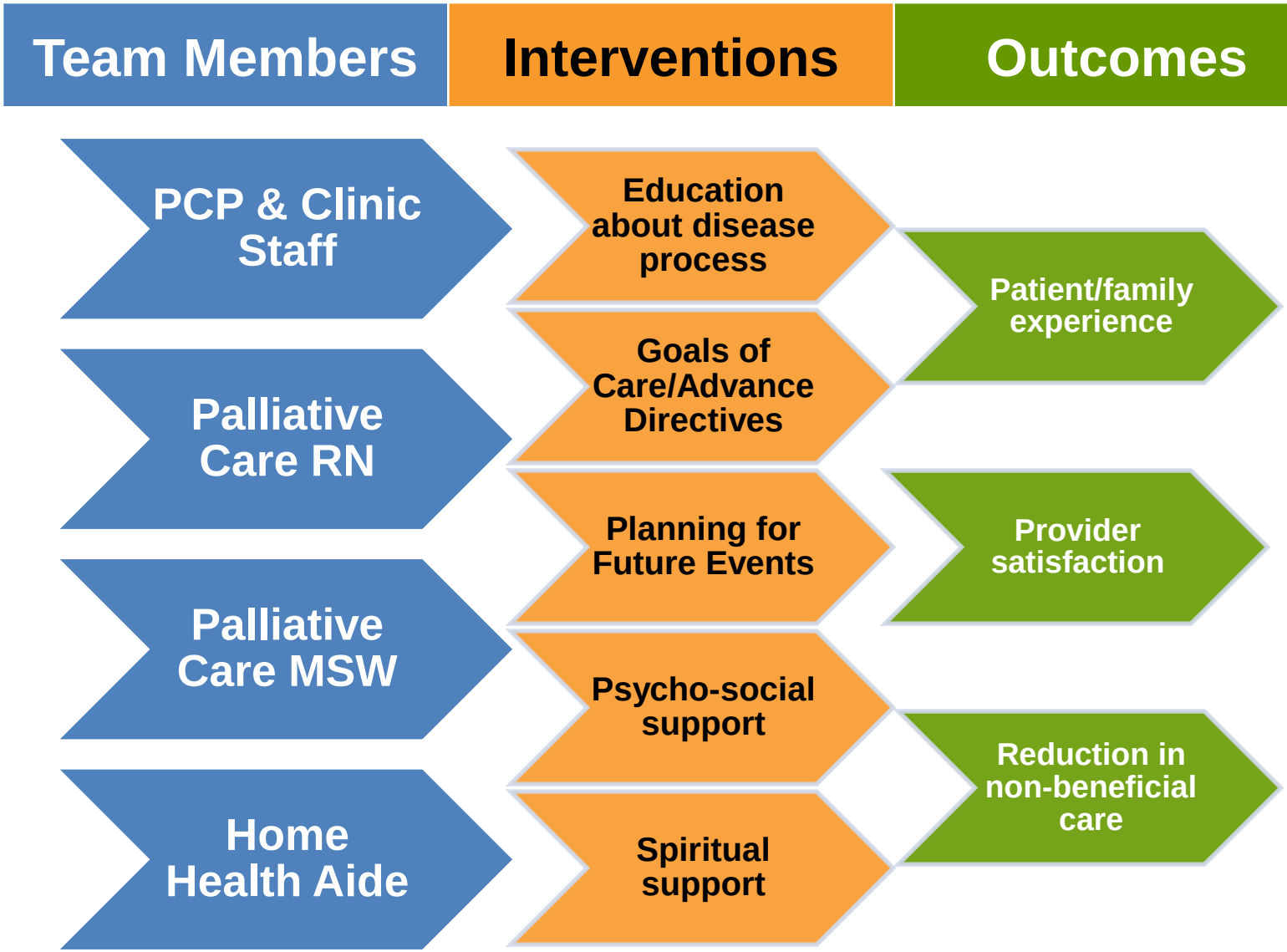
The National Consensus Project for Quality Palliative Care defined palliative care as the following:

Palliative care means patient and family-centered care that optimizes quality of life by anticipating, preventing, and treating suffering.

Palliative care throughout the continuum of illness involves addressing physical, intellectual, emotional, social, and spiritual needs and to facilitate patient autonomy, access to information, and choice.

Health Options Program Goals

- Increase patient/family understanding of disease process
- Clarify patient-centered goals of care
- Document and communicate healthcare wishes
- Collaborate with healthcare team for timely and appropriate access to care
- Facilitate appropriate transition to hospice and/or alternate level of care


Team Members
Interventions
Outcomes
PCP & Clinic Staff
Palliative Care RN
Palliative Care MSW
Home Health Aide
Education about disease process
Goals of Care/Advance Directives
Planning for Future Events
Psycho-social support
Spiritual support
Patient/family experience
Provider satisfaction
Reduction in non-beneficial care

Our Patient – Ms. J

- 51 yo female, living with adult children
- Referred July 2013, admitted November 2013
- Co-morbidities:
  - End Stage Liver Disease
  - Chronic Kidney Disease
  - Intermittent tobacco use
  - Chronic pain
  - Non-adherence to prescribed dietary changes

Health Care Team

OHSU/CareOregon

- PCP
- Cardiology- MD + ANP
- CareOregon Health Resilience Specialist

Home Care Team

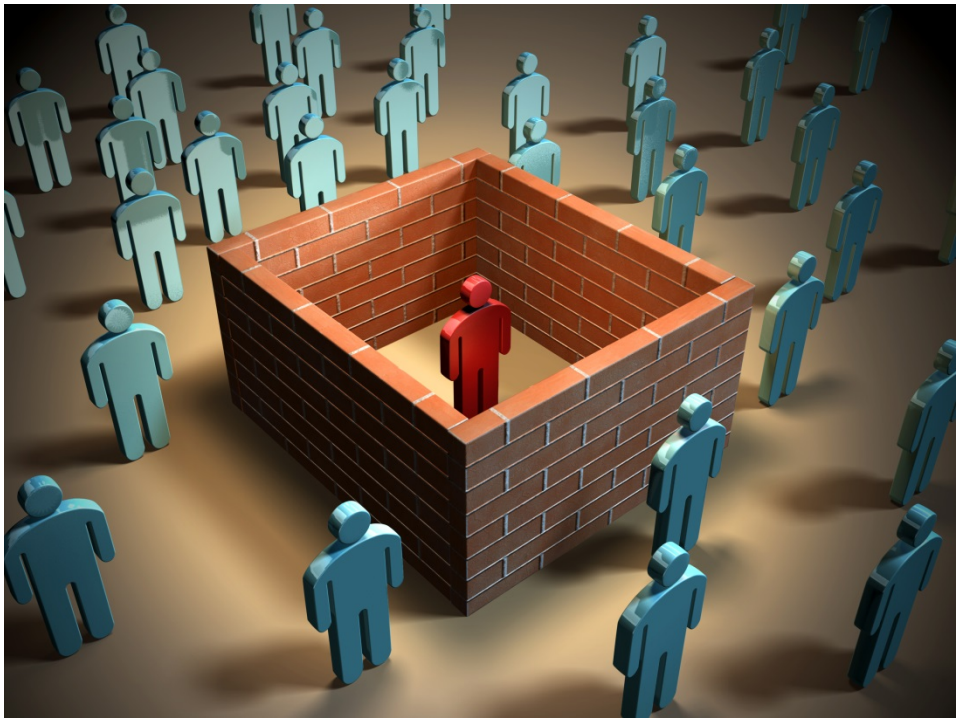
- Health Options:
  - RN
  - MSW
  - Home health aid
- Home Health:
  - PT/OT
  - Infusion RN
- Aging and Disabilities Services Case Manager

Patient Barriers To Care

- Limited phone accessibility
- Unstable home
- Inconsistent caregiving resources
- Declined home visits during symptomatic episodes
- Patient and family's priorities differed from medical team recommendations
  - Pursue all life-saving interventions
  - Patient not consistent with following recommendations from medical team

Healthcare Team Barriers To Care

- EMRs that do not communicate
- Poor inter-team communication → differing information delivered to patient and family
- Lack of systems for facilitating timely communication on hospital admission



Who is doing what?

AKA – Care Coordination

Health Options RN

- Evaluate patient/family understanding of treatment plan
- Evaluate patient/family goals of treatment- same or different?
- Collaborate with medical team to clarify pt/family understanding and expectations of outcomes of care
- Coordinate with MSW and HHA
- **Coordinate communication between inpatient and outpatient Care teams**

Health Options MSW

- Evaluate patient/family psychosocial barriers to accessing care and resources
- Coordinate caregiver support
- Advocate for patient-centered goals of care
- Educate patient/family on their role in accessing needed resources
- Provide guidance and support to patient/family:
  - Navigating system to access resources
  - Coping with changes to quality of life/health status
- **Coordinate communication between inpatient and outpatient care teams**

Ms. J's Story – Months 1 and 2

- First home visits:
  - RN – weekly
  - HHA – intermittent
  - MSW
- Caregiving and transportation established
- Admitted to hospital
- **Goals of Care Conference**
  - **Reviewed treatment options**
  - **Transplant ruled out**

Ms. J's Story – Months 3 and 4

- Patient improved with home visits and transportation to clinic visits
- Discharged from home health for meeting goals for strengthening and mobility
- Health Options RN home visits continue
- Patient admitted to PAMC ICU for general weakness with chest and abdominal pain

Ms. J's Story – Month 5

- **In-Hospital Goals of Care Conference with Medical Team, PCP, Health Options RN, and multiple family members**
  - **Patient wants all available life-saving treatments**
- Patient transferred to OHSU per her/family request to pursue all available medical treatments
- **OHSU Palliative Care Team Consultation:**
  - **Patient continues to want aggressive treatment only provided in hospital**
- Patient discharged from Health Options
- Health Options staff remained in contact with OHSU care team to discuss hospital discharge plans

Ms. J's Story – Month 6

- **Ethics Consult and Goals of Care discussion**
  - **Unable to go to SNF w/ dobutamine infusion**
  - **Patient able to discharge home with dobutamine infusion; family members providing caregiving**
- Health Options MSW onboard to coordinate care and support patient's goals of care
- Health Options RN coordinated with Home Infusion service and PCP for ongoing symptom management

Ms. J's Story – Month 7

- Ms. J expressed desire to die at home, but declined further planning or discussion
- Family members not in agreement with Ms. J's stated wishes
- **Joint visits done by Health Options RN and MSW**
  - **Assisted patient & family with goal planning**
  - **Completed Advanced Directives/POLST**
  - **Patient remained Full Code at end of discussion**

Ms. J's Story – Months 8 and 9

- Breakdown in caregiving → admitted with fluid overload after ICD fired
- Upon discharge, Ms. J remained full code, but stated her intention to stay out of the hospital
- Continued concerns around in-home caregiving
  - Noted deterioration in Ms. J's physical appearance during clinic appointments
  - Ms. J reporting more anxiety, fear of dying to provider
- Ms. J
  - Made effort to stop smoking-started using nicotine patch
  - Not tracking weight or fluid/sodium intake
  - Not willing to move to higher level of care or change code status
  - Taking several day trips, not available for home visits

Ms. J's Story – Month 10

- Admitted to Legacy Mt. Hood after driving → revealed caregiving breakdown with patient spending many hours home alone
- Patient declined to move to higher level of care
- Health Options MSW working with PCP to get Life Alert in home

Ms. J's Story – Month 11

- Ms. J reporting issues w/ nausea/vomiting, not well managed
- Ms. J progressively gaining weight with increasing abd girth and increasing shortness of breath
- Complete breakdown of in-home caregiving
- Ms. J struggling to self-manage all details of her care needs

While the above is going on:

- Ms. J expresses different wishes with health care team and family
  - Health care team → transition to hospice
  - Family → remain full code

Ms. J's Story – Month 12

- Multiple hospital and ICU admissions
  - Patient remains full code
  - Must discharge home with caregiving
- **Care Conferences with medical team and family**
  - **Family observe some signs that give them hope for patient to improve**
  - **Patient remains Full Code, remains in-hospital due to acuity of interventions and refusal to transition to Hospice**

Ms. J's Story – Month 12 Cont.

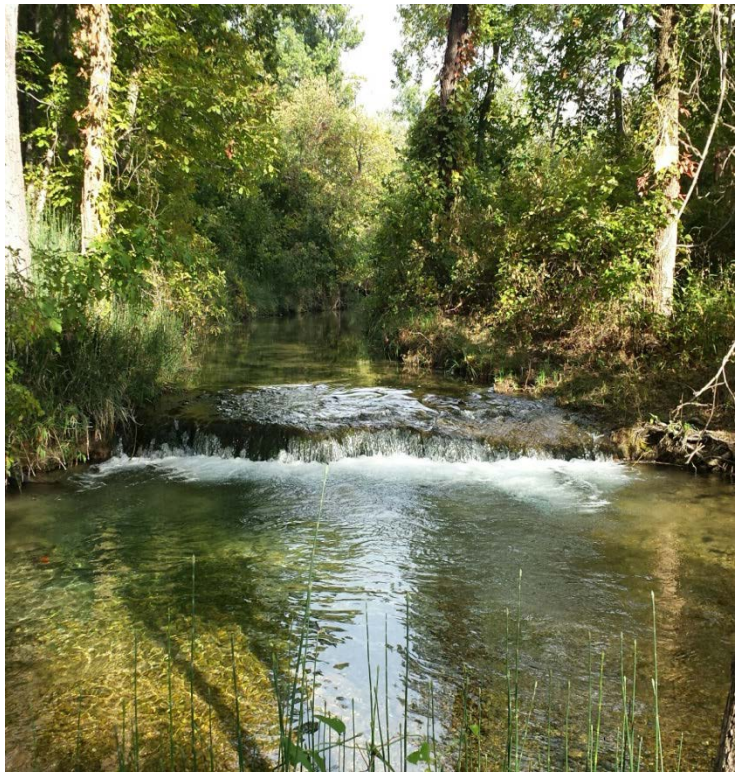
- Health Options RN and MSW communicated regularly with in-patient care team as patient continued to decline and refused transition to hospice care
- Patient coded, intubated and taken to ICU
- **Care Conference with patient's sons, who agreed to withdrawal of life support, resulting in patient death**

Ms. J's Care

- In the 12 months that MBJ was connected with Health Options:
  - 6 case conferences
  - 2 team meetings
  - 1 Ethics Consultation
  - 180 touches by OPPC team
- Ms. J was able to be home from May-Oct as Health Options was able to help coordinate services and care needed for dobutamine infusion
- Ms. J received patient-centered care with interventions driven by her desired Goals of Care

How Did Health Options Impact Care?

- Clarification of home situation and resources available
- Understanding of how home situation was impacting her immediate health status and decision making
- Continued education and clarification of expectations with patient and family, while coordinating with primary medical team
- Streamlining and clarifying inter-team communication
- While the final outcome was not “ideal” from perspective of medical team, it was in line with patient’s stated wishes for care



Take Home Points

- Family dynamics
- Not linear
- “It’s messy”
- Takes a village – not just one provider

Questions?

Thank you!