Management of CardioMEMS Patients: A Nursing Perspective

Leslie Steinkamp, RN

Heart Failure Remote Monitoring Clinical Program Coordinator

THE GROWING PROBLEM OF HEART FAILURE

Heart failure is a serious disease with major implications in the United States.

EVERY HEART FAILURE HOSPITALIZATION INCREASES YOUR PATIENT'S RISK FOR DEATH[1]

6.2 MILLION
people have heart failure[2]

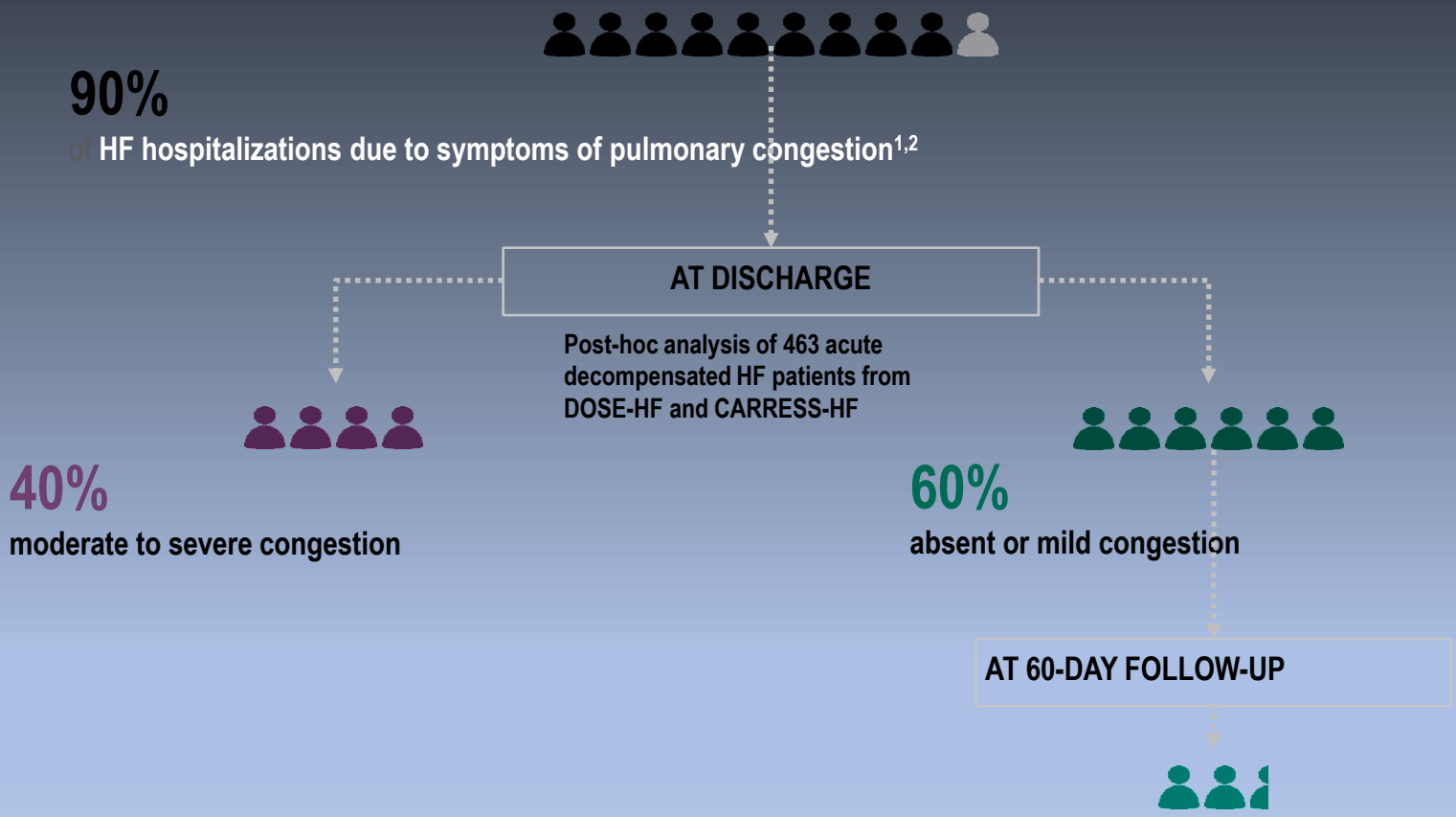
1 IN 9 DEATHS
each year from heart failure[3]

$30.7 BILLION
annual cost of heart failure[4]

1. Setoguchi S, et al. *Am Heart J*. 2007.
2. Virano SS, et al. *Circulation*. 2020.
3. Mozzafarian D, et al. *Circulation*. 2016.
4. CDC. Heart Failure Fact Sheet.

CURRENT HF MANAGEMENT:

HOW WELL DO CURRENT TOOLS KEEP PATIENTS STABLE AND OUT OF THE HOSPITAL?



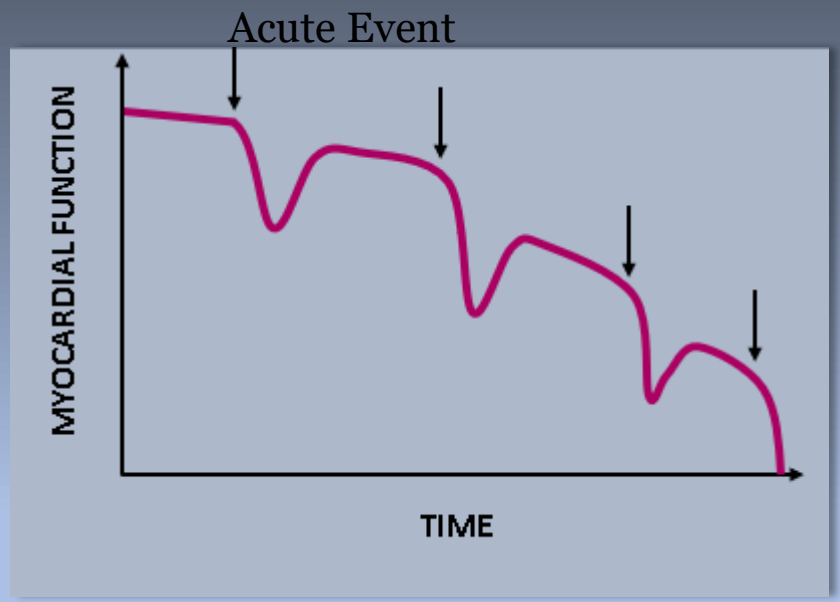
1. Adams KF, et al. Am Heart J. 2005.
2. Krum H and Abraham WT. Lancet 2009.
3. Lala A, et al. JCF 2013.

GOAL OF HEART FAILURE MANAGEMENT:

SLOW DISEASE PROGRESSION BY PREVENTING DECOMPENSATION

EACH EVENT ACCELERATES DOWNWARD SPIRAL OF MYOCARDIAL FUNCTION

With each subsequent HF-related admission, the patient leaves the hospital with a further decrease in cardiac function.



THE GOAL:
Maintain fluid volume to avoid acute decompensation and hospitalization

HF HOSPITALIZATION
is a valid endpoint for measuring decompensation

Gheorghiade MD, et al.
Am J. Cardiol, 2005.

CURRENT HF MANAGEMENT:

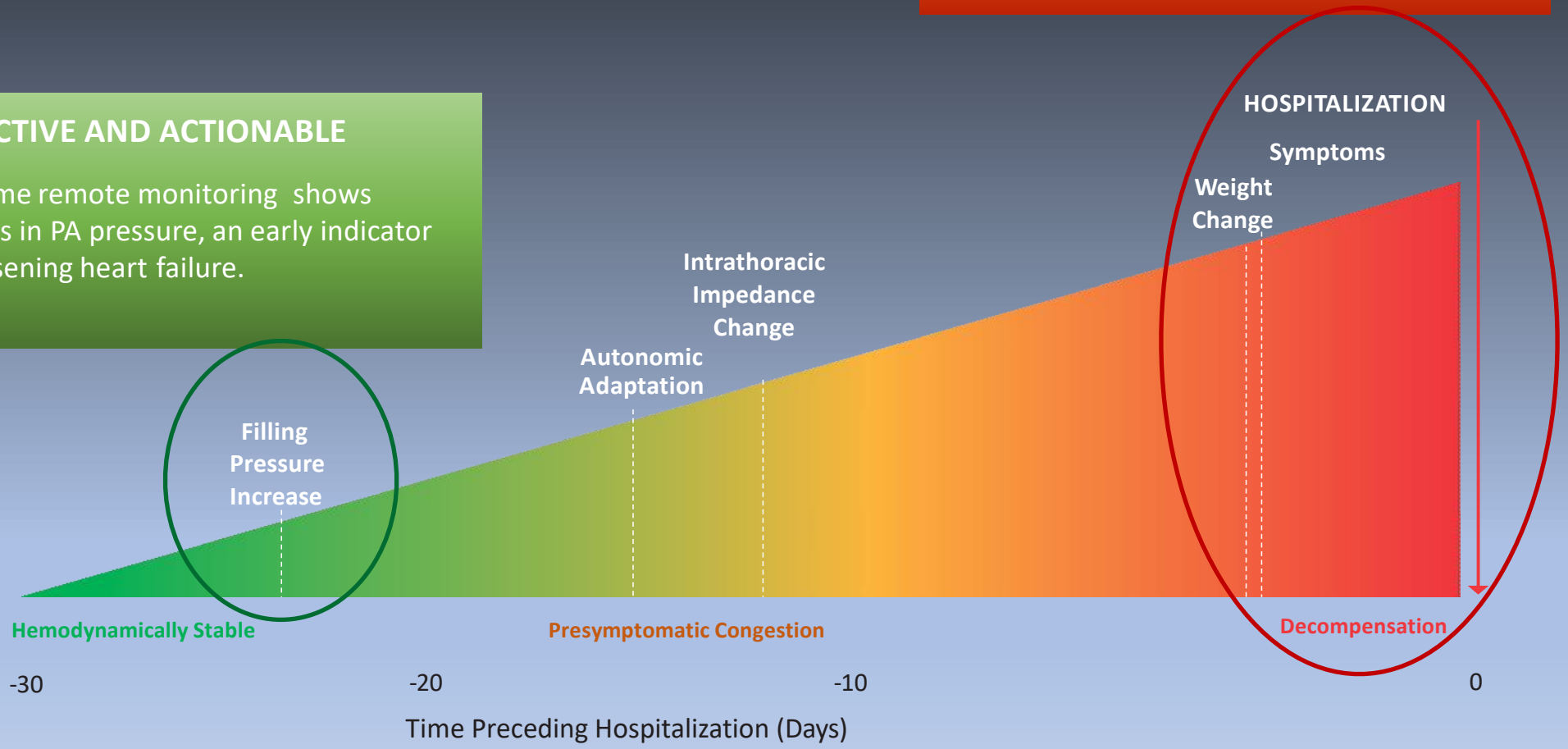
How can we get ahead of symptoms associated with acute decompensation?

REACTIVE AND INEXACT

Traditional physiologic markers, such as pt weight, symptoms, and BP occur late in the decompensation process and leave little time to react before hospitalization.

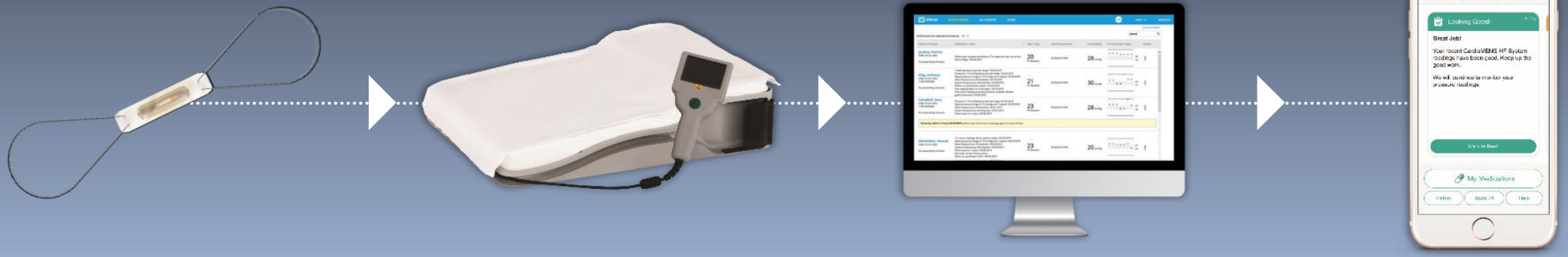
PROACTIVE AND ACTIONABLE

Real-time remote monitoring shows changes in PA pressure, an early indicator of worsening heart failure.



Graph adapted from Adamson PB. Pathophysiology of the transition from chronic compensated and acute decompensated heart failure: new insights from continuous monitoring devices. *Current Heart Failure Reports*. 2009;6:287-292.[5]

HOW THE CARDIOMEMS HF SYSTEM WORKS



The PA sensor is inserted via right heart catheterization.

Patient takes daily sensor reading from the comfort of their home.

Data wirelessly transmitted to Merlin.net, a secure website that easily presents PA pressure data to inform proactive treatment modifications.

Clinician reviews data and contacts patient, as necessary.

PATIENT SELECTION

Indicated for patients with NYHA Class III HF symptoms who have had a Heart Failure Hospitalization within the last 12 months.

Contraindicated in patients who are unable to take DAPT for one-month post implant

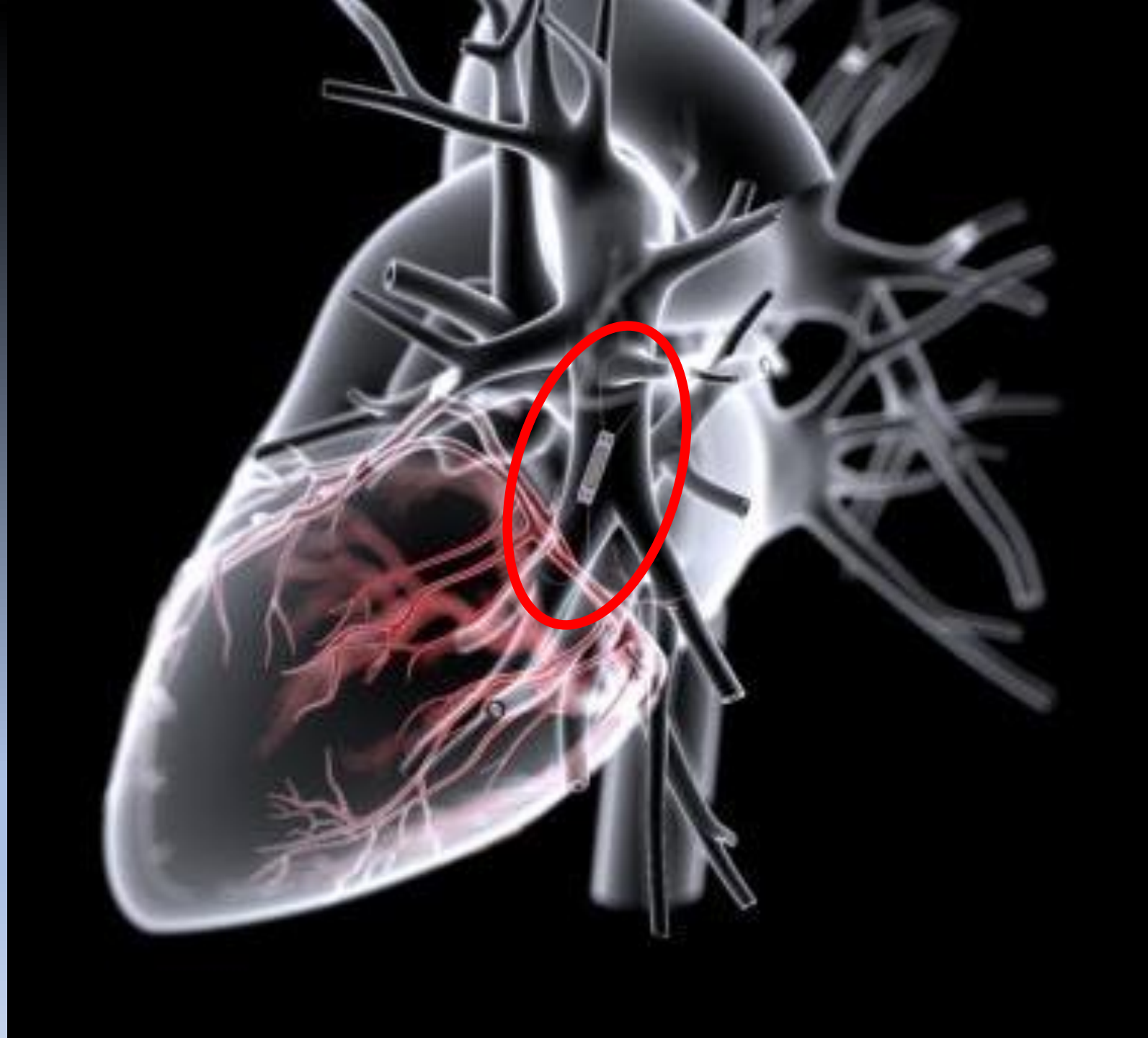
In addition, patients with the following may not be appropriate:

- Unable to make med changes over the phone
- Active infection
- Recurrent PE/DVT
- Dialysis
- Congenital HD or mechanical right heart valves
- Known coagulation disorders
- CRT implant in last 3 months
- Chest circumference >35
- COMPLIANCE

PRE-IMPLANT EDUCATION

- Introduce education in the in-patient setting when able
- Heart failure education
- How the device works
- What is expected post implant (daily readings, medication changes over the phone, follow up labs)
- Goal: improve quality of life, reduce HF hospitalizations and clinic visits
- How the device is implanted

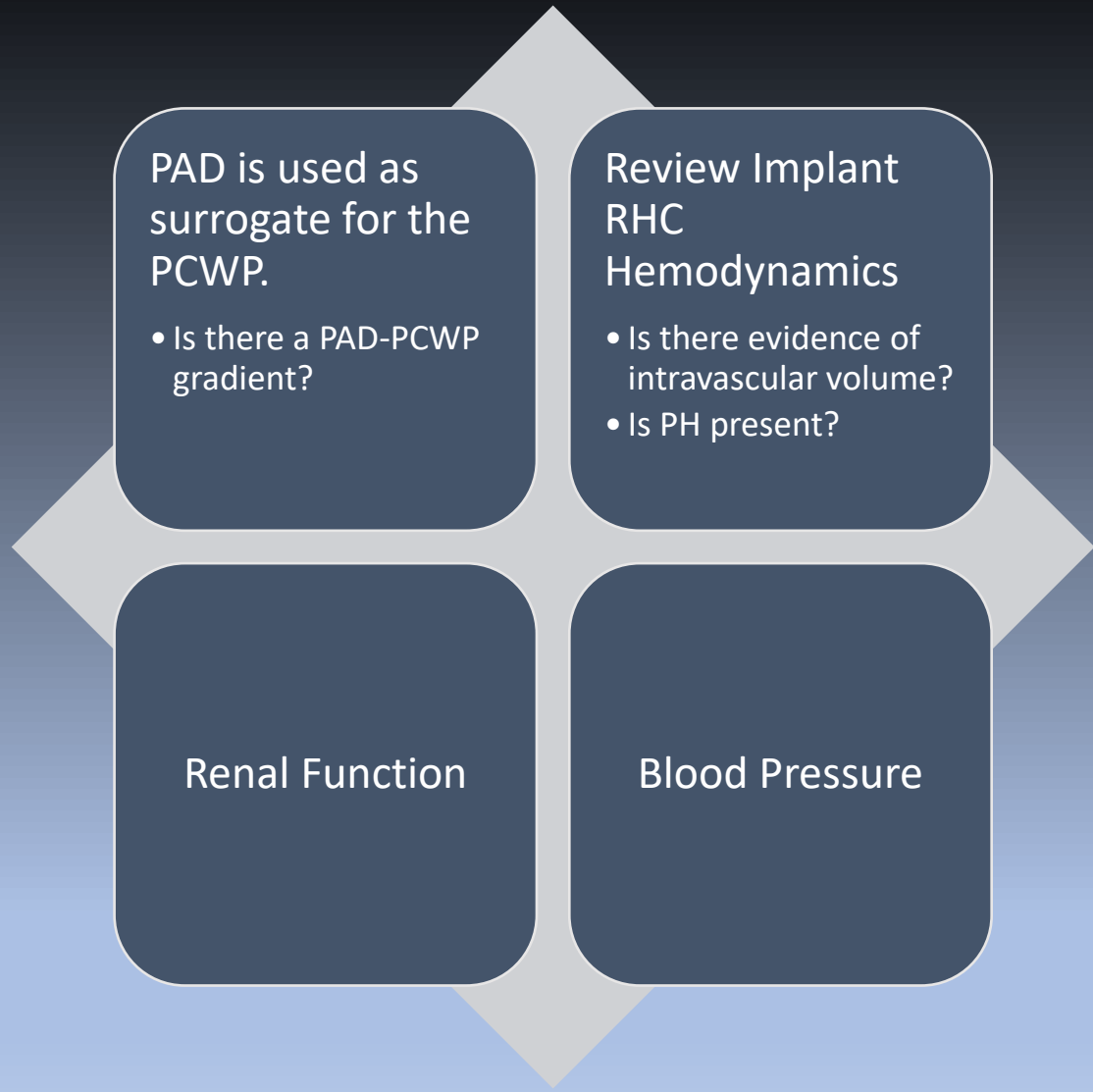
TARGET LOCATION FOR CARDIOMEMS SENSOR

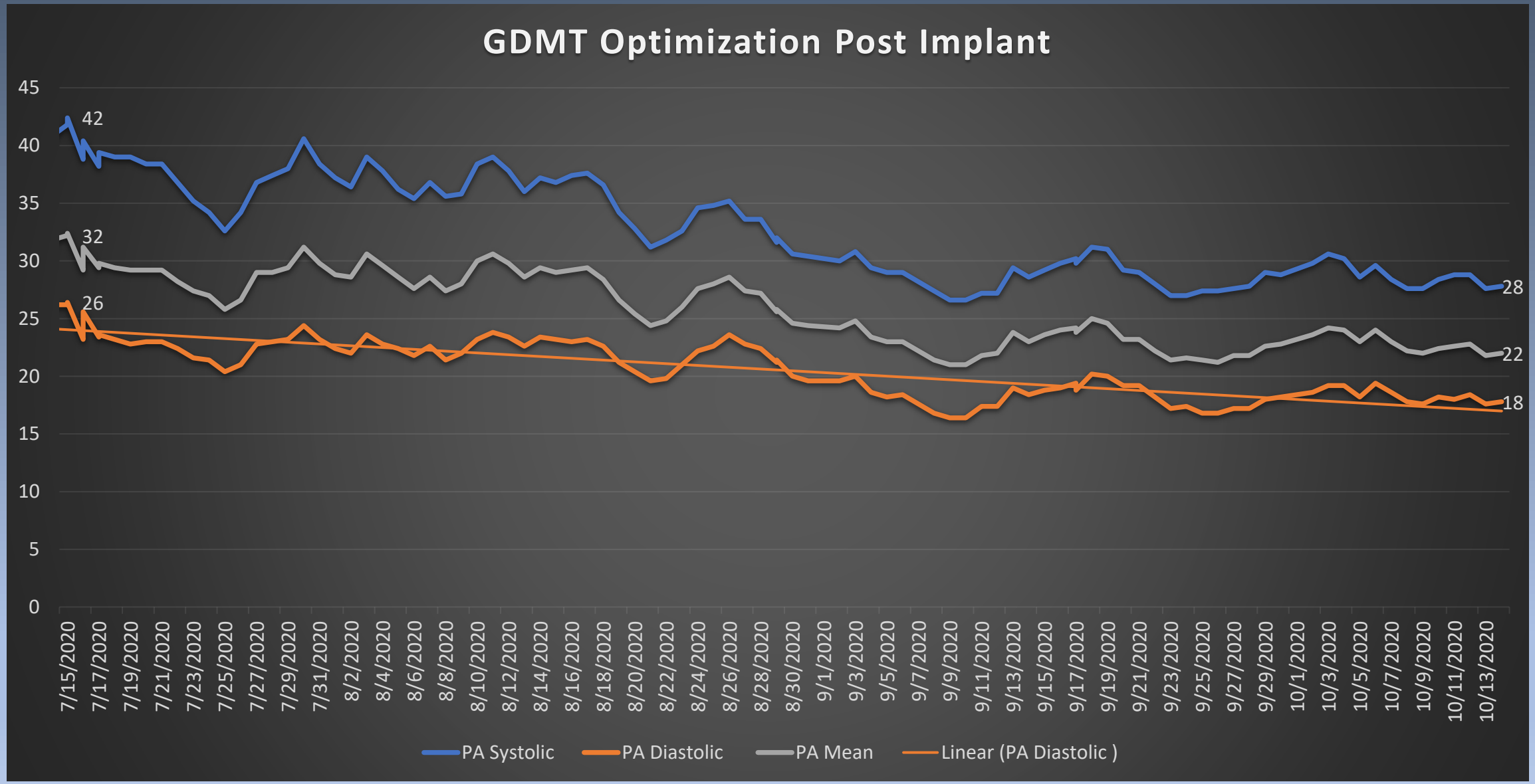


POST IMPLANT EDUCATION

- Importance of daily readings
- Continued HF education
- Low sodium diet/fluid restriction adherence
- Medication optimization
- PAD “goal” and PAD “Thresholds”
- PAD *trends*

DETERMINING TREATMENT PLAN POST-CARDIOMEMS IMPLANT

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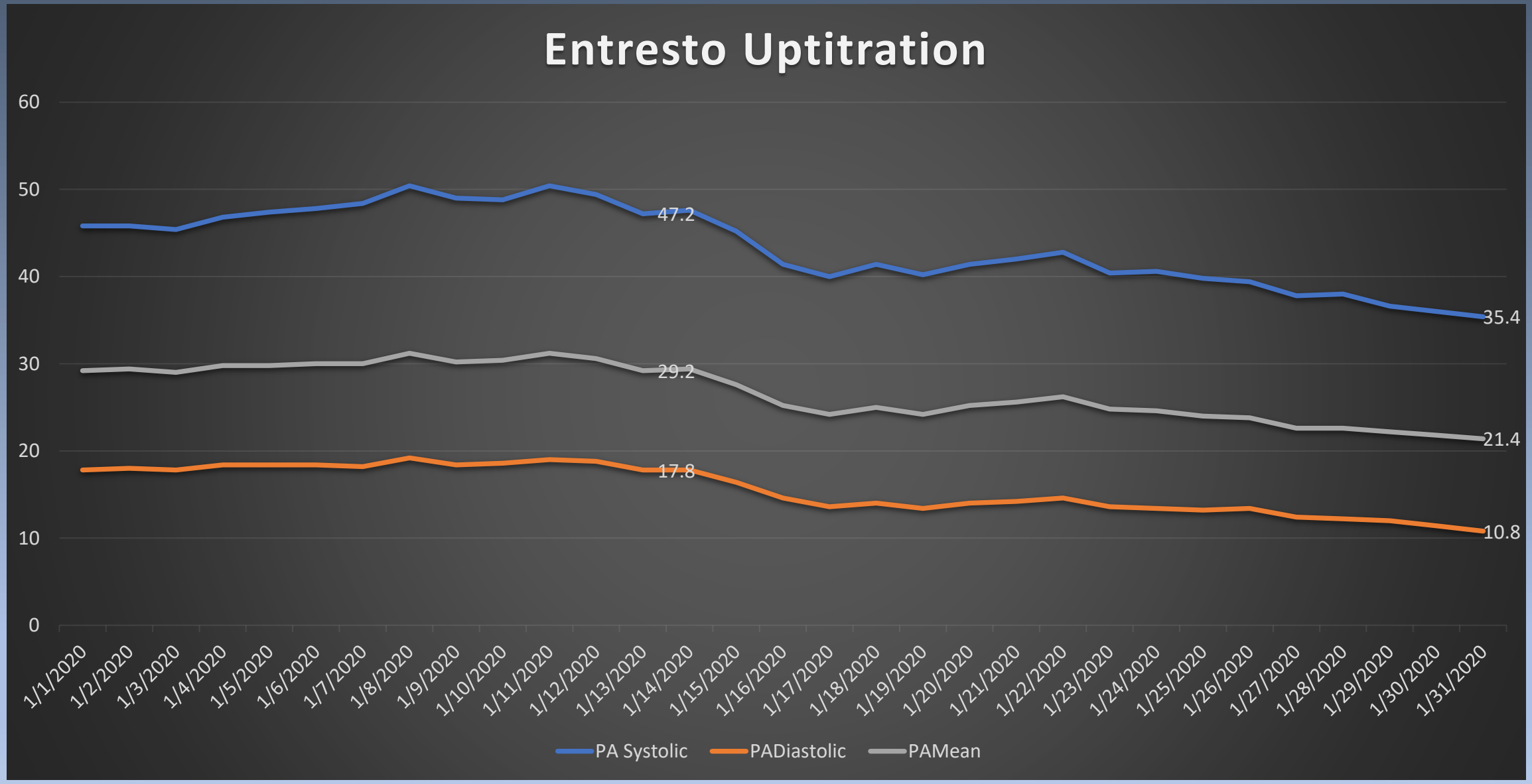
PA Systolic
PA Diastolic
PA Mean
Linear (PA Diastolic)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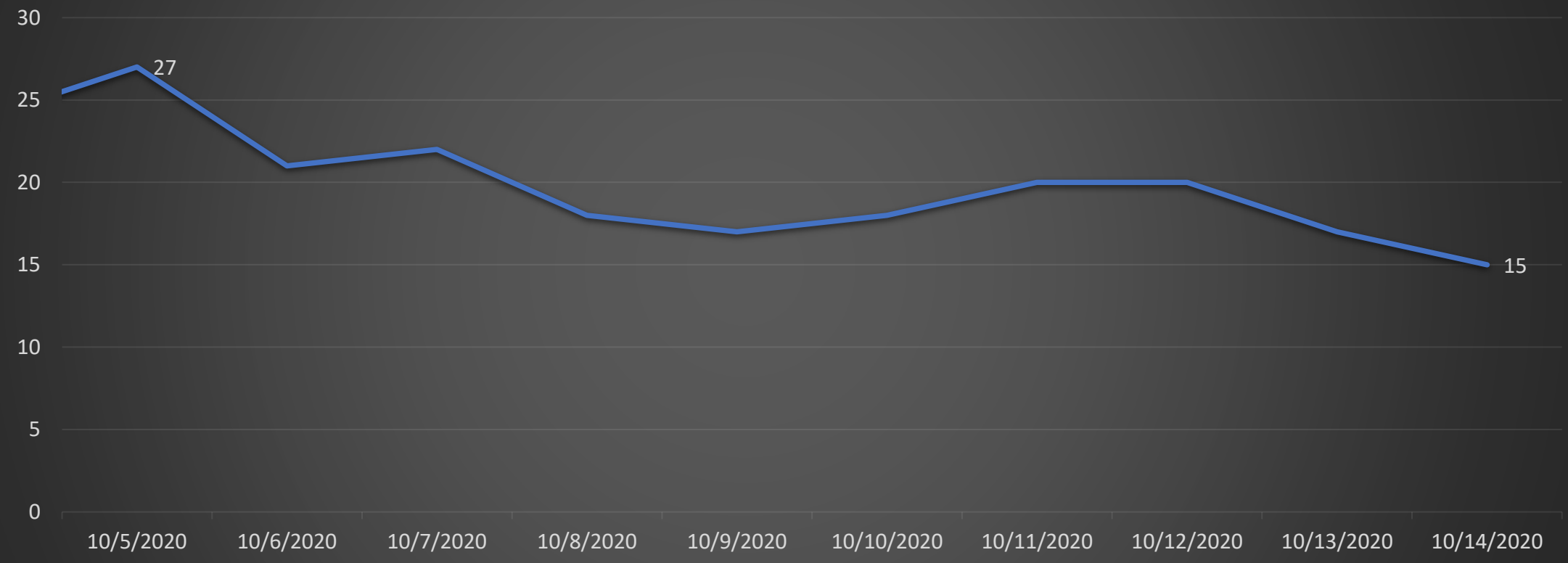
PA Systolic
PADiastolic
PAMean

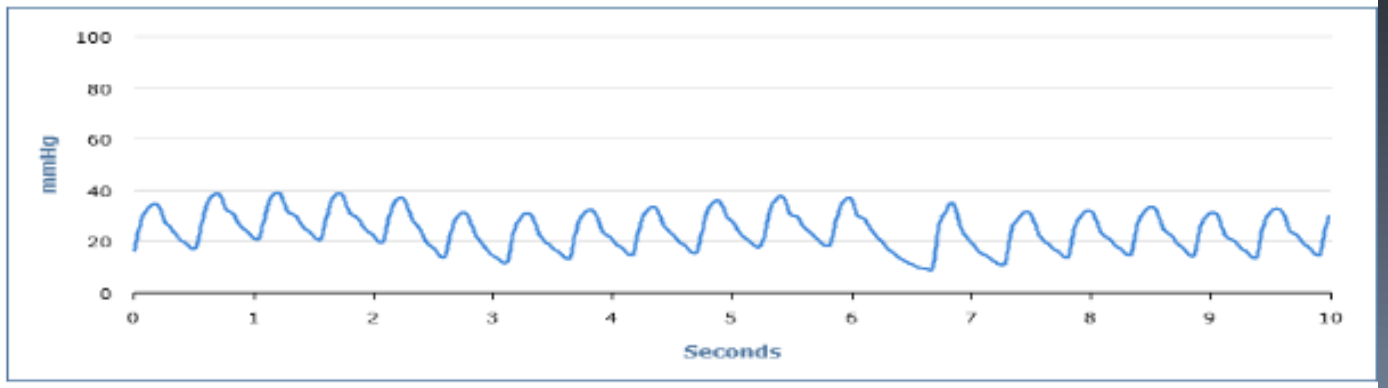
PAD Trend after Farxiga Start



PRE STRESS TEST PA PRESSURES:

Taken on 11-20-2019, 11:46 AM

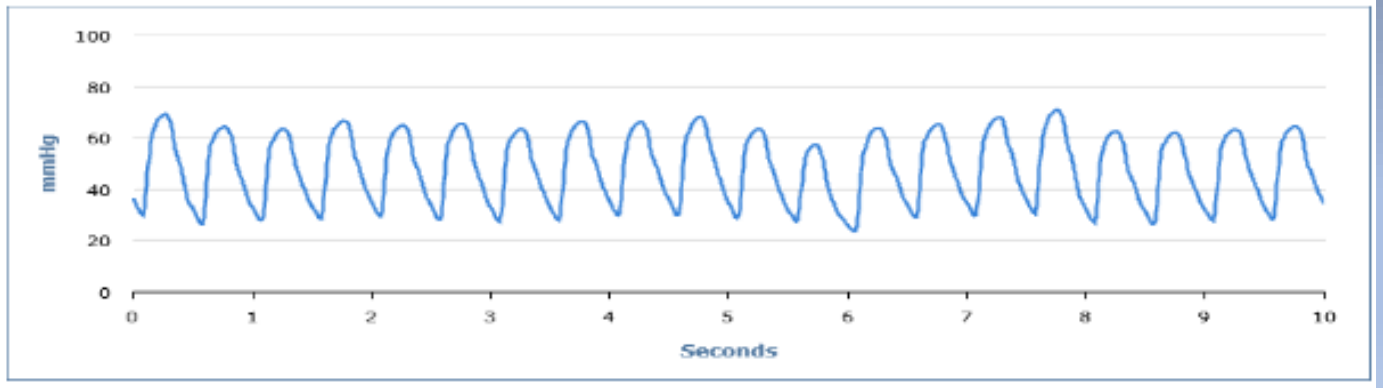
PA Systolic: 35 mmHg **PA Diastolic:** 15 mmHg **PA Mean:** 25 mmHg **Heart Rate:** 110 bpm



POST STRESS TEST PA PRESSURES:

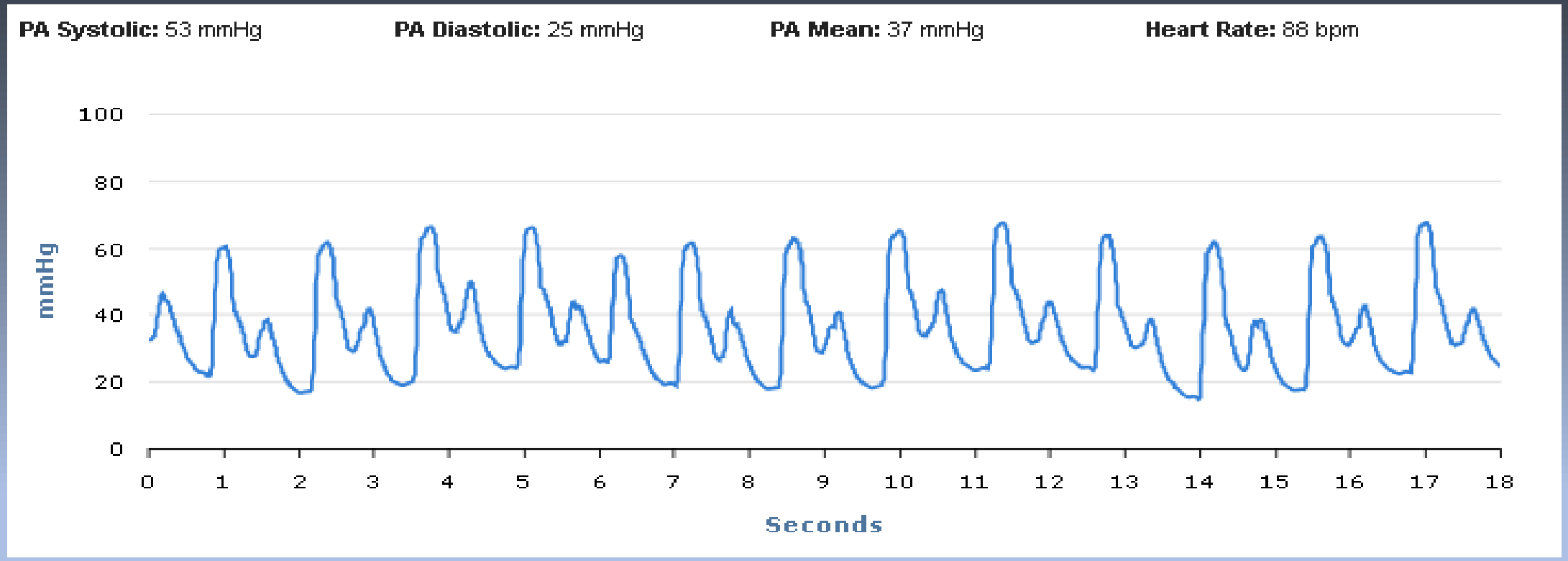
Taken on 11-20-2019, 12:22 PM

PA Systolic: 65 mmHg **PA Diastolic:** 28 mmHg **PA Mean:** 49 mmHg **Heart Rate:** 120 bpm

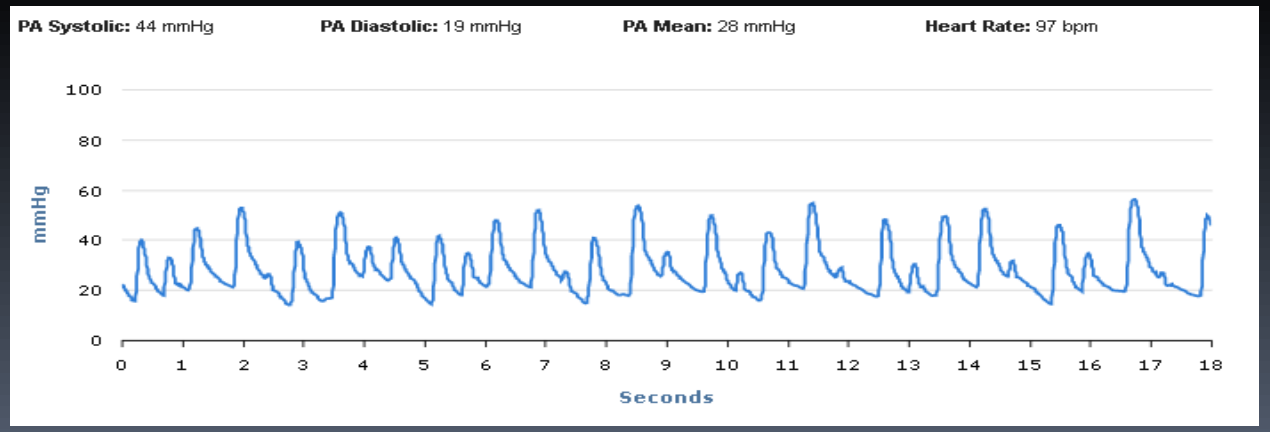


EXERCISE INDUCED PULMONARY HYPERTENSION

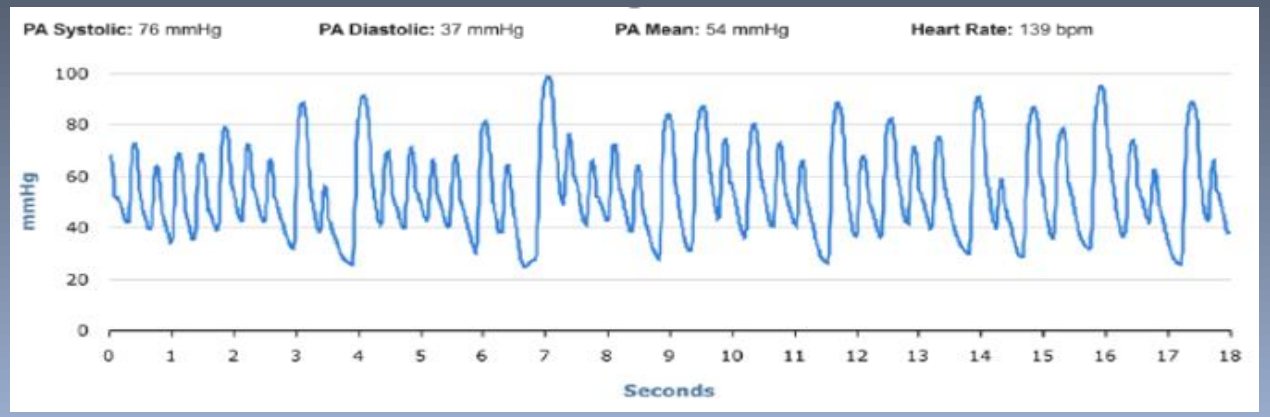
ANOTHER BENEFIT OF CARDIOMEMS: Arrythmia Detection



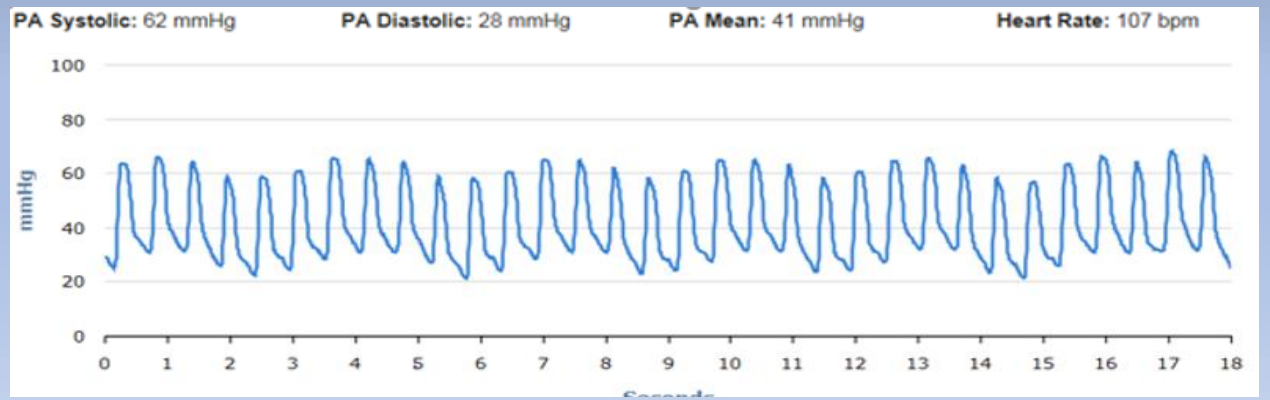
Bigeminy PVCs



Afib



Afib



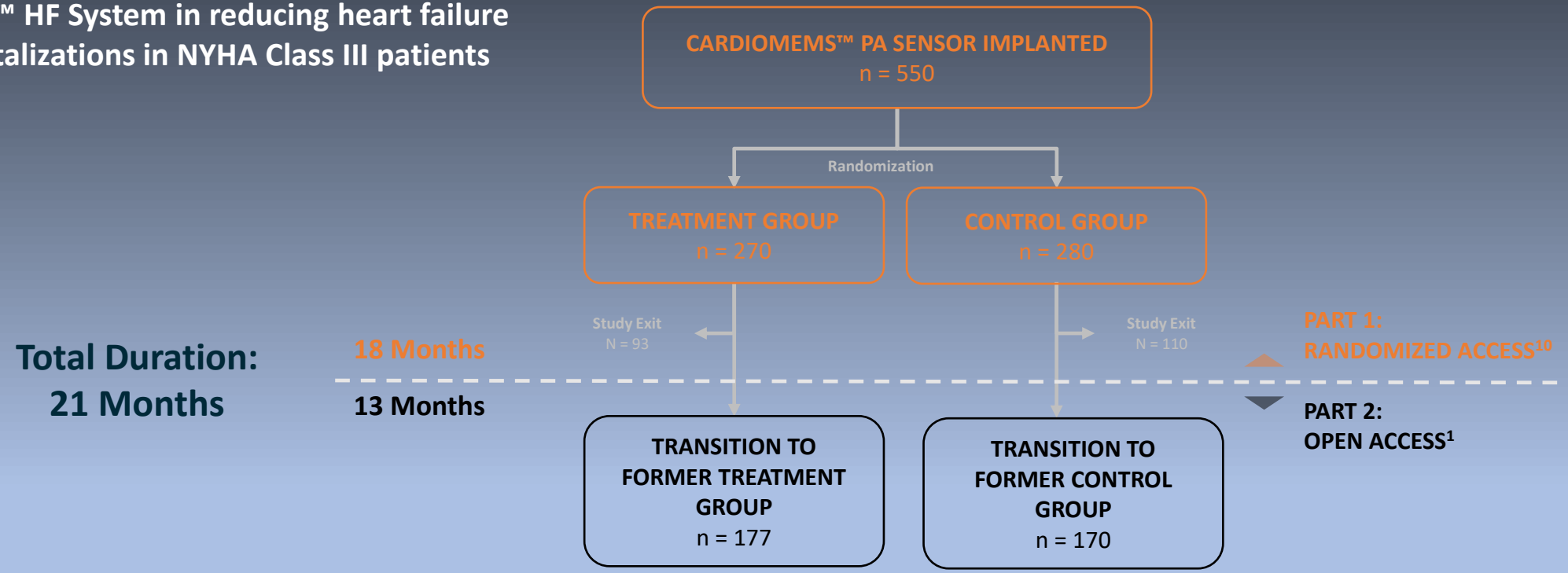
Aflutter

CHAMPION TRIAL

TRIAL PURPOSE

Evaluate the safety and efficacy of the CardioMEMS™ HF System in reducing heart failure related hospitalizations in NYHA Class III patients

TRIAL DESIGN



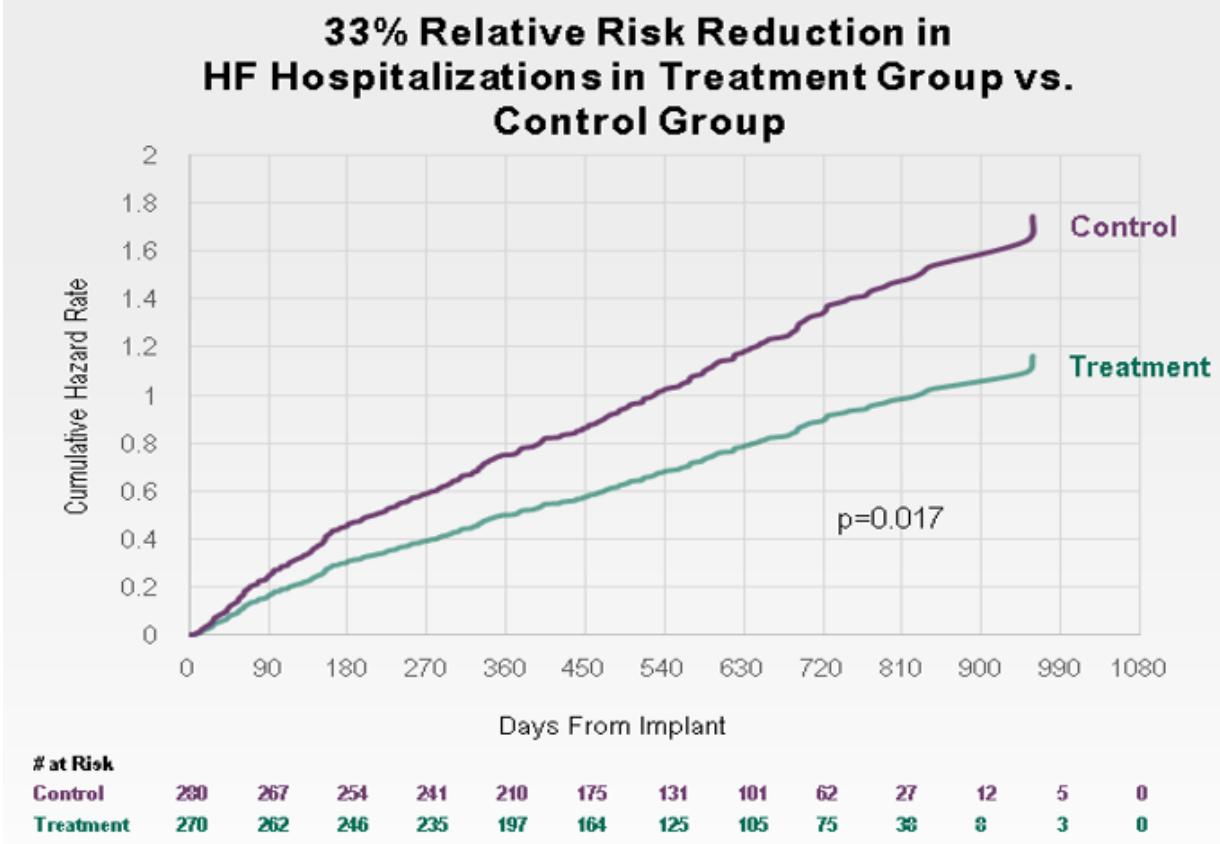
Total Duration: 21 Months

1. Abraham WT, et al. *Lancet.* 2016.
10. Abraham WT, et al. *Lancet.* 2011.

CHAMPION TRIAL RESULTS:

PRIMARY ENDPOINT

PART 1: RANDOMIZED ACCESS | PART 2: OPEN ACCESS



Patients managed with PA pressure data had a significant relative risk reduction as compared to the control group.

CHAMPION TRIAL SUB-ANALYSIS:

Patients With Pulmonary Hypertension

PURPOSE	Evaluate the effect of PA pressure monitoring in HF patients with comorbid pulmonary hypertension (PHTN, mean PA pressure > 25mmHg, n = 314).

51%
reduction

in HF hospitalizations for HF patients with PHTN who were managed with PA pressure compared to SOC.

0.60 vs. 0.94, HR = 0.64, 95% CI 0.51-0.81, p = 0.0002

30%
reduction

in HF hospitalizations for PHTN patients with TPG > 15 who were managed with PA pressure compared to SOC.

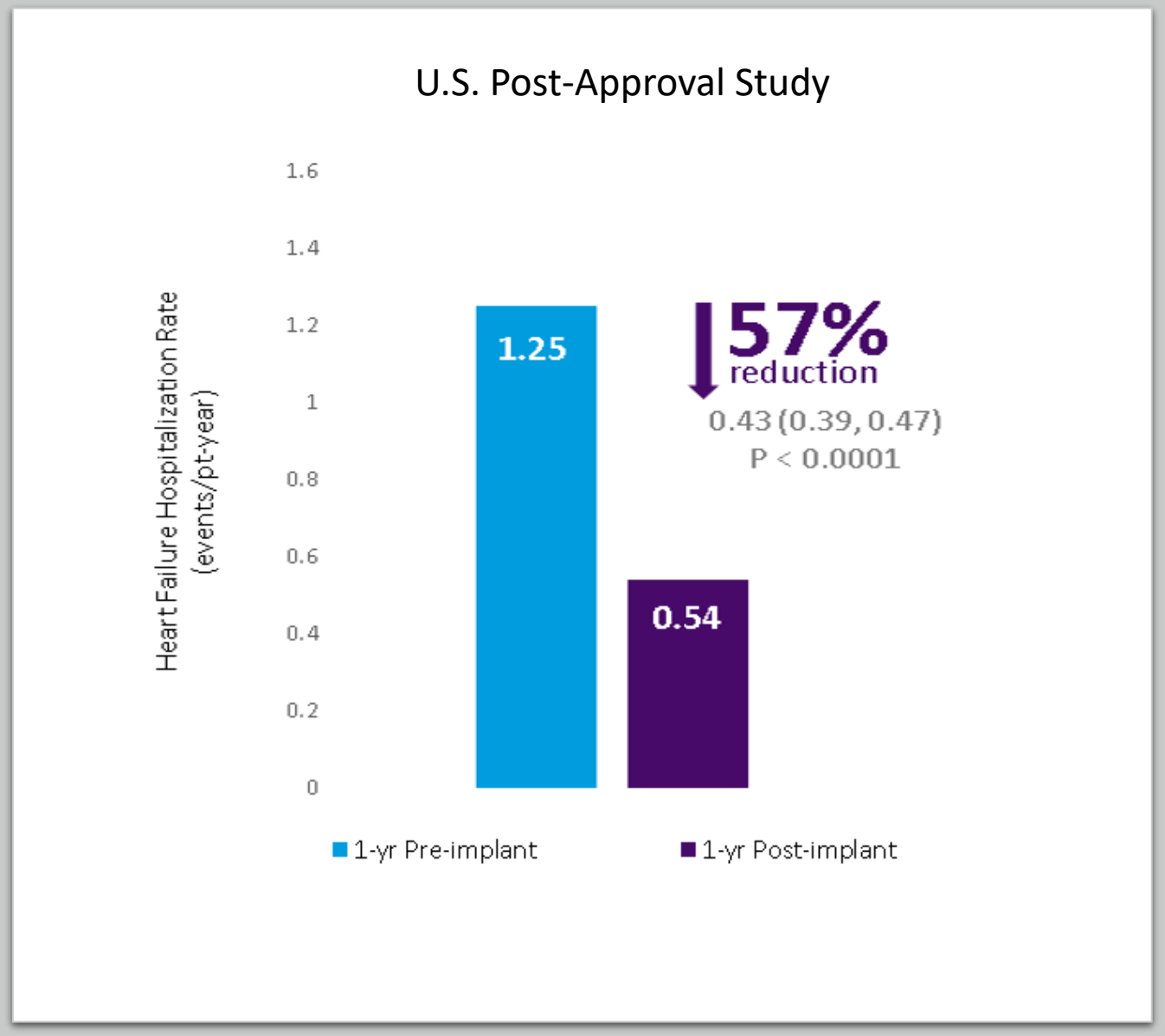
p = 0.08

REDUCTION IN HF HOSPITALIZATIONS

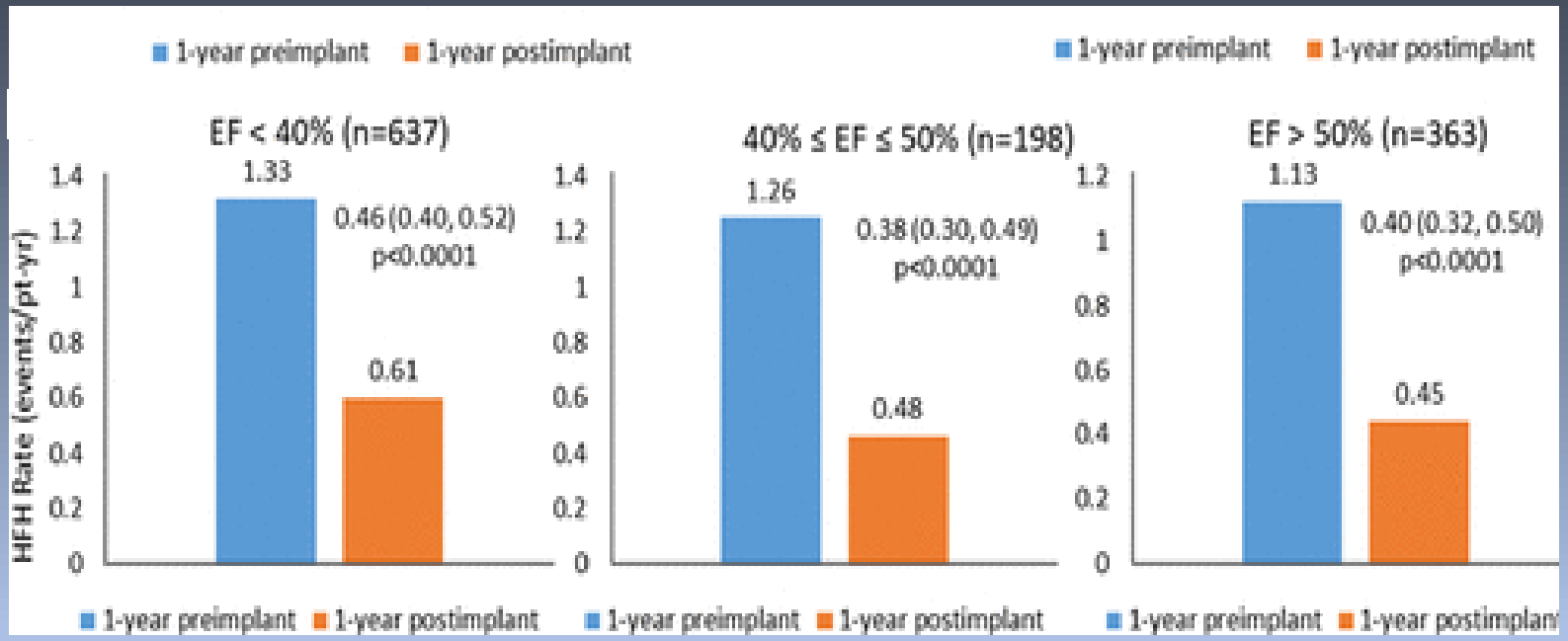
in HF patients with comorbid pulmonary hypertension.

Benza R, et al. Journal of Cardiac Failure, 2012.

HEART FAILURE HOSPITALIZATION REDUCTION



SIGNIFICANT REDUCTION IN HF HOSPITALIZATIONS REGARDLESS OF EJECTION FRACTION



Shavelle, et al. *Circ HF*. 2020.

CONCLUSION

- CardioMEMS has proven to decrease HF hospitalizations
- CardioMEMS is a TRENDING TOOL– Don’t treat daily change
- Remember symptoms often occur later. Weights, symptoms not reliable
- Remote monitoring is the future!

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Leslie Steinkamp, RN
CVM Advanced Heart Failure Clinic
The University of Kansas Health System

Phone: 913-588-0304
Email: Lsteinkamp@kumc.edu