

# Effect of Angina Under-recognition on Treatment in Outpatients with Stable Ischemic Heart Disease

Mohammed Qintar, MD

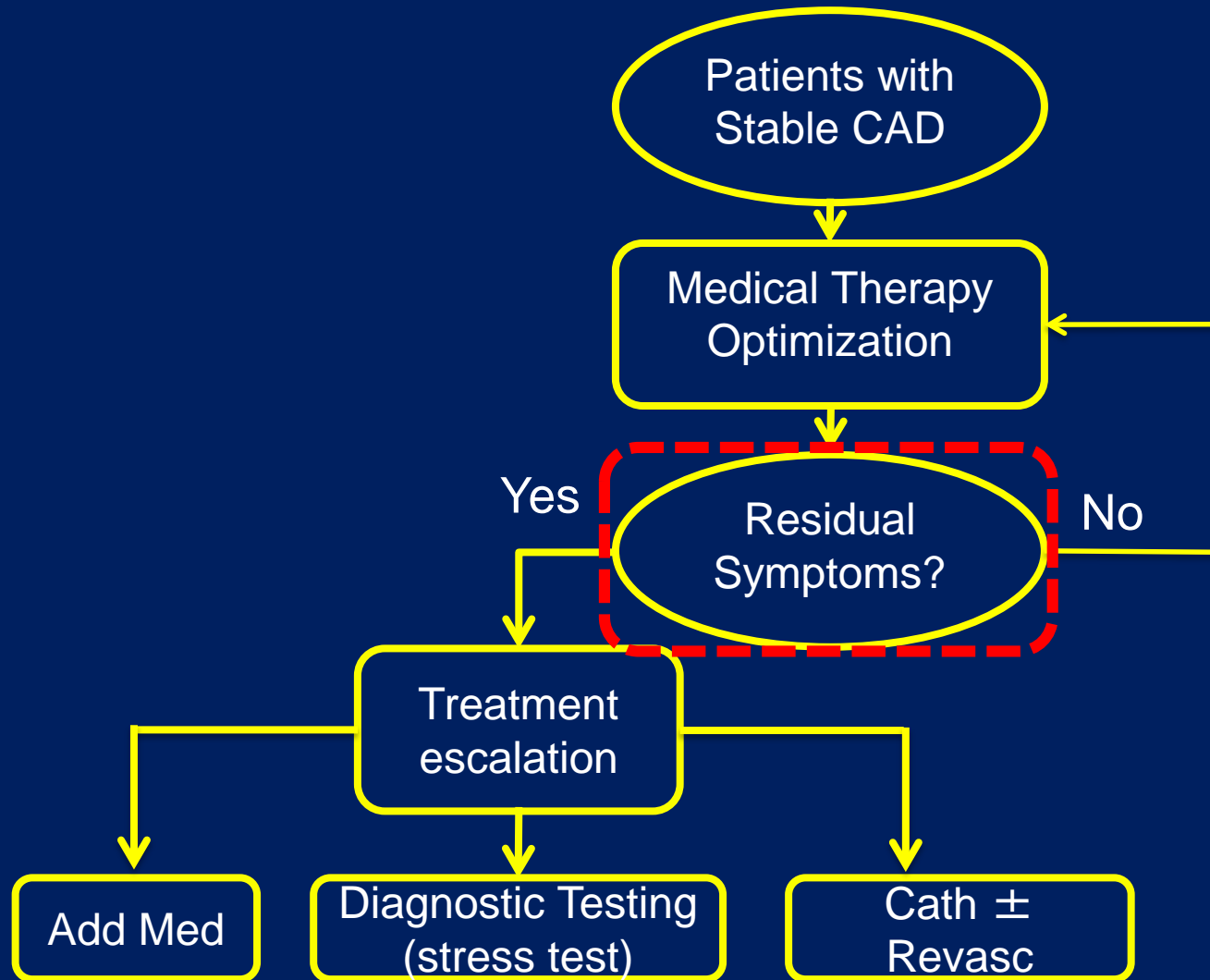
John A. Spertus, MD MPH, Kensey L. Gosch, MS, John Beltrame MD, Faraz Kureshi, MD MSc, Ali Shafiq, MD, Tracie Breeding, RN, Karen P. Alexander MD, Suzanne V. Arnold, MD MHA



# Disclosures

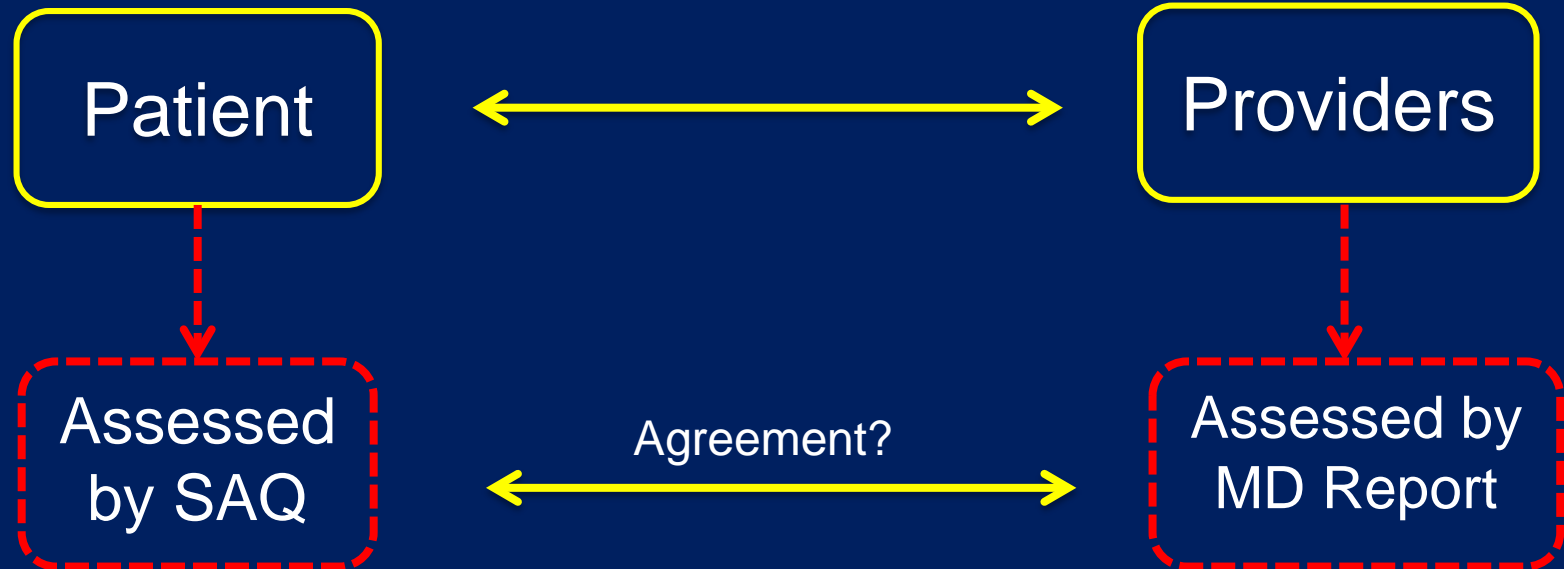
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- All others - None

# Importance of angina recognition



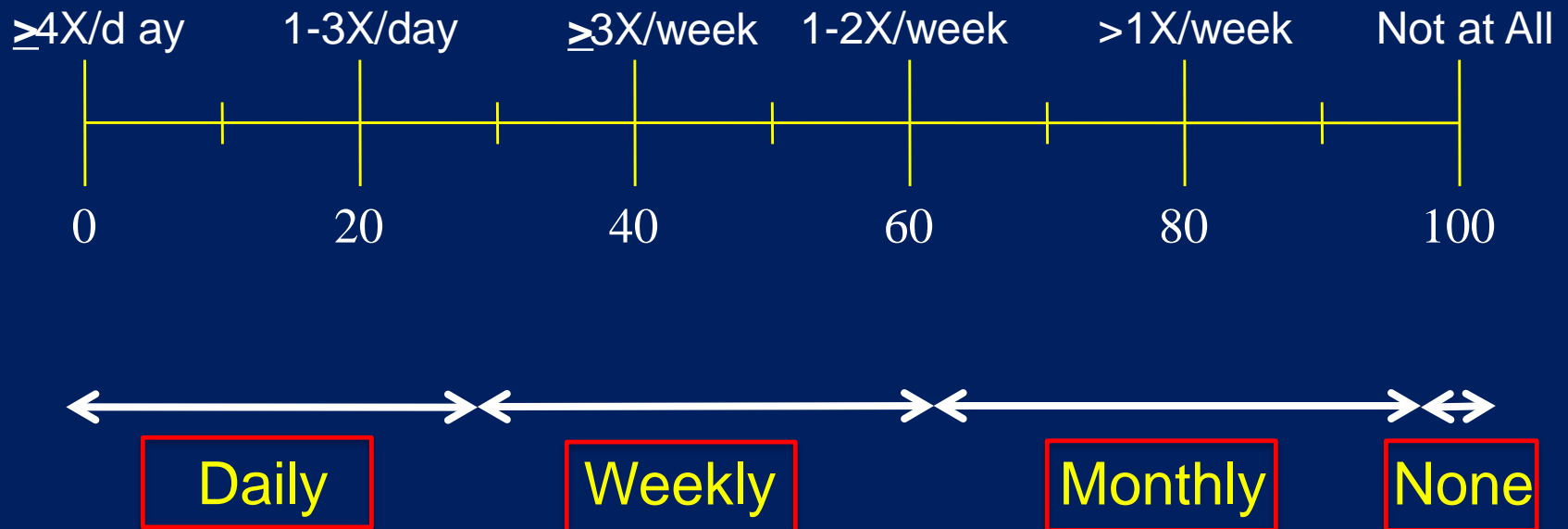
# Assessing angina by cardiologists

- The Angina Prevalence and Provider Evaluation of Angina Relief (APPEAR) involving 25 US outpatient cardiology practices
- Compare patient-reported and MD-reported angina



# Seattle Angina Questionnaire

- SAQ Angina Frequency domain



# Prior insights - Under-recognition of angina

- Overall agreement between patients and physicians...
  - kappa = 0.48
- Physicians reported no angina in...
  - 45% of patients reporting monthly angina
  - 26% of patients reporting daily/weekly angina
- The implications are unknown

# Objectives

- Study the implications of angina under-recognition on treatment escalation

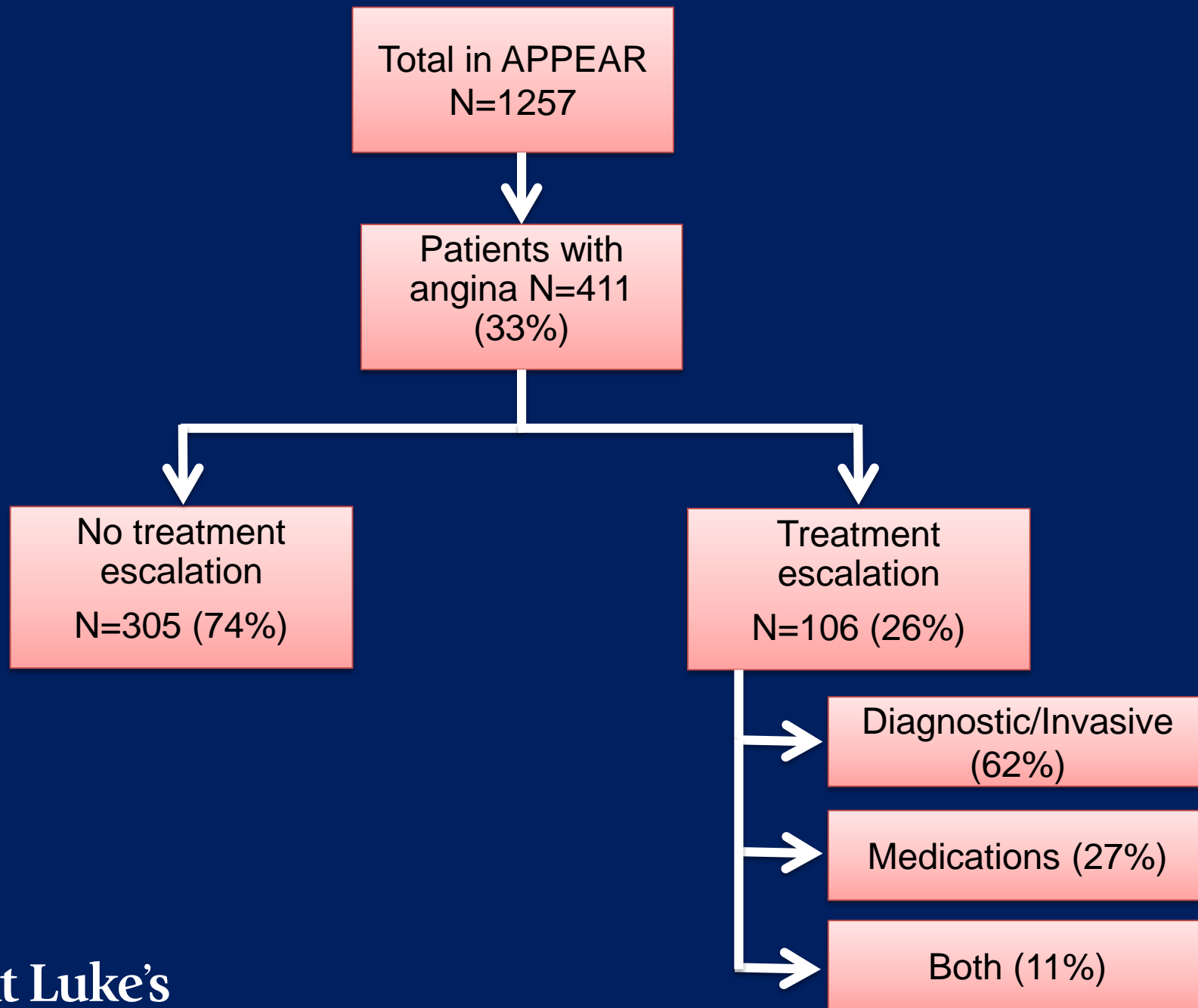
# Definitions

- Treatment escalation:
  - Intensification/addition of antianginal medications
  - Diagnostic/invasive tests:
    - stress test
    - coronary computed tomography angiography
    - coronary angiography
    - revascularization (percutaneous coronary intervention or bypass graft surgery)



# Statistical analysis

- Hierarchical multivariable logistic regression model
  - Physician and site as random effects
  - Variables included...
    - » Under-recognition on angina
    - » Age
    - » Gender
    - » Race
    - » Hx of CABG
    - » SAQ AS and SS
    - » On  $\geq$  antianginal med on arrival
    - » Physician specialty
    - » Avoidance of care due to cost

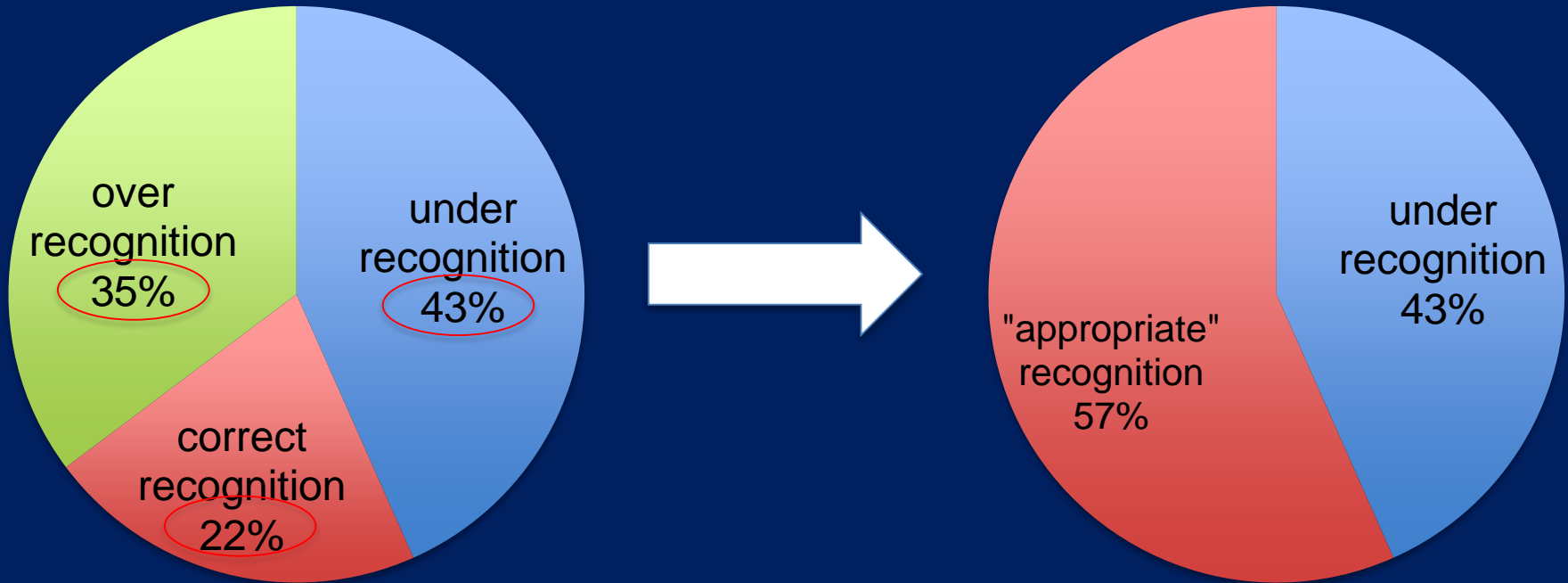


	<b>Treatment Escalation N=106</b>	<b>No Treatment Escalation N=305</b>	<b>P-value</b>
<b>Age (y) (mean)</b>	68	69	0.46
<b>History of HF</b>	10%	18%	0.057
<b>History of MI</b>	29%	41%	0.02
<b>History of PCI</b>	63%	55%	0.14
<b>History of CABG</b>	37%	29%	0.11
<b>On ≥2 antianginal meds</b>	43%	38%	0.36
<b>SAQ Angina Frequency</b>	70	75	0.01
<b>SAQ Angina Stability</b>	47	56	0.001
<b>SAQ Quality of Life</b>	57	64	0.001
<b>SAQ Treatment Satisfaction</b>	85	88	0.03
<b>SAQ Summary Score</b>	62	66	0.02

# Physicians Characteristics

	Treatment Escalation N=106	No Treatment Escalation N=305	P-value
Male	84%	86%	0.67
Practice years	20	20	0.99
Interventional cardiologist	31%	38%	0.20

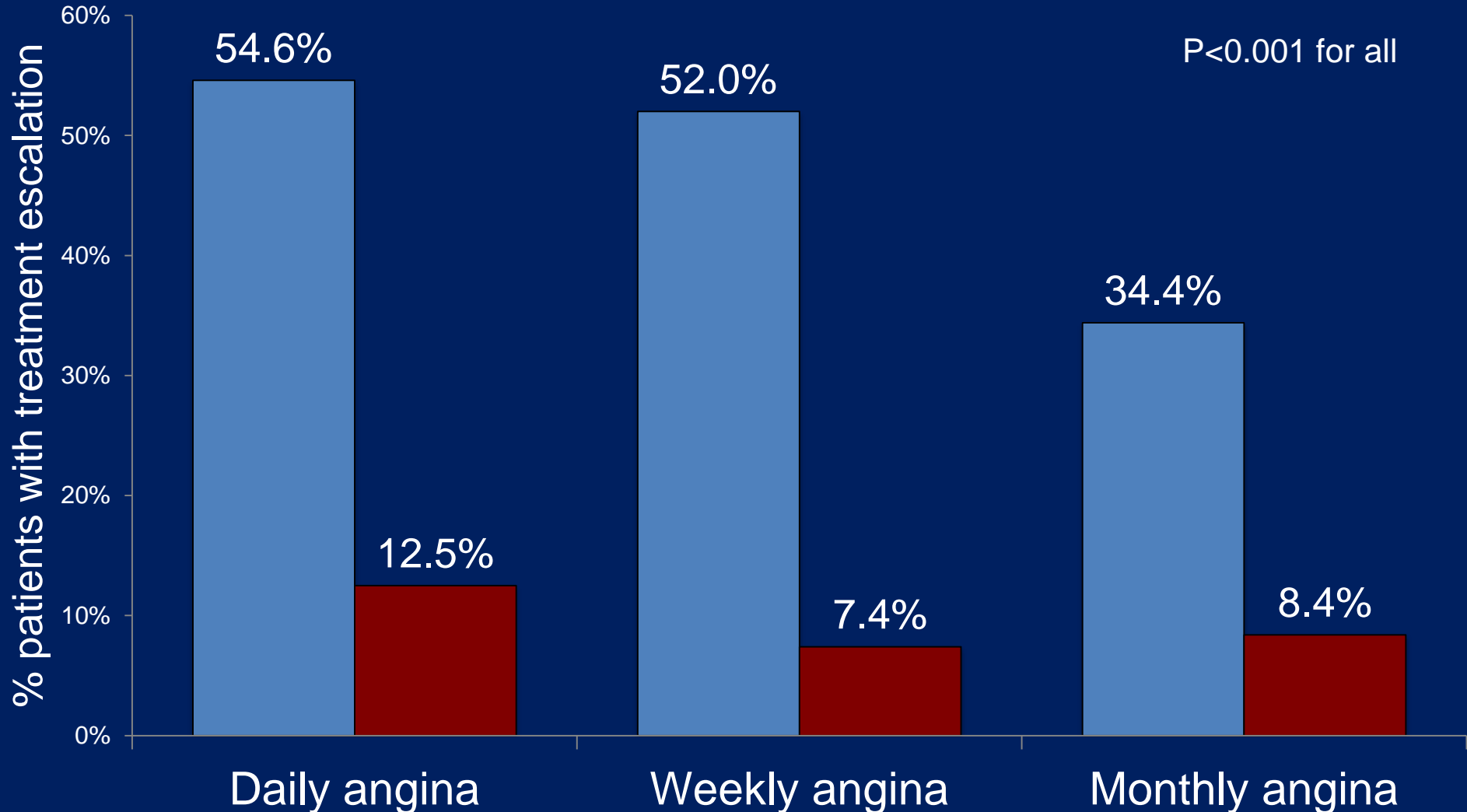
# Recognition of angina



- Correctly recognized and over-recognized angina had similar rates of treatment escalation ( $p=0.23$ )

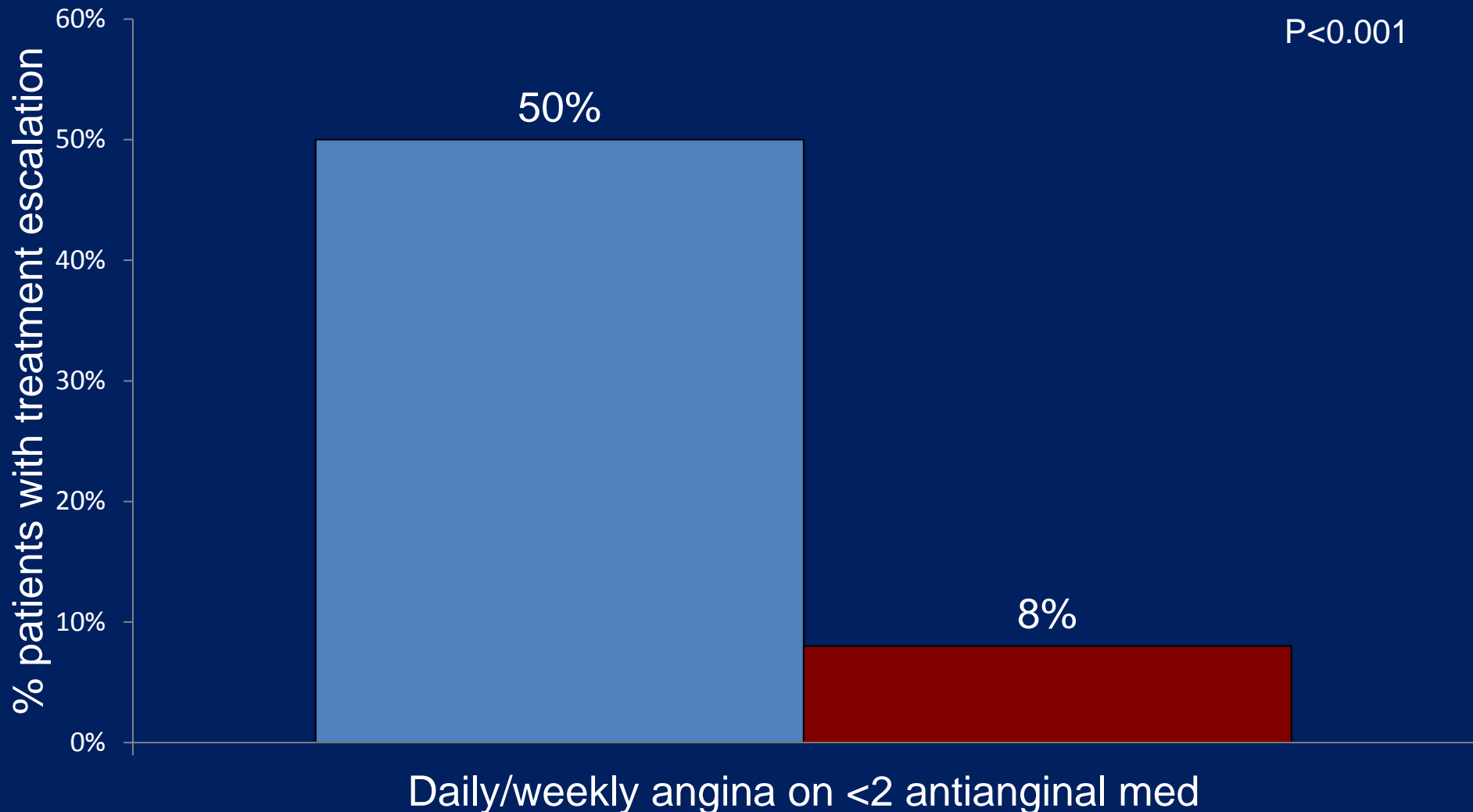
# Association of angina recognition with treatment escalation

■ Appropriate recognition of angina    ■ Under-recognition of angina



# Daily/Weekly angina on <2 antianginal medications

■ Appropriate recognition of angina ■ Under-recognition of angina



# Predictors of treatment escalation

	OR (95% CI)	P value
<b>Under-recognition of angina</b>	<b>0.10 (0.04-0.21)</b>	<b>&lt;0.001</b>
Age (per 5 years)	0.91 (0.79-1.04)	0.177
Male	1.04 (0.56-1.95)	0.889
White race	0.39 (0.14-1.07)	0.066
Self-reported avoidance of care due to cost	0.60 (0.20-1.83)	0.365
History of coronary bypass graft surgery	1.16 (0.59-2.27)	0.662
SAQ Angina Stability (per 25 point decrease)	1.32 (0.96-1.82)	0.087
SAQ Summary Score (per 10 point decrease)	0.96 (0.87-1.05)	0.358
On $\geq 2$ antianginal medications on arrival	1.17 (0.61-2.22)	0.642
Physician specialty: interventional cardiology	1.09 (0.51-2.34)	0.827



# Limitations

- Cross sectional study
- No follow up information on health status or clinical outcomes
- Physicians were aware of study

# Conclusions

- Under-recognition of angina is common
- Under-recognition is strongly associated with a lack of treatment escalation
  - Patients with under-recognized angina were 10-fold less odds to get treatment escalation

# Future directions

- Develop novel strategies to improve angina recognition
  - Study implementation of patient-reported outcome measures (e.g. SAQ) in cardiology outpatient practice
- Test the impact of improved recognition on PRO and clinical outcomes

# Acknowledgments

- Many thanks to my mentors at MAHI for their great support

Thank you!

# SAQ AF with angina diary and SL NTG

## Original Article

### **Development and Validation of a Short Version of the Seattle Angina Questionnaire**

Paul S. Chan, MD, MSc; Philip G. Jones, MS; Suzanne A. Arnold, MD; John A. Spertus, MD, MPH

## Original Article

### **Comparison of the Seattle Angina Questionnaire With Daily Angina Diary in the TERISA Clinical Trial**

Suzanne V. Arnold, MD, MHA; Mikhail Kosiborod, MD; Yan Li, PhD; Philip G. Jones, MS; Patrick Yue, MD; Luiz Belardinelli, MD; John A. Spertus, MD, MPH

# Physician form

**In the past 4 weeks, has the patient had chest pain, angina or angina-equivalent symptoms?**    Yes    No

## COMPLETE ONLY FOR SYMPTOMS OCCURRING IN THE PAST 4 WEEKS

*Category (check one only):*

- Typical angina
- Atypical angina/angina equivalent
- Non-cardiac chest pain

*Frequency of symptoms (check one only):*

- Daily       Monthly
- Weekly       Less than monthly

# Variability among physicians

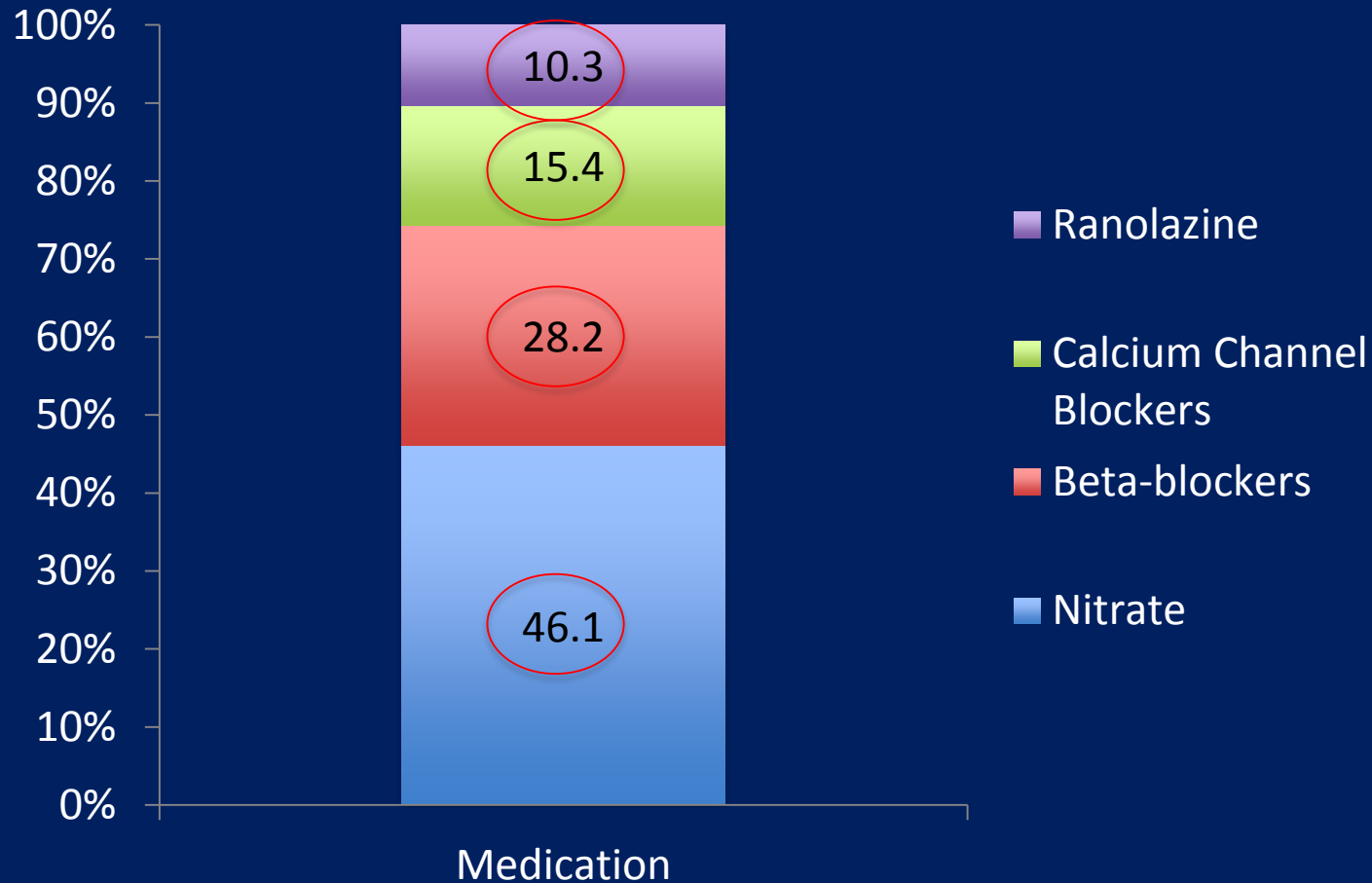
- After adjusting for clinical characteristics and physicians' under-recognition rates
- The median odds ratio for variability across physicians was **1.96** ( $p=0.010$ )
- The odds of treatment escalation varies, on average, 2-fold between two randomly selected physicians seeing statistically similar patients.



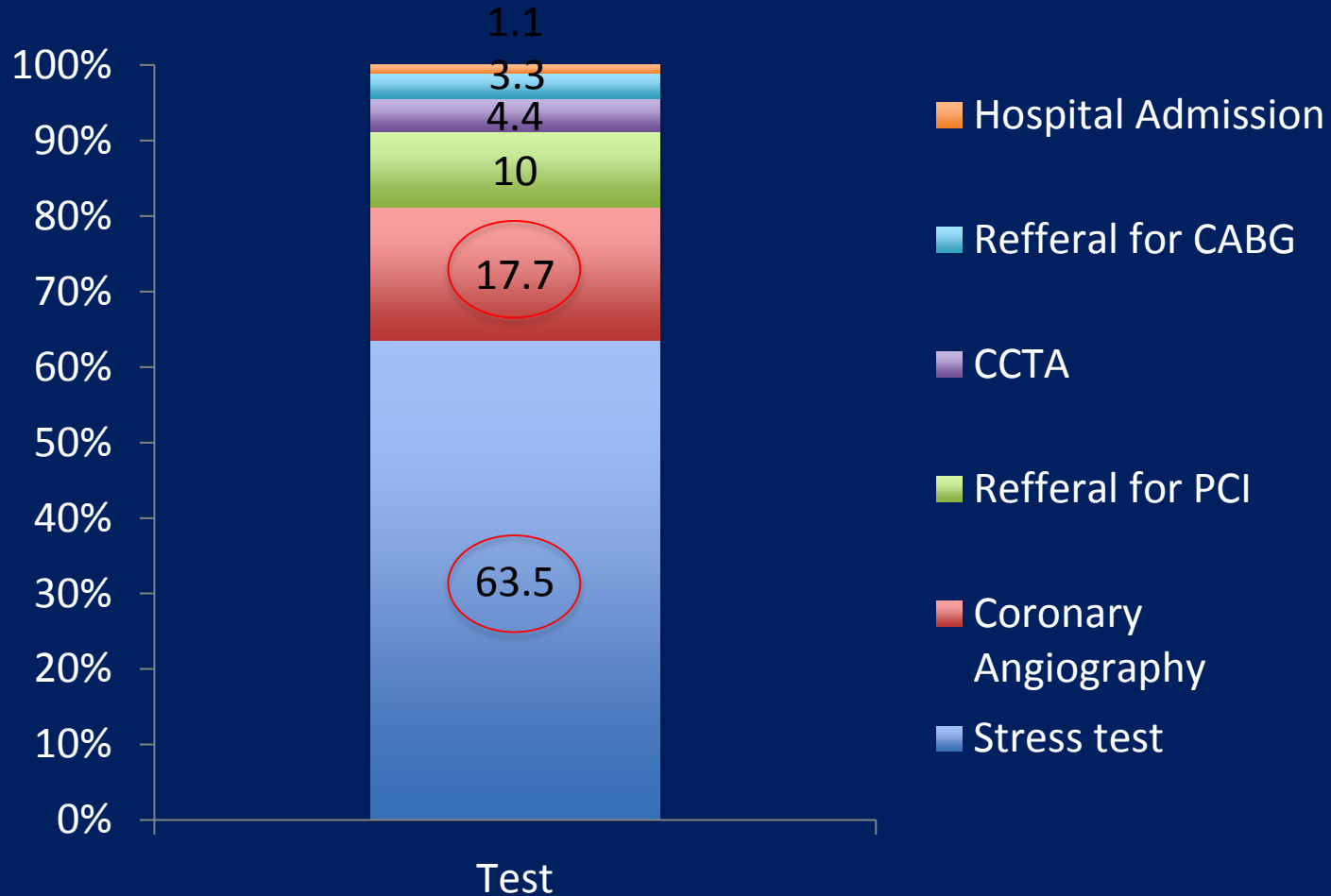
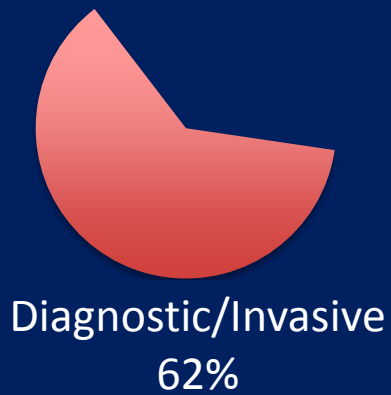
# Reasons not to escalate treatment

	Treatment Escalation N=106	No Treatment Escalation N=305	P-value
Systolic BP	128.8 ± 19.7	125.8 ± 16.9	0.126
Systolic BP (Median (IQR))	127.0 (116.0, 142.0)	124.0 (114.0, 136.0)	0.088 W
Diastolic BP	72.2 ± 11.3	71.4 ± 10.7	0.518
Diastolic BP (Median (IQR))	70.0 (64.0, 80.0)	70.0 (64.0, 79.0)	0.432 W
Heart rate	70.3 ± 10.9	73.4 ± 54.7	0.566
Heart rate (Median (IQR))	68.5 (63.0, 79.0)	70.0 (62.0, 78.0)	0.958 W
Insurance for medications	102 ( 97.1% )	291 ( 96.0% )	0.768
Avoid care due to cost (Occasionally or more often)	8 ( 7.5% )	30 ( 9.9% )	0.472

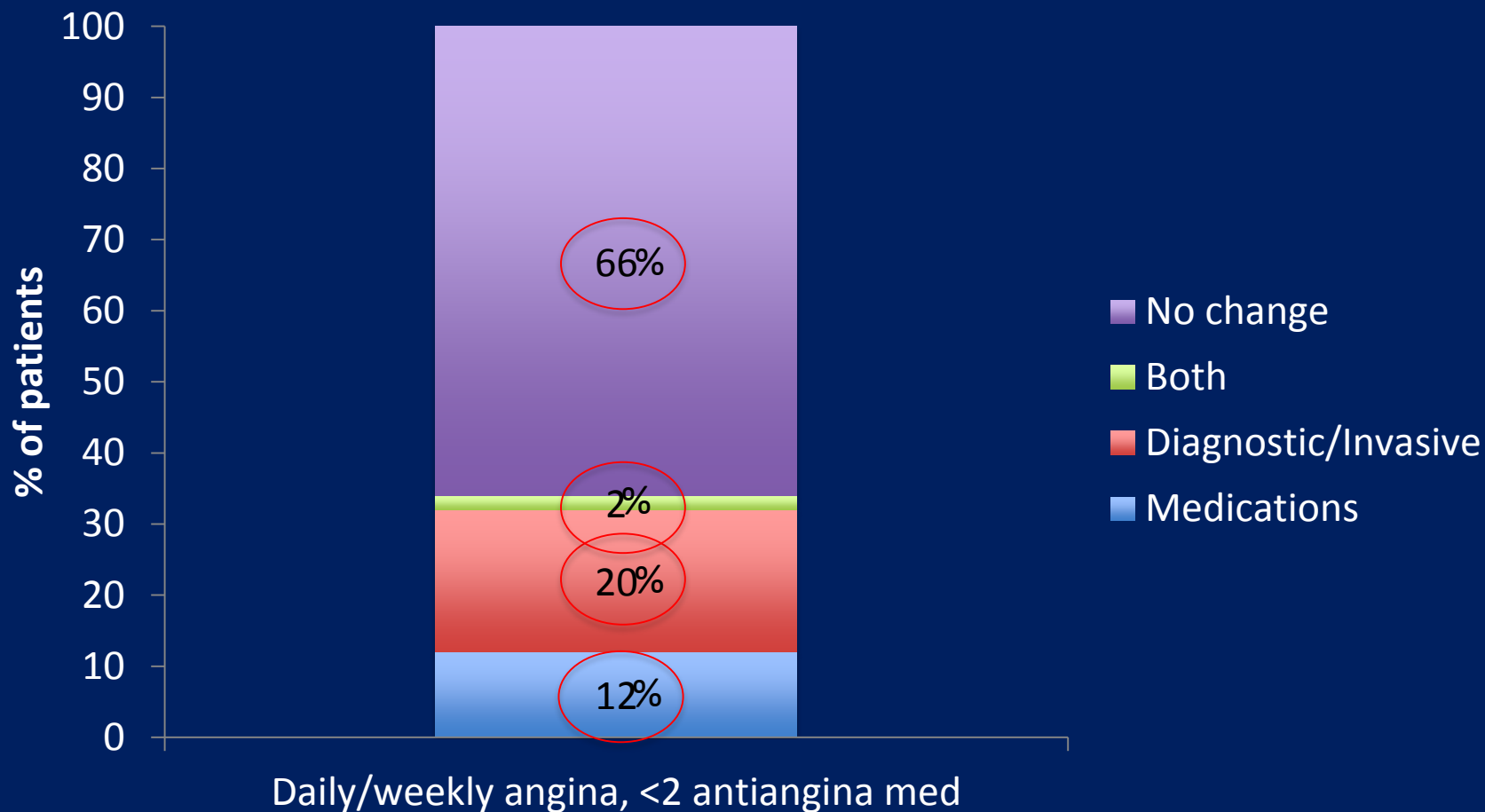
# Treatment Escalation - Medications



# Treatment Escalation – Diagnostic/Invasive tests



# Treatment escalation for daily/weekly angina on <2 anti-angina medications



N=42