The background features a dark blue gradient with faint, light blue circular patterns and a scale on the left side. The scale is a semi-circle with tick marks and numbers ranging from 140 to 260 in increments of 10. Several circular elements, some solid and some dashed, are scattered across the background, some containing curved lines or arrows.

# EXERCISE THERAPY AND CARDIOMYOPATHY IN THE ELDERLY CARDIAC PATIENT

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# FINANCIAL DISCLOSURES

- NONE

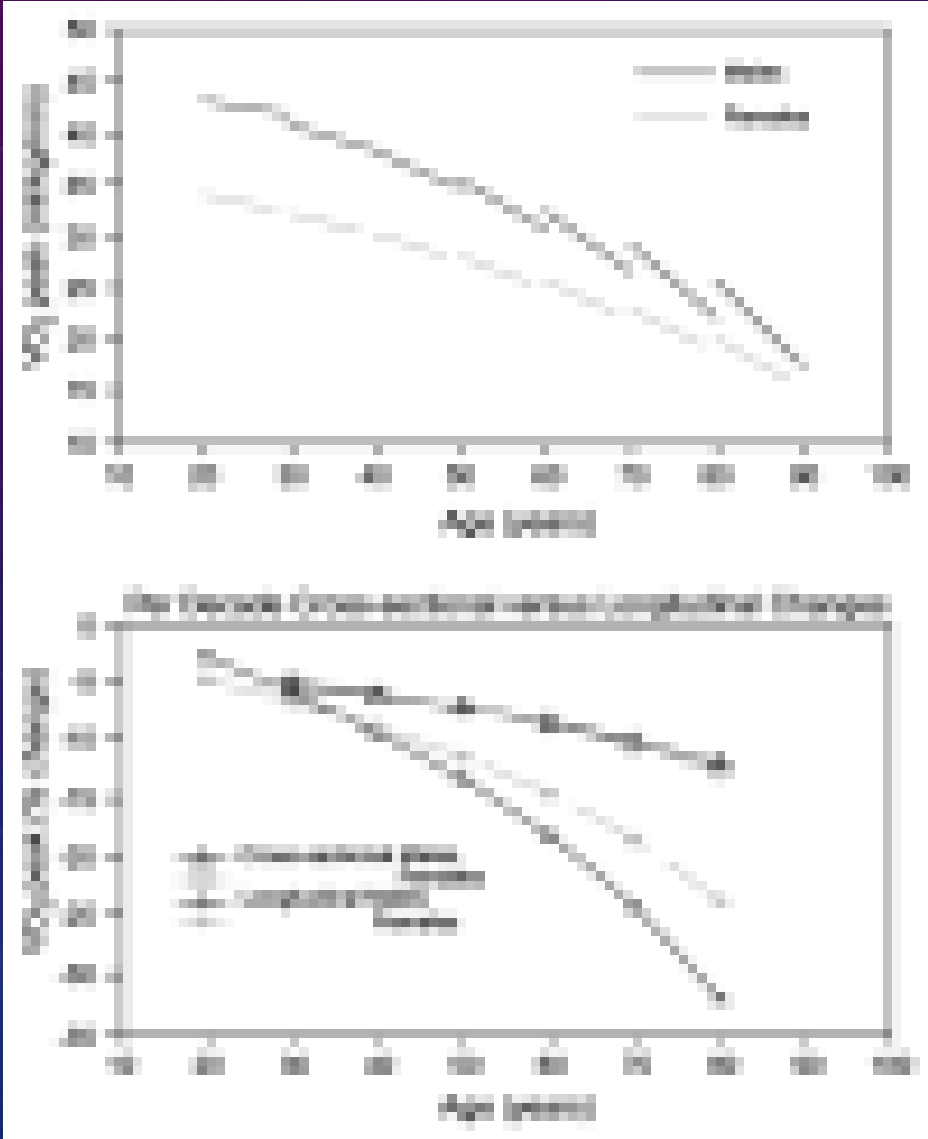
# OBJECTIVES

- Discuss the physiologic similarities between an aging heart and heart failure
- Discuss the benefits of aerobic exercise in the elderly patient with heart failure
- Discuss the benefits of resistance training in the elderly patient

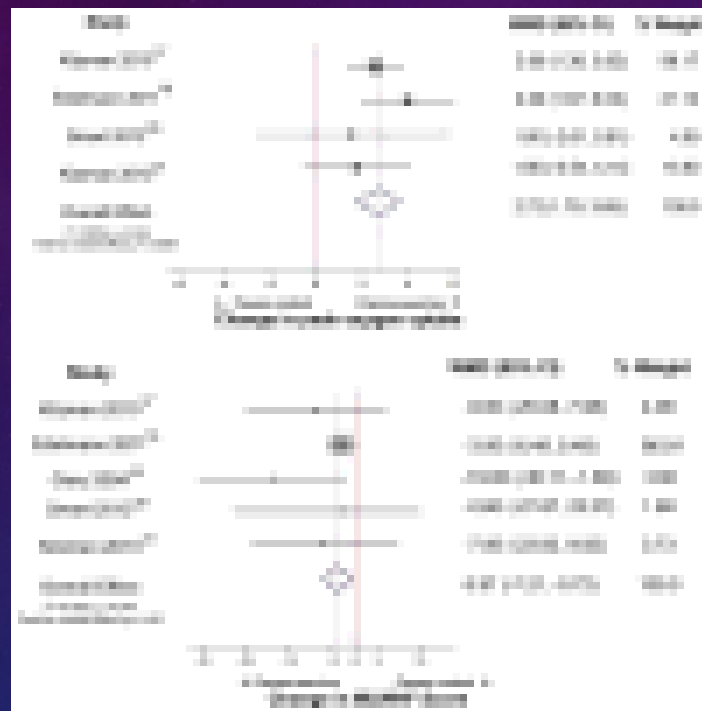
# AEROBIC CAPACITY

- Measured by  $\text{VO}_2$  (Peak oxygen consumption)
  - Product of Cardiac Output and Arteriovenous oxygen ( $\text{AVO}_2$ ) difference
- Decreases with age
  - HR decreases with age
- Decreased in heart failure
  - Decreased heart rate
  - Decreased stroke volume

# OXYGEN CONSUMPTION



# EFFECT OF EXERCISE THERAPY ON FITNESS



# DEFINITION OF HEART FAILURE

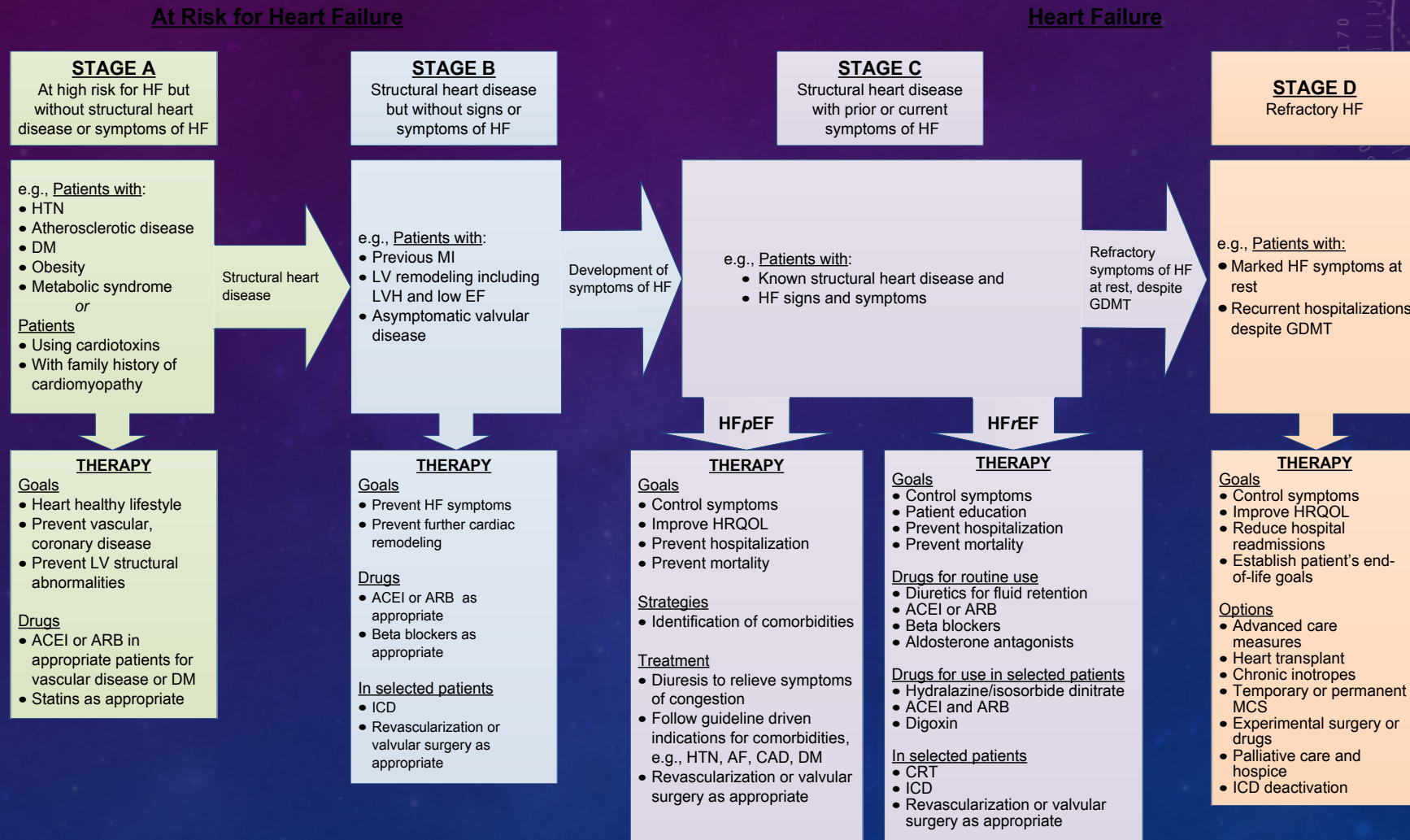
Classification	Ejection Fraction	Description
I. Heart Failure with Reduced Ejection Fraction (HF <sub>r</sub> EF)	≤40%	Also referred to as systolic HF. <b>Randomized clinical trials have mainly enrolled patients with HF<sub>r</sub>EF and it is only in these patients that efficacious therapies have been demonstrated to date.</b>
II. Heart Failure with Preserved Ejection Fraction (HF <sub>p</sub> EF)	≥50%	Also referred to as diastolic HF. Several different criteria have been used to further define HF <sub>p</sub> EF. <b>The diagnosis of HF<sub>p</sub>EF is challenging because it is largely one of excluding other potential noncardiac causes of symptoms suggestive of HF. To date, efficacious therapies have not been identified.</b>
a. HF <sub>p</sub> EF, Borderline	41% to 49%	These patients fall into a borderline or intermediate group. Their characteristics, treatment patterns, and outcomes appear similar to those of patient with HF <sub>p</sub> EF.
b. HF <sub>p</sub> EF, Improved	>40%	It has been recognized that a subset of patients with HF <sub>p</sub> EF previously had HF <sub>r</sub> EF. These patients with improvement or recovery in EF may be clinically distinct from those with persistently preserved or reduced EF. Further research is needed to better characterize these patients.

# 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.		



# ACCF/AHA 2013 HF Guidelines JAC 2013 5 June (E-Pub online)



# SIGNS AND SYMPTOMS IN HF PATIENTS

- Exercise intolerance due to fatigue and dyspnea most prominent
- Other S & S:
  - Paroxysmal nocturnal dyspnea
  - Orthopnea,
  - Edema
  - Worsening dyspnea with exertion or at rest
  - Tachycardia
  - Change in weight

# HEART FAILURE ZONES

## EVERY DAY

### EVERY DAY:

- Weigh yourself in the morning before breakfast, write it down and compare to yesterday's weight.
- Take your medicine as prescribed.
- Check for swelling in your feet, ankles, legs and stomach.
- Eat low salt food.
- Balance activity and rest periods.

Which Heart Failure Zone are you today? **GREEN**, **YELLOW** or **RED**?

## GREEN ZONE

### ALL CLEAR – This zone is your goal

Your symptoms are under control. You have:

- No shortness of breath.
- No weight gain more than 2 pounds (it may change 1 or 2 pounds some days).
- No swelling of your feet, ankles, legs or stomach.
- No chest pain.

## YELLOW ZONE

### CAUTION - This one is a warning

Call your doctor's office if:

- You have a weight gain of 2-3 pounds in 1 day or a weight gain of 5 pounds or more in 1 week.
- More shortness of breath.
- More swelling of your feet, ankles, legs, or stomach.
- Feeling more tired. No energy.
- Dry hacky cough.
- Dizziness.
- Feeling uneasy, you know something is not right.
- It is harder for you to breathe when lying down. You are needing to sleep sitting up in a chair.

## RED ZONE

### EMERGENCY

**Go to the emergency room or call 911 if you have any of the following:**

- Struggling to breathe. Unrelieved shortness of breath while sitting still.
- Have chest pain.
- Have confusion or can't think clearly.

# ROLE OF EXERCISE TRAINING IN HF

- **Current Guidelines:**
  - Class I
    - Exercise training (or regular physical activity) is recommended as safe and effective for patients with HF who are able to participate to improve functional status (Level of Evidence: A)
  - Class IIa
    - Cardiac rehabilitation can be useful in clinically stable patients with HF to improve functional capacity, exercise duration, HRQOL, and mortality. (Level of Evidence: B)

# BENEFITS WITH EXERCISE AND CARDIAC REHABILITATION

- Improvement in exercise capacity after exercise training due to peripheral adaptations (increased oxygen extraction)
- Improvement in quality of life
- Reduced hospitalizations and mortality
- Improved endothelial function
- Reduction in catecholamine levels

# RISKS TO EXERCISE

- Three major risk factors: age, presence of heart disease and intensity of exercise
  - Lowest incidence: walking, cycling and treadmill walking
  - Least active patients are higher risk
  - In HF patients, most common events include: post-exercise hypotension, atrial and ventricular arrhythmias and worsening HF symptoms

# RELATIVE CONTRAINDICATIONS TO EXERCISE IN STABLE HF PATIENTS

- Weight gain > 3 lb in 1-3 days
- Drop in systolic BP with exercise (marked/symptomatic)
- NYHA IV (can exercise selective patients)
- Complex ventricular arrhythmias
- Resting heart rate  $\geq$  100 bpm
- Pre-existing unstable co-morbidities

# ABSOLUTE CONTRAINDICATIONS TO EXERCISE WITH STABLE HF PATIENTS

- Progressive worsening of exercise intolerance (dyspnea at rest)
- Ischemia is suspected
- Severe AS or severe regurgitant valvular disease
- Acute systemic illness
- New onset afib
- Acute pericarditis/myocarditis/embolism



# EXERCISE RECOMMENDATIONS

- Aerobic activity such as walking or cycling
- Frequency – 3-5 days a week or most days
- Intensity – 55-80% heart rate reserve with perceived exertion
- Duration of each session – start at 5 minutes if needed and progress to 30-60 minutes

# EXERCISE RECOMMENDATIONS

- Cycling
  - Allows low level workloads
  - Easily reproducible
  - May be safer with orthopedic or balance problems
- Walking
- Swimming
- Yoga
- Interval training
- Flexibility and resistance training

# QUESTION #1

Exercise training improves peak oxygen consumption in an elderly patient with heart failure.

True

False

# QUESTION #1

Exercise training improves peak oxygen consumption in an elderly patient with heart failure.

**True** (correct)

False

## QUESTION #2

Resistance training does not provide any benefit to the elderly patient with heart failure.

True

False

## QUESTION #2

Resistance training does not provide any benefit to the elderly patient with heart failure.

True

**False** (correct)

QUESTIONS

???