

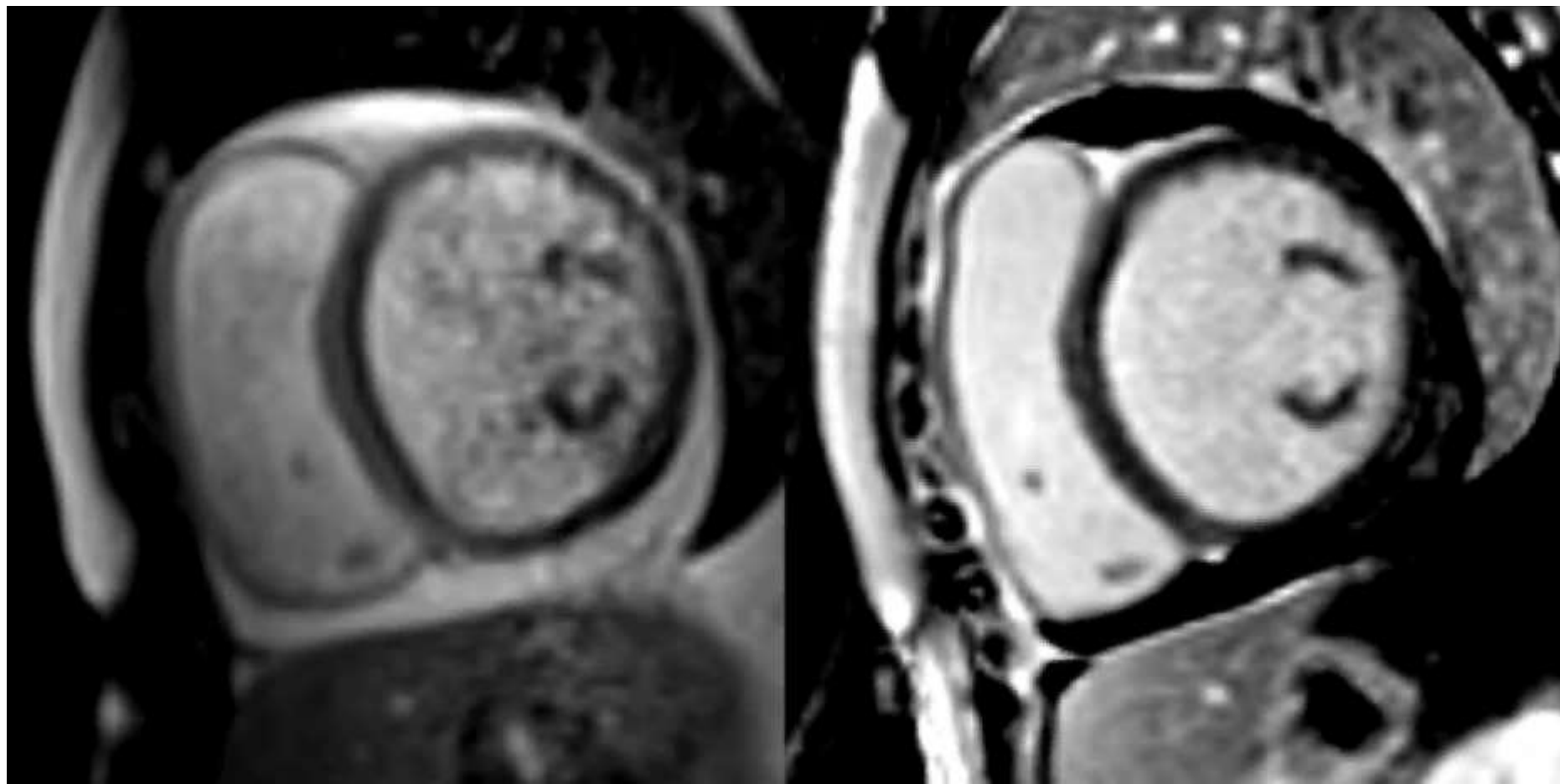
# Remodeling and Recovery in Peripartum Cardiomyopathy:

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Failure Research**

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Medical Center**



**18 year old woman two weeks post partum:  
LVEF 18% with marked biventricular enlargement**

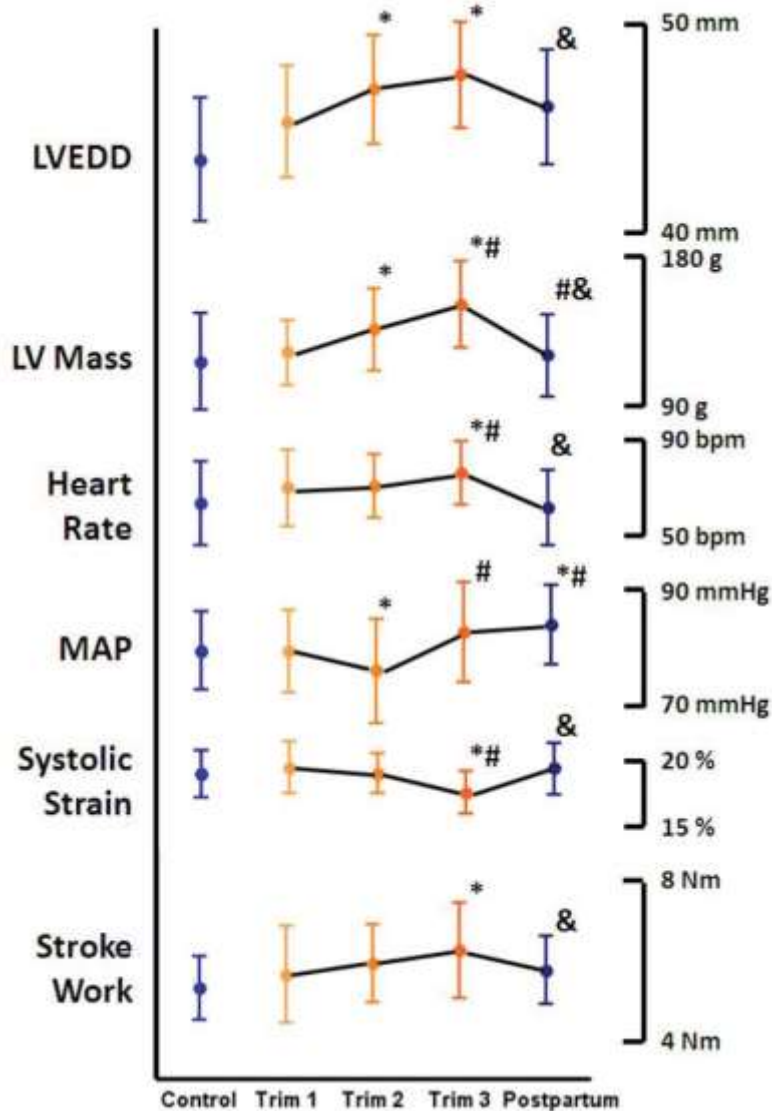


# Remodeling in PPCM



- **LVEF at presentation predicts outcomes**
- **Remodeling (LV end diastolic diameter or LVEDD) is potentially a stronger predictor of recovery**
- **Factors which impact recovery do so through an impact on remodeling**

# Physiologic Left Ventricular Remodeling in Pregnancy



- Important adaptation to sustained “volume work”
- Increased SV to increase CO and provide for placental blood flow
- Rapid reverse remodeling in the early post partum phase

# Proportional Increase in Hypertrophy and LVEDD

Variables	A) Female controls	B) Second trimester	C) Third trimester	p value
<b>Dimensions</b>				
Interventricular septum (cm)	0.77±0.12 <sup>c</sup>	0.81±0.10	0.84±0.11 <sup>a</sup>	0.045
Posterior wall thickness (cm)	0.75±0.14 <sup>c</sup>	0.82±0.10	0.86±0.10 <sup>a</sup>	0.002
LV Dimension, diastole (cm)	4.5±0.3	4.8±0.4	4.7±0.4	0.05
LV Dimension, systole (cm)	2.8±0.3 <sup>bbb,c</sup>	3.2±0.3 <sup>aaa</sup>	3.0±0.4 <sup>a</sup>	<0.001
LV Mass index (g/m <sup>2</sup> )	63±12 <sup>b,c</sup>	71±9 <sup>a</sup>	72±14 <sup>a</sup>	0.018
Relative wall thickness	0.34±0.07	0.35±0.07	0.37±0.05	0.145
LVEF (%)	62±3	62±4	63±4	0.302
<b>Volumes</b>				
LA Volume (ml)	36±7 <sup>bb,c</sup>	44±14 <sup>aa</sup>	44±13 <sup>a</sup>	0.006

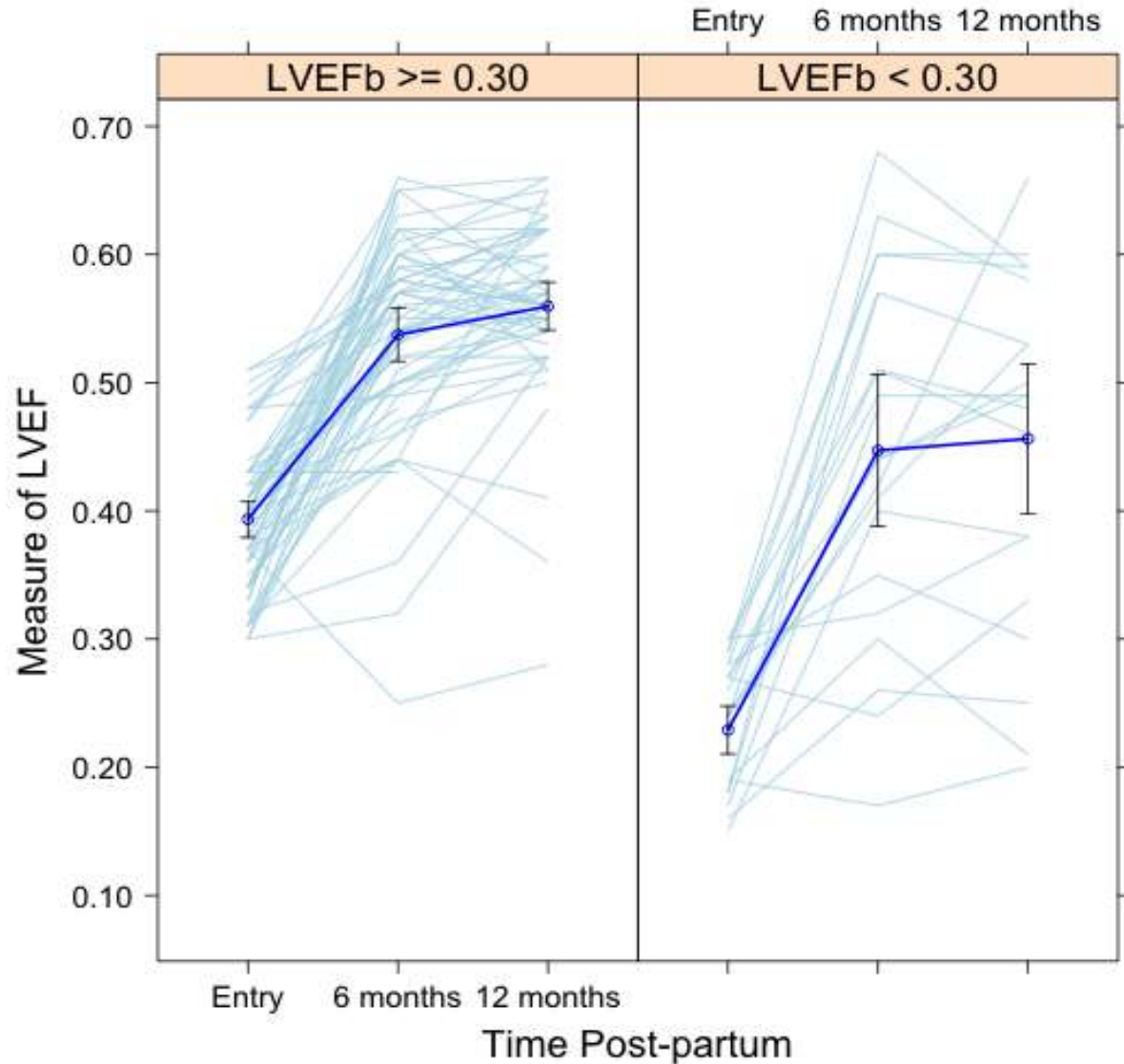
LV: Left ventricular, DT: deceleration time, LVEF: Left ventricle ejection fraction, LA: Left atrium, RVSP: Right ventricular systolic pressure, LAVI: Left atrium volume index,

# Investigation of Pregnancy Associated Cardiomyopathy: (IPAC)

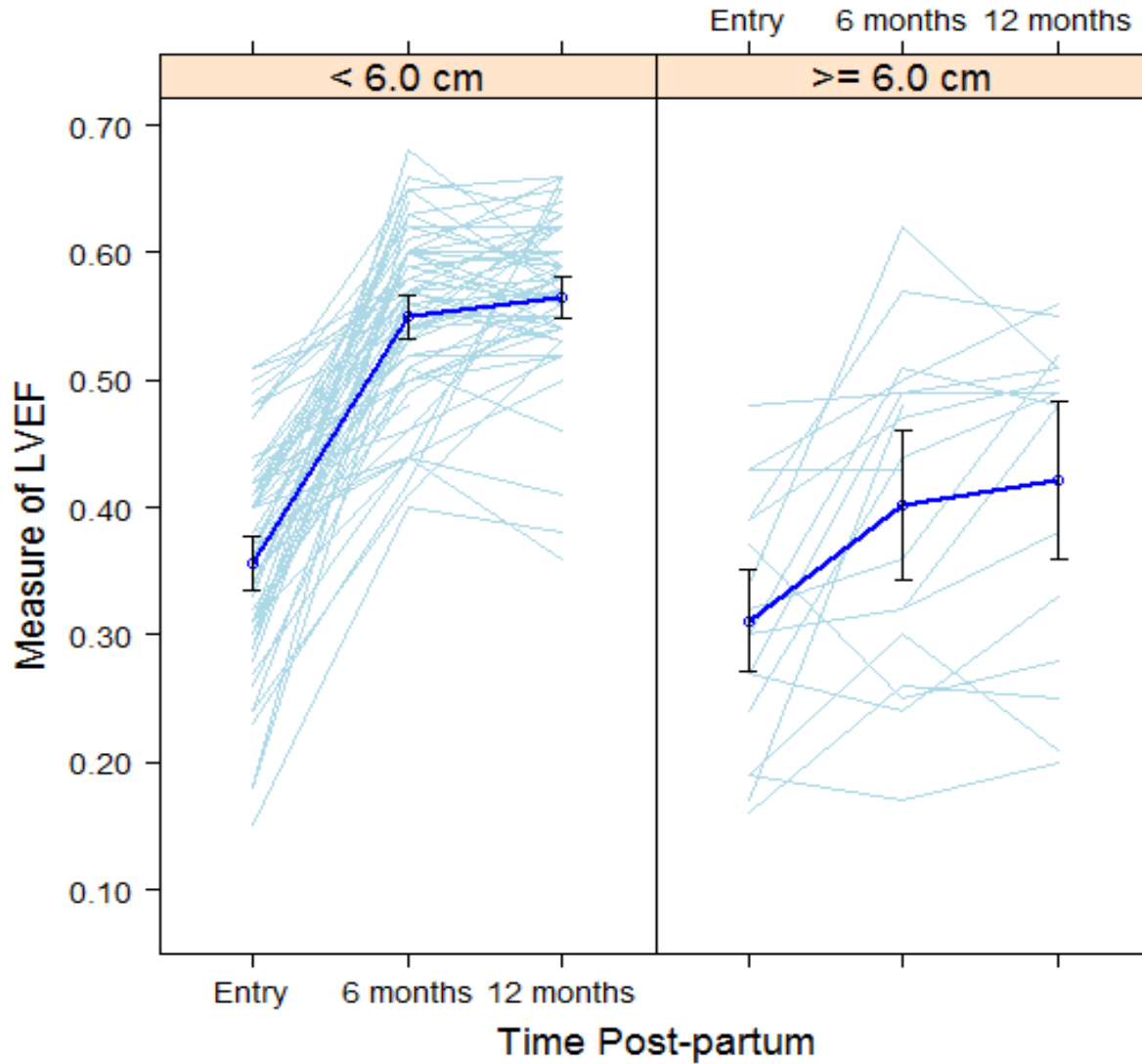


- **Prospective investigation, 100 women newly diagnosed with PPCM**
- **Clinical, biomarker and genetics predictors of recovery**
- **Network of 30 centers**  
<http://www.peripartumcmnetwork.pitt.edu>

# LVEF <0.30 and Recovery in IPAC



# LVEDD $\geq 6.0$ cm and Recovery in PPCM



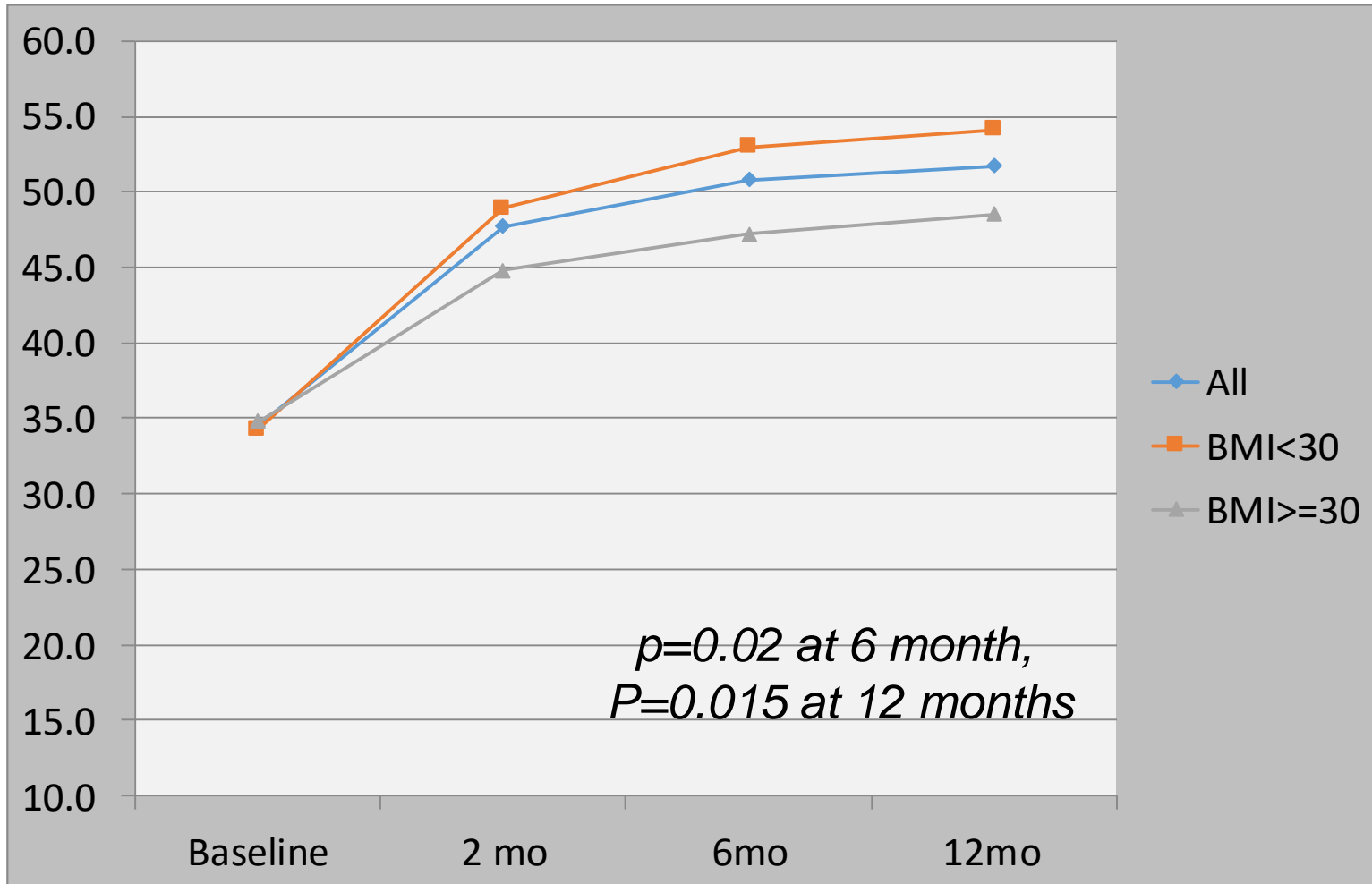


# Clinical Predictors, Remodeling and Recovery

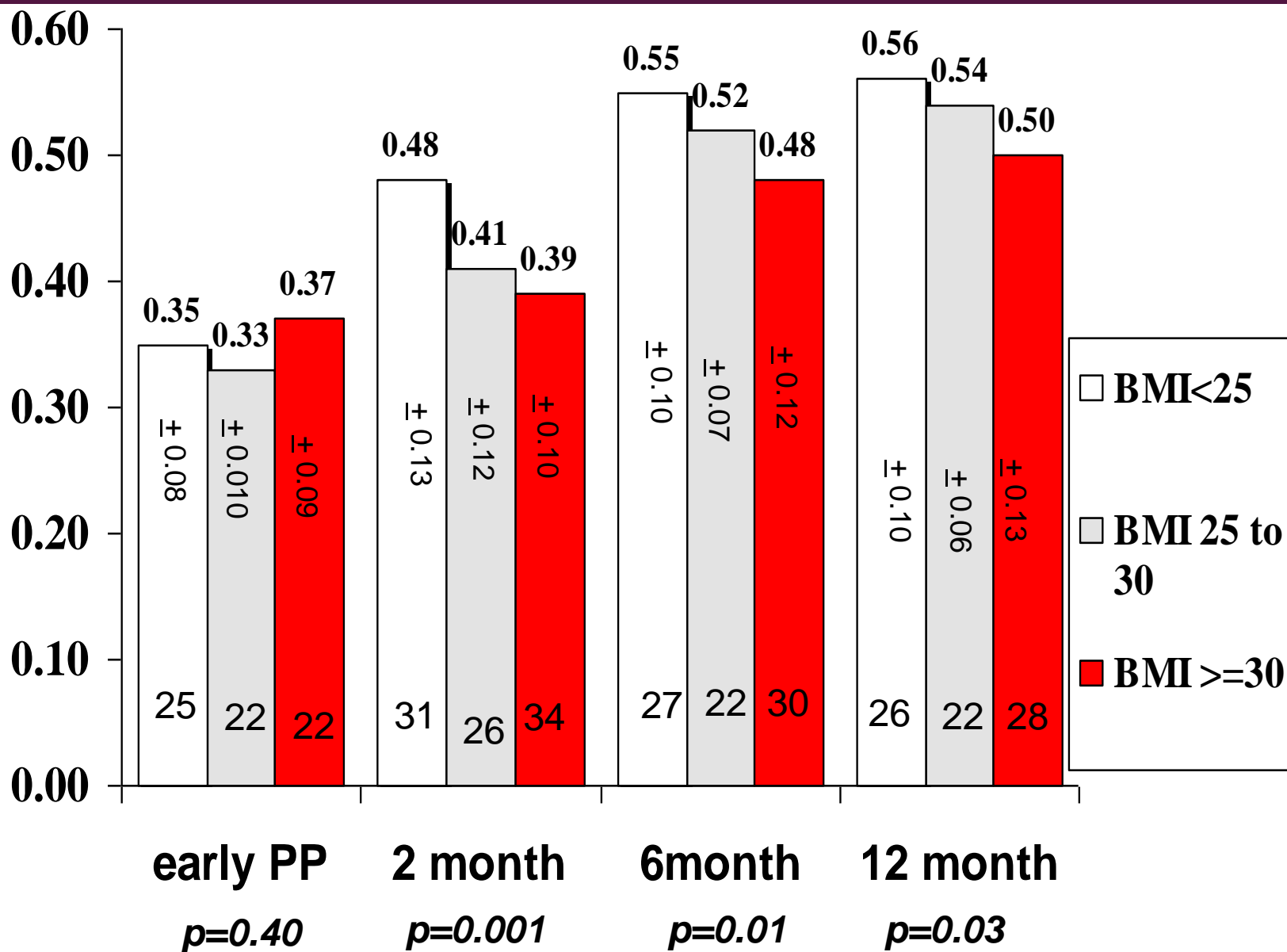


- **BMI**
- **Race**
- **Diabetes**

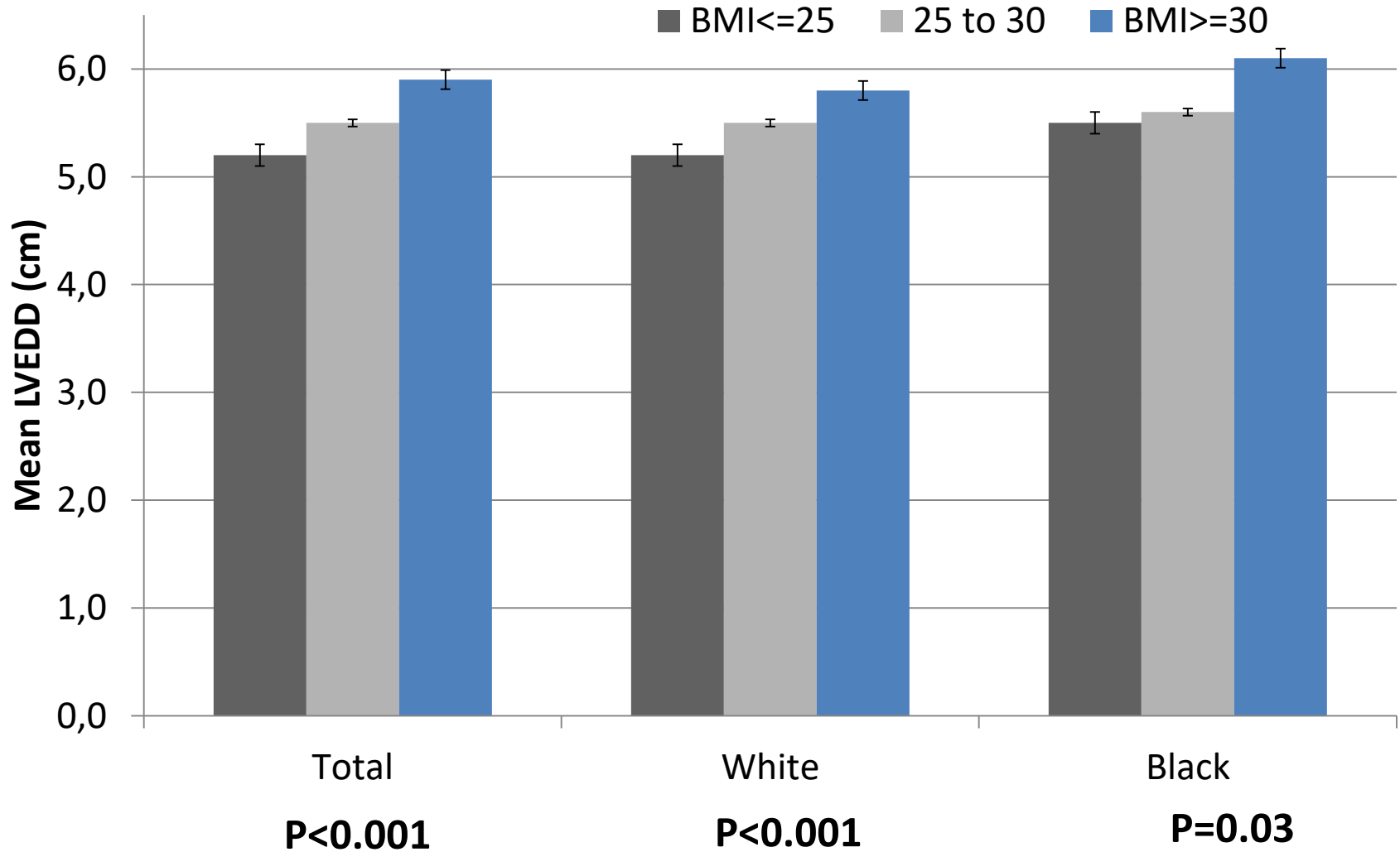
# BMI and recovery in PPCM



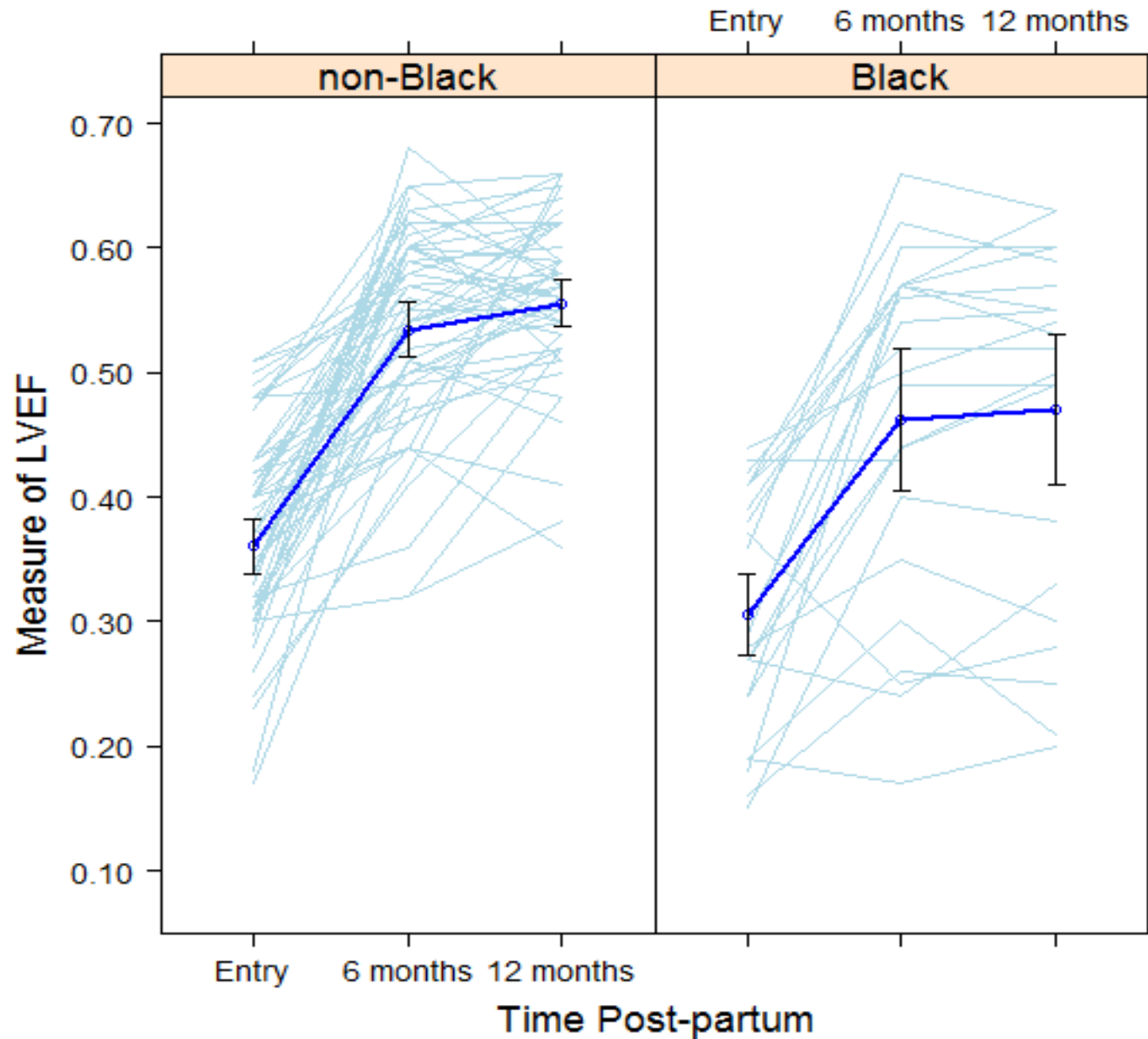
# LVEF over time: normal or underweight (BMI<25), overweight (25 to 29.9), obese (BMI≥30)



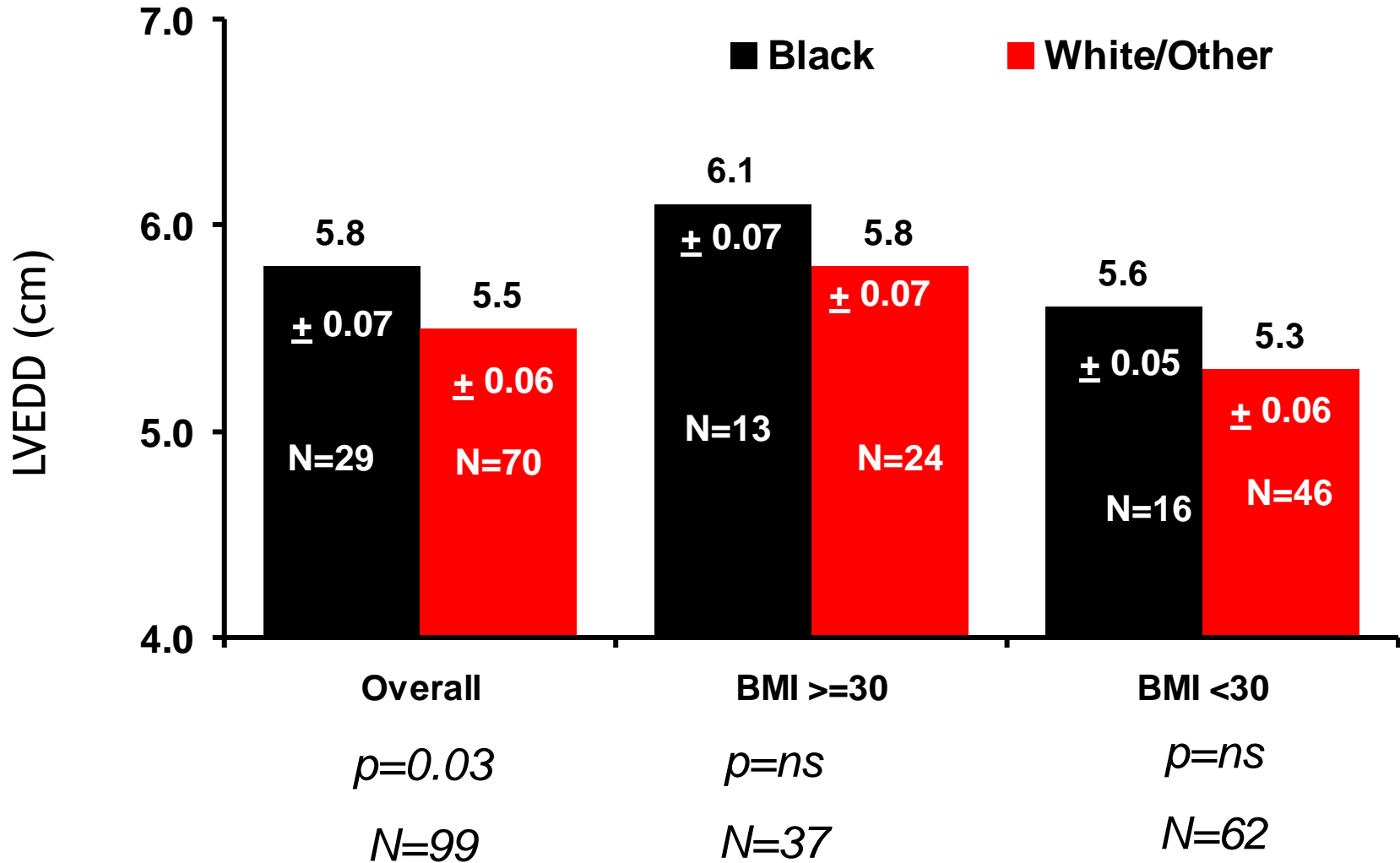
# LVEDD by BMI



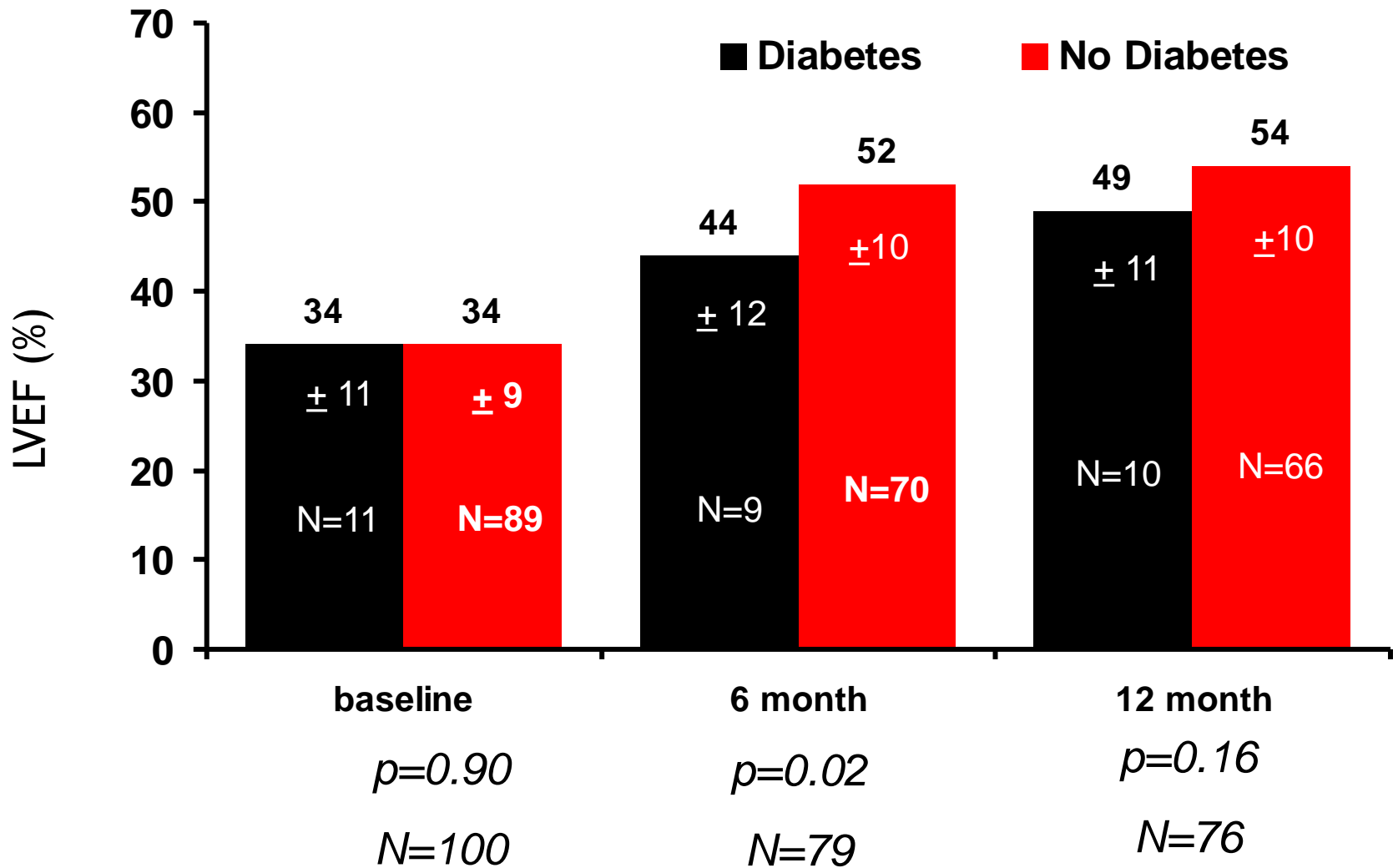
# Myocardial Recovery by race in IPAC:



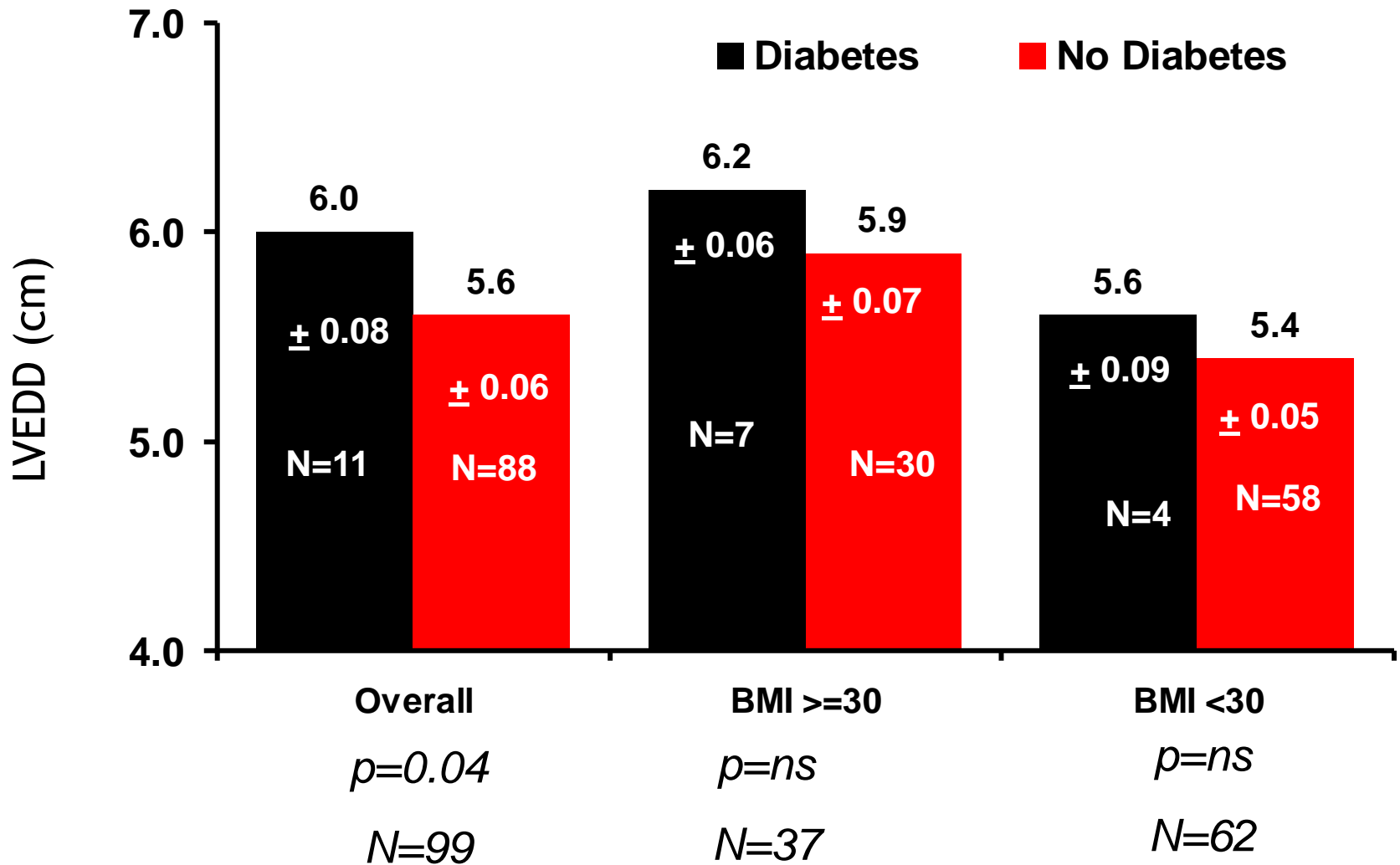
# LVEDD by Race: BMI subsets (IPAC)



# LVEF Recovery by Diabetes (IPAC)

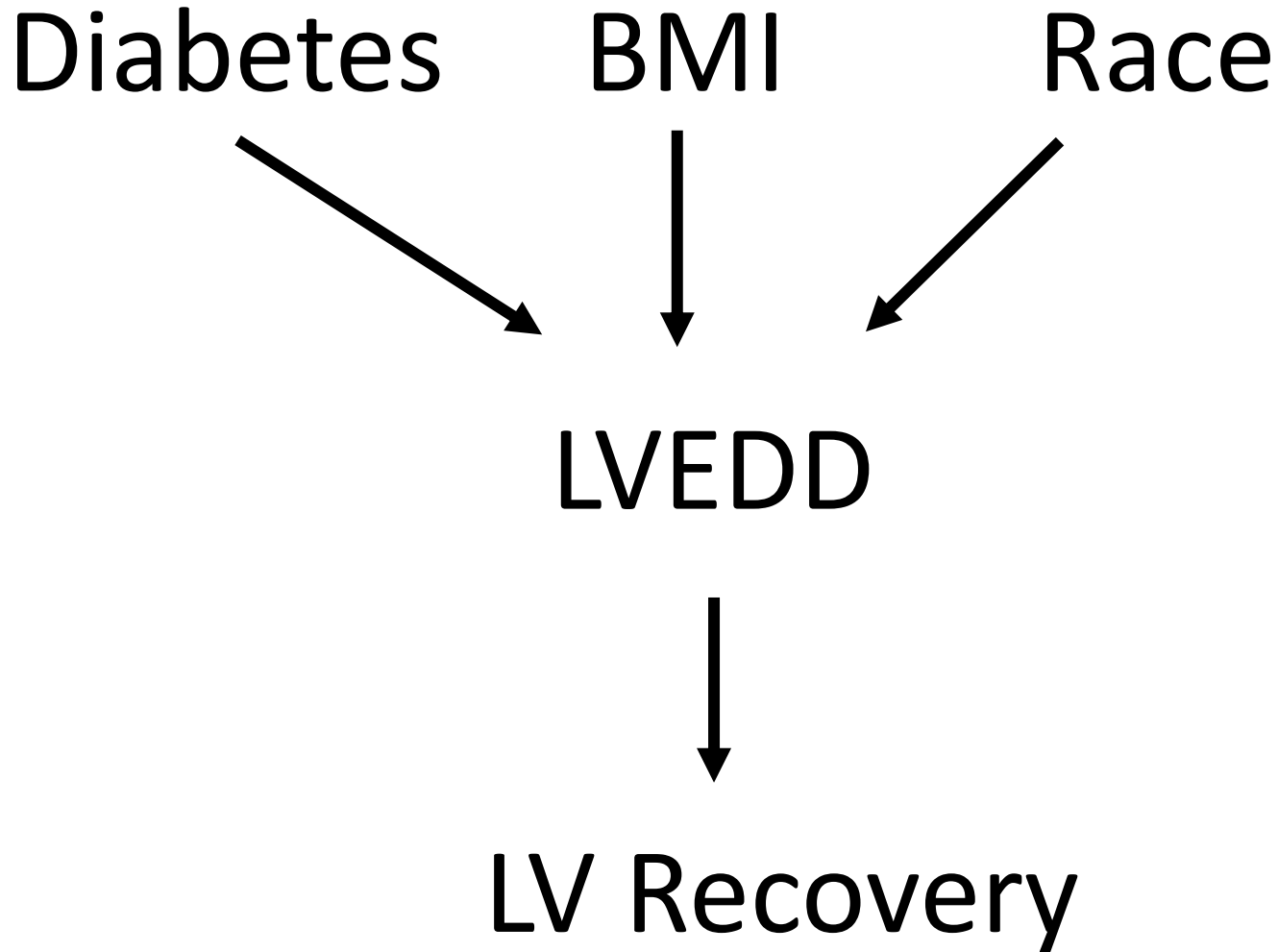


# LVEDD by Diabetes: BMI subsets (IPAC)





# Diabetes, BMI, Race and Recovery

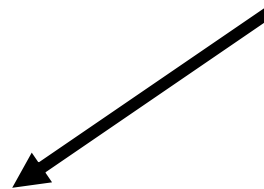
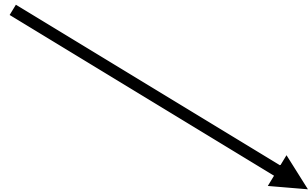


# Diabetes, BMI, Race and Recovery

Diabetes

BMI

Race



*Vascular changes, myocyte apoptosis,  
inflammation, fibrosis*



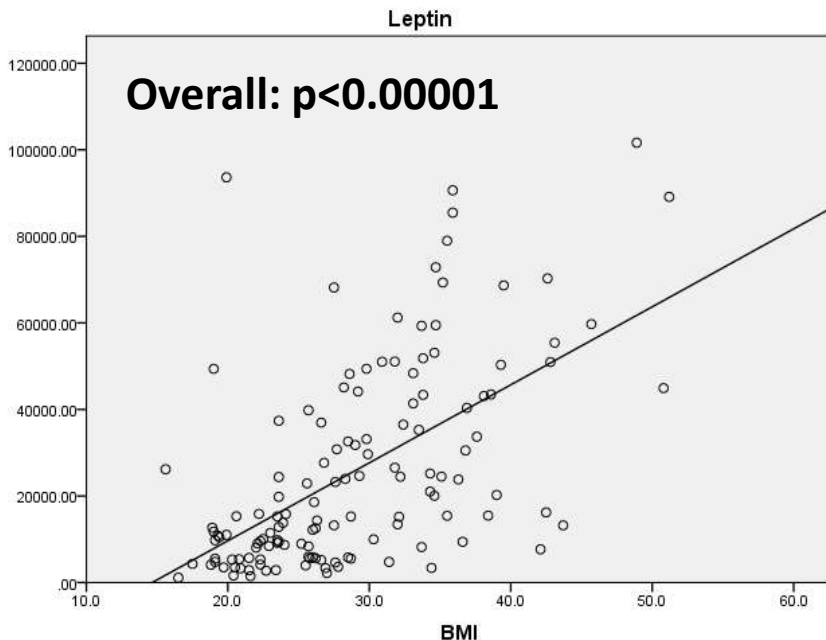
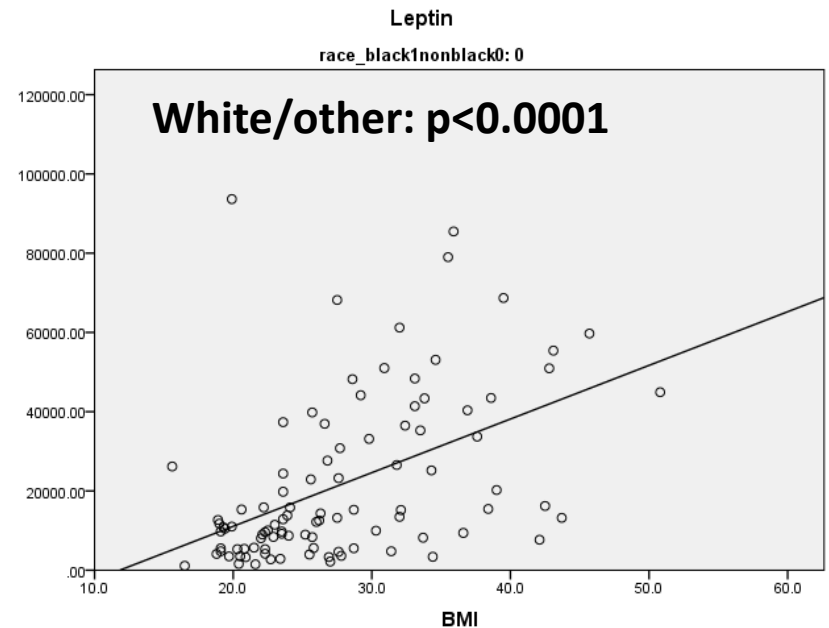
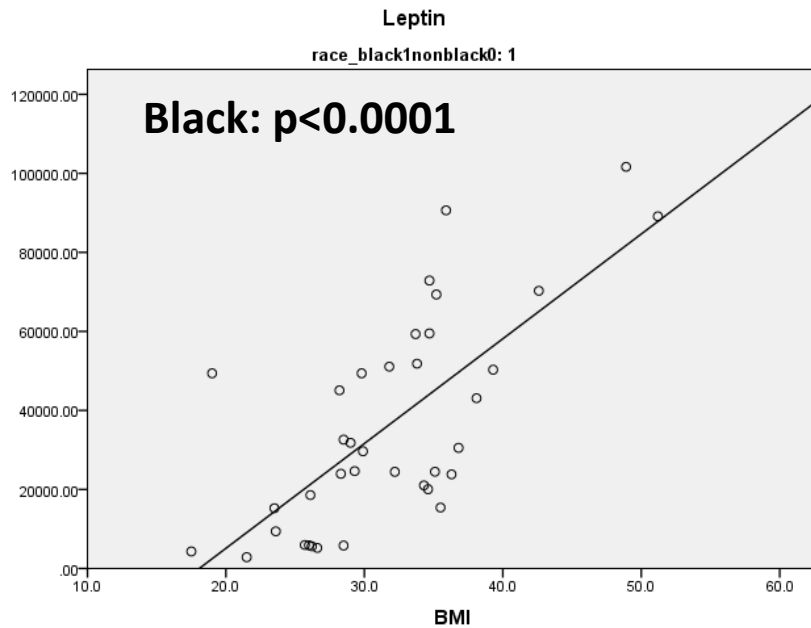
LVEDD



LV Recovery

# Leptin:

- 16 KD hormone secreted by adipose tissue
- Promotes vascular inflammation, oxidative stress and vascular smooth cell proliferation.
- Levels increase in HF subjects



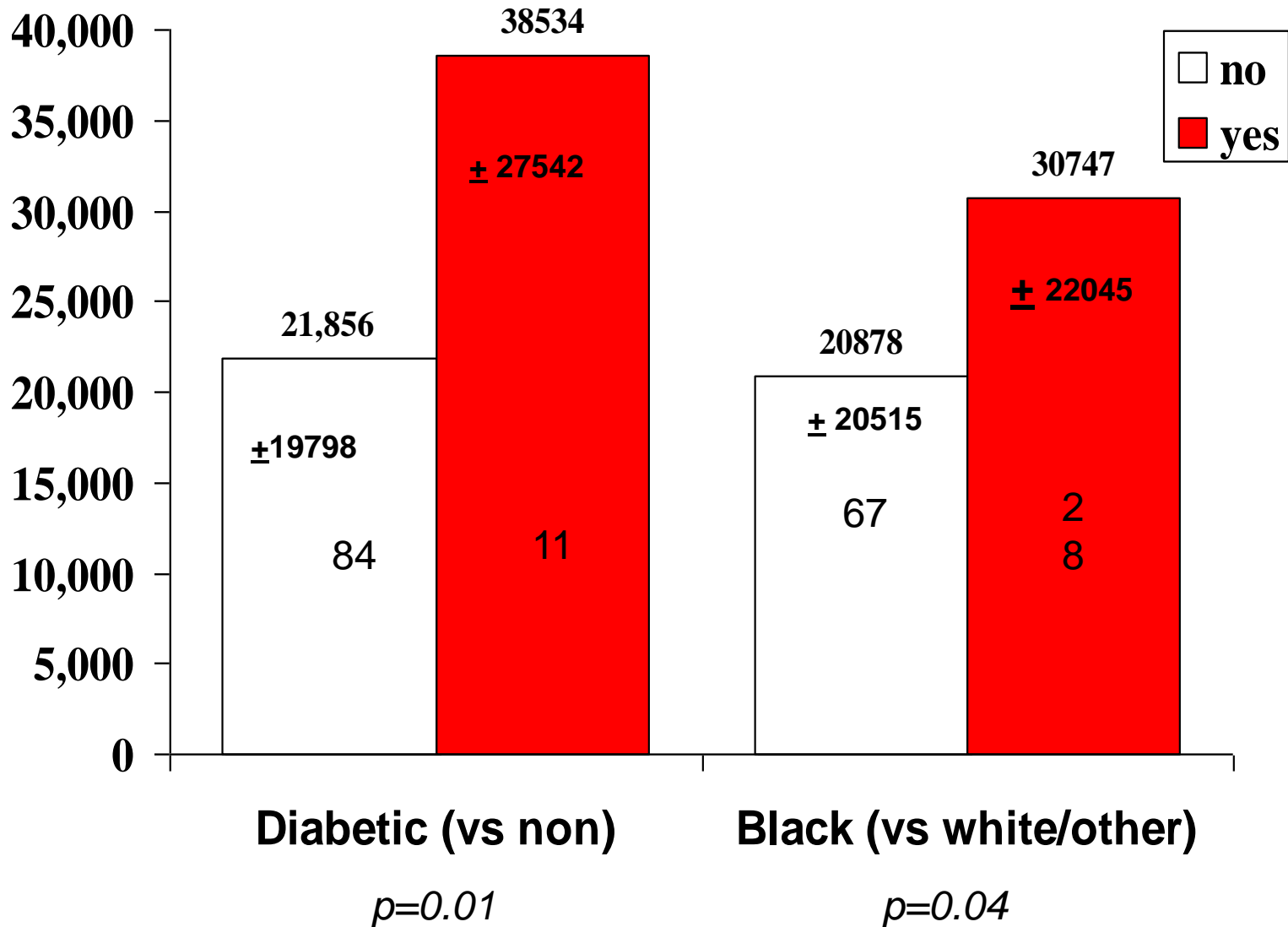
### Relationship of Leptin/BMI

Overall:  $p < 0.000001$ , Constant - 26409.67,  $B1 = 1803$

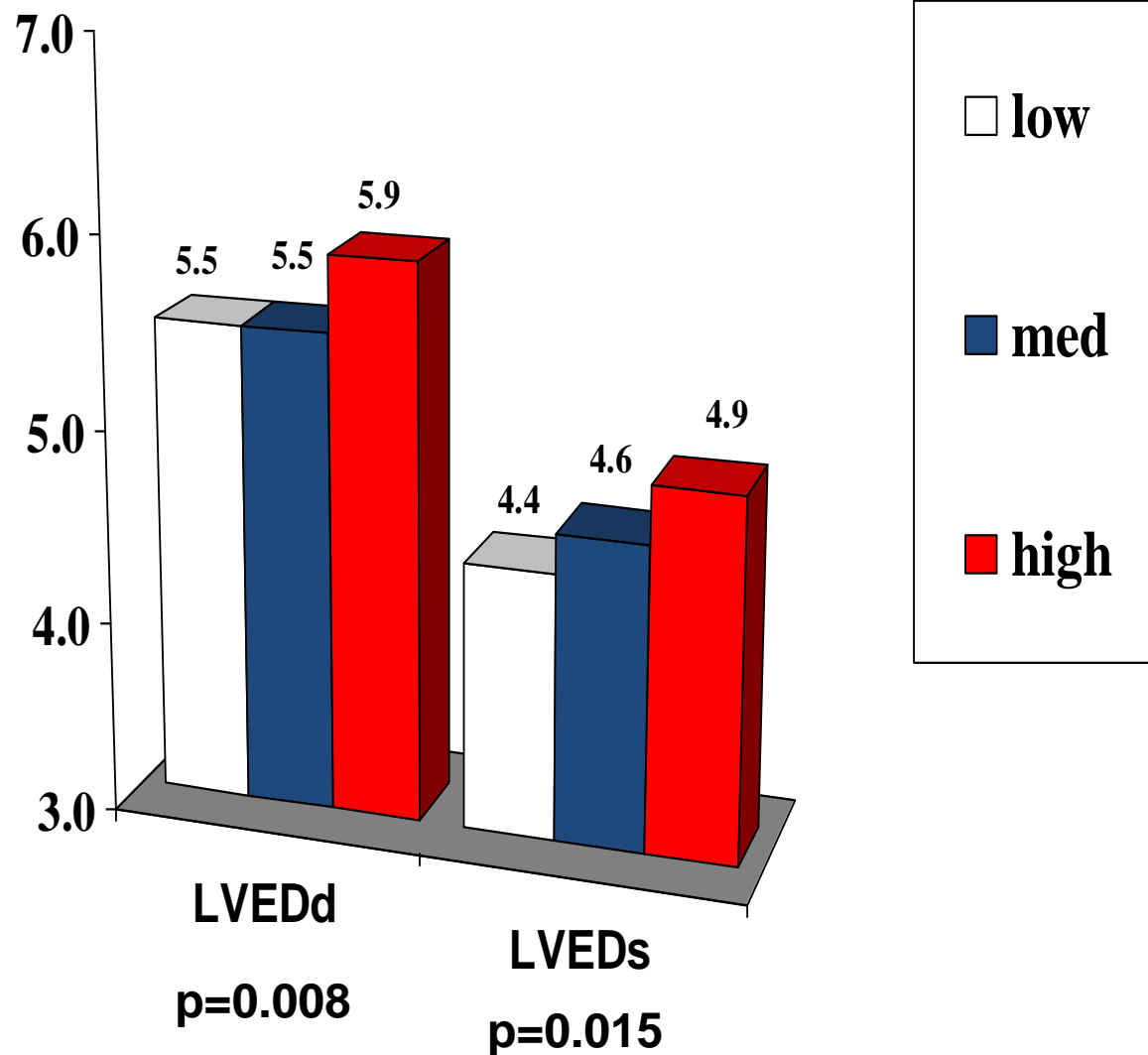
Black:  $p = 0.000001$   
Constant -47927.46  
 **$B1 = 2652$**

Non-Black:  $p = 0.000001$   
Constant -15989.013  
 **$B1 = 1354$**

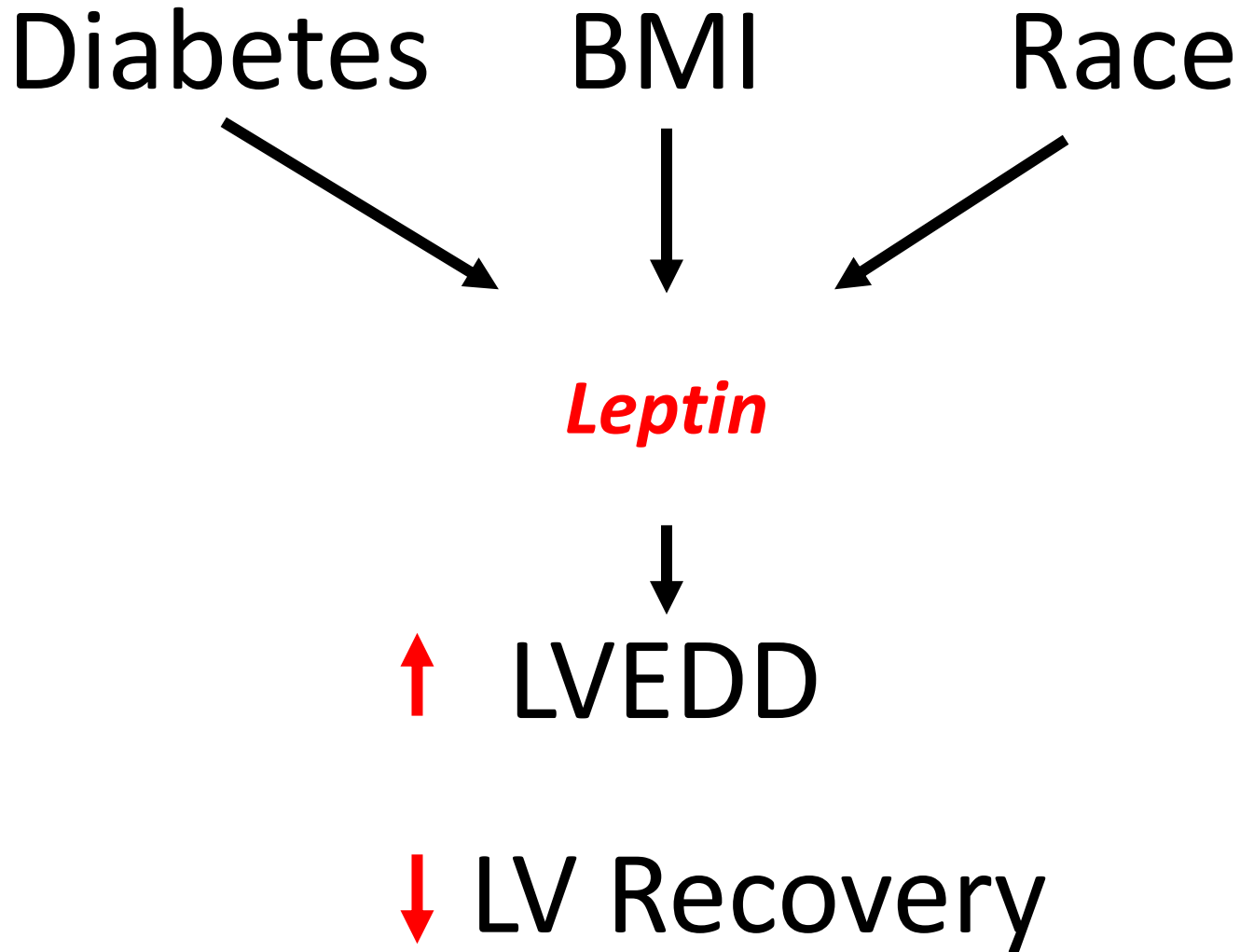
# Leptin by Race and Diabetes



# LVEDD and LVEDS IPAC subjects by Leptin tertiles



# Diabetes, BMI, Race and Recovery

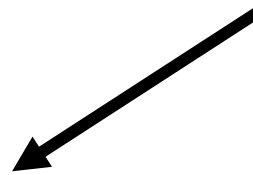
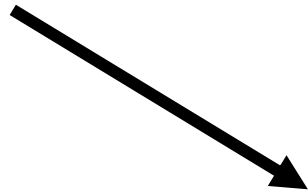


# Diabetes, BMI, Race and Recovery

Diabetes

BMI

Race



*Leptin*

*titin, sFlt1, 16Kd prolactin*



LVEDD



LV Recovery



# Remodeling in Peripartum Cardiomyopathy

- For women presenting with PPCM, the degree of remodeling (LVEDD) appears to predict potential recovery
- Race, BMI, Diabetes, all impact the degree of remodeling
- Interventions which prevent or limit remodeling should facilitate recovery



# Peripartum Cardiomyopathy Network (PCN)



- <http://www.peripartumcmnetwork.pitt.edu>
- [mcnamaradm@upmc.edu](mailto:mcnamaradm@upmc.edu)