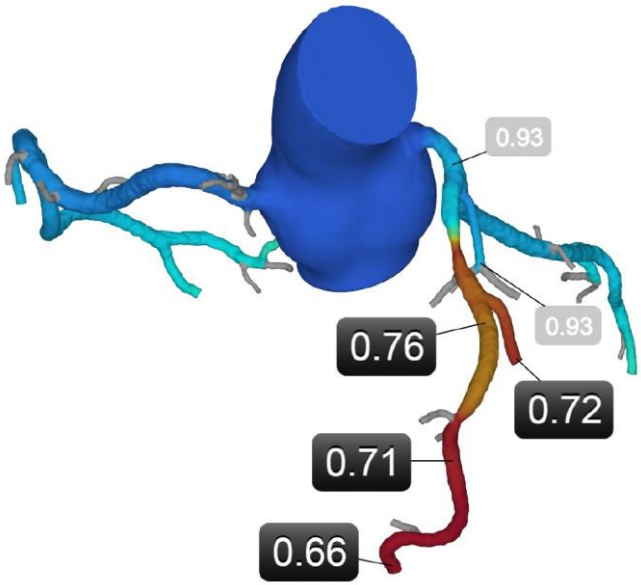
Coronary CTA is the Test of Choice for Acute Chest Pain



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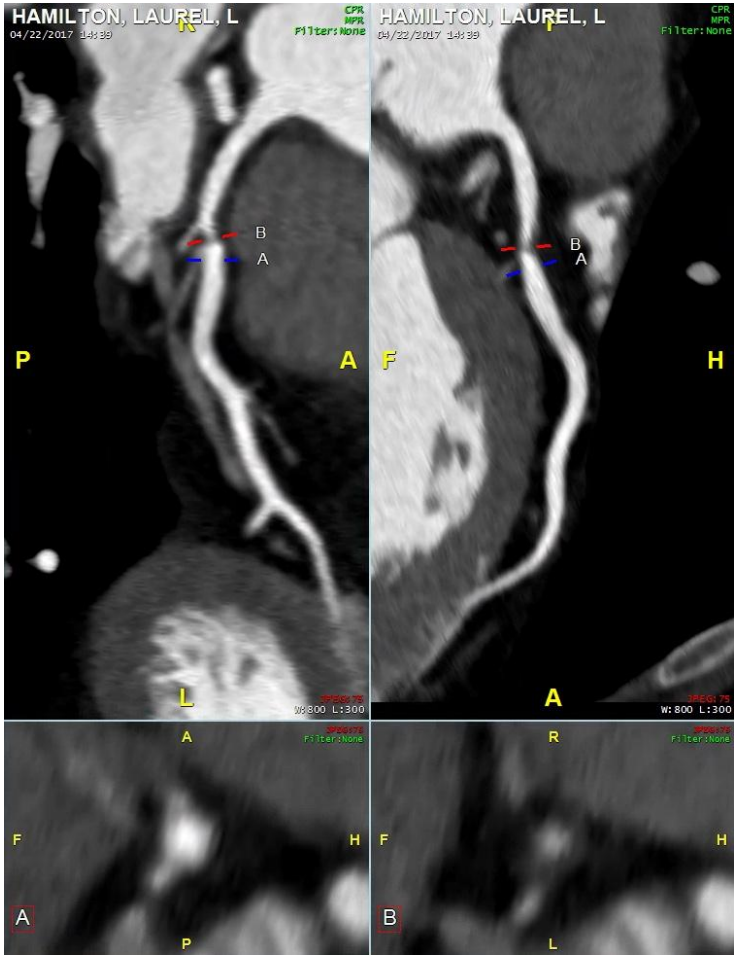
Disclosure

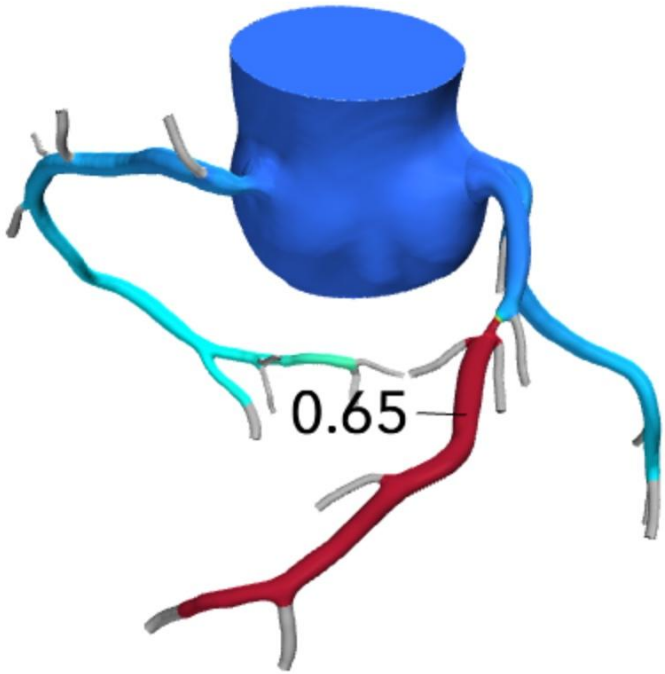
- Research grant: HeartFlow Inc.

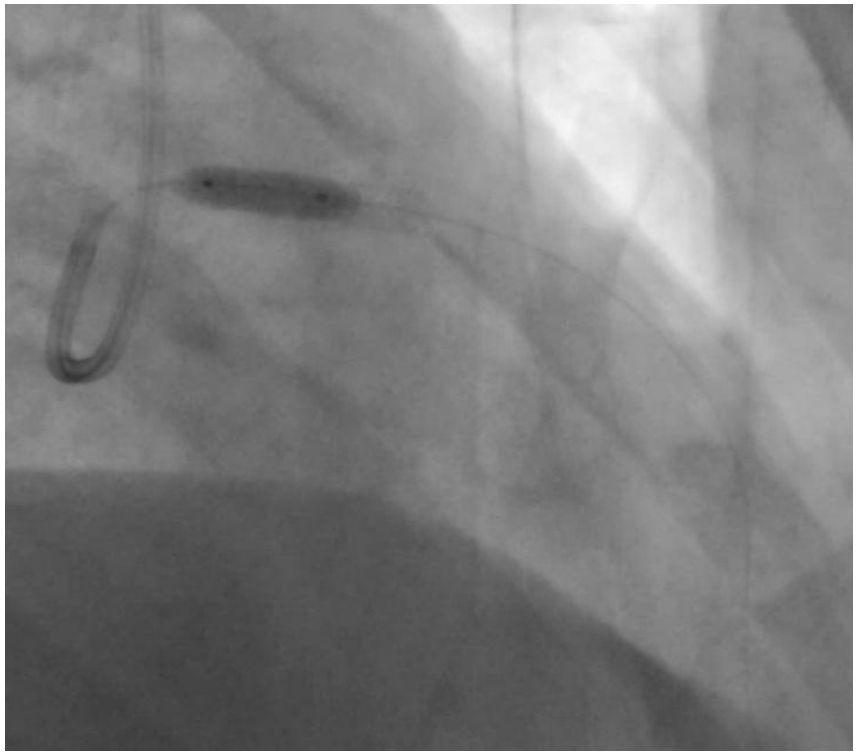
Does negative Calcium score exclude ACS?

- 61 yo Female
- 4/24/17 ED visit, DM, lipids, HTN
- 2 wks recurrent substernal “tight” CP
- EKG, Trop neg

Calcium Score: Zero



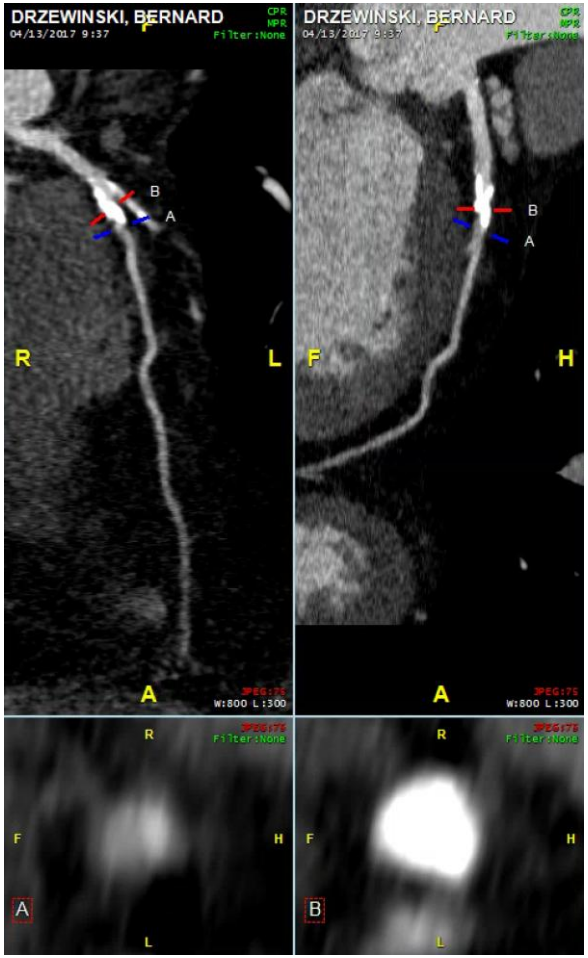


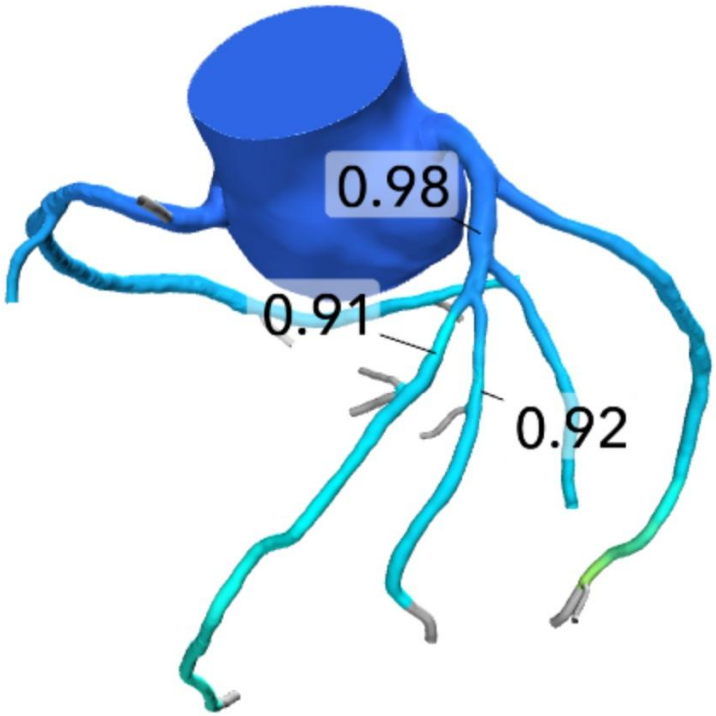


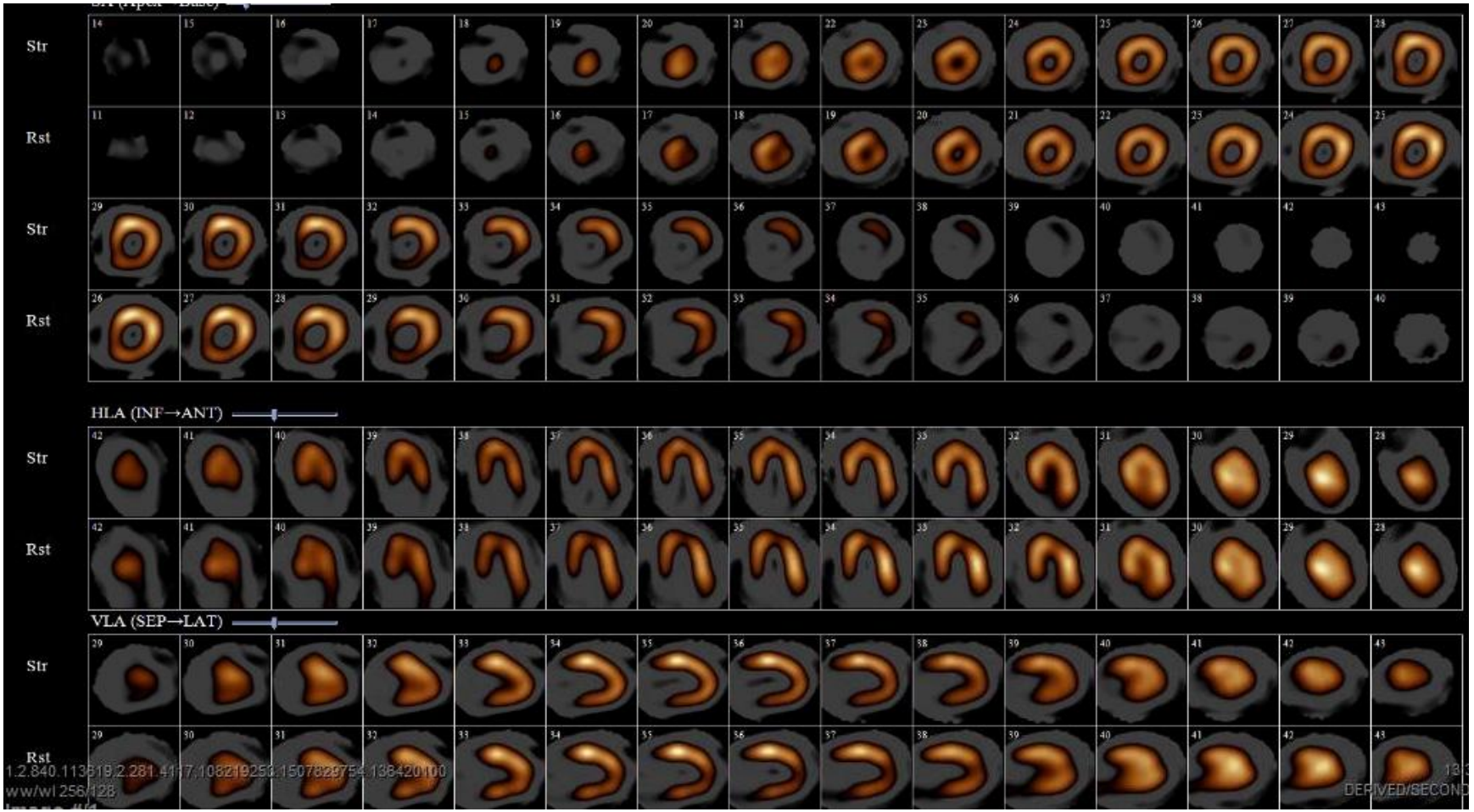
Does positive Calcium score indicate ACS in ACP?

- 75 yo Male
- ED visit 4/13/17 HTN, lipids,COPD
- 3/10 “pressure”CP1-2 hrs,
- neg EKG, neg Tn

Severe coronary calcification – completely covers lumen 100%






Str
Rst
Str
Rst
HLA (INF→ANT)
Str
Rst
VLA (SEP→LAT)
Str
Rst
DERIVED/SECOND

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Findings:
Lexiscan Test Interpretation: The patient completed a Lexiscan protocol without reports of chest discomfort. Blood pressure was normal. Resting EKG showed sinus rhythm a right bundle branch block pattern. During the study there were no electrocardiographic changes diagnostic of ischemia. No ectopy was detected.

Nuclear Analysis: Perfusion images following both rest and stress appeared normal.

Gated Analysis: Gated images were done to evaluate resting perfusion abnormalities to correlate wall motion. The calculated ejection fraction was 72%. There was normal thickening in all regions. There was no motion artifact.

Impression:
Clinical response: Nonischemic
EKG response: Nonischemic
Nuclear response: Nonischemic

Coronary CTA is the Test of Choice for Appropriately Selected Patients with Acute Chest Pain

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Coronary CTA is the Test of Choice for Appropriate Patients with ACP

such as:

Patients with True Positive hs-Tn

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Coronary CTA is the Test of Choice for Appropriate Patients with ACP

such as:

Patients with True Positive hs-Tn

and

Patients with False Positive hs-Tn

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Coronary CTA is the Test of Choice for Appropriate Patients with ACP

such as:

Patients with True Positive hs-Tn

and

Patients with False Positive hs-Tn

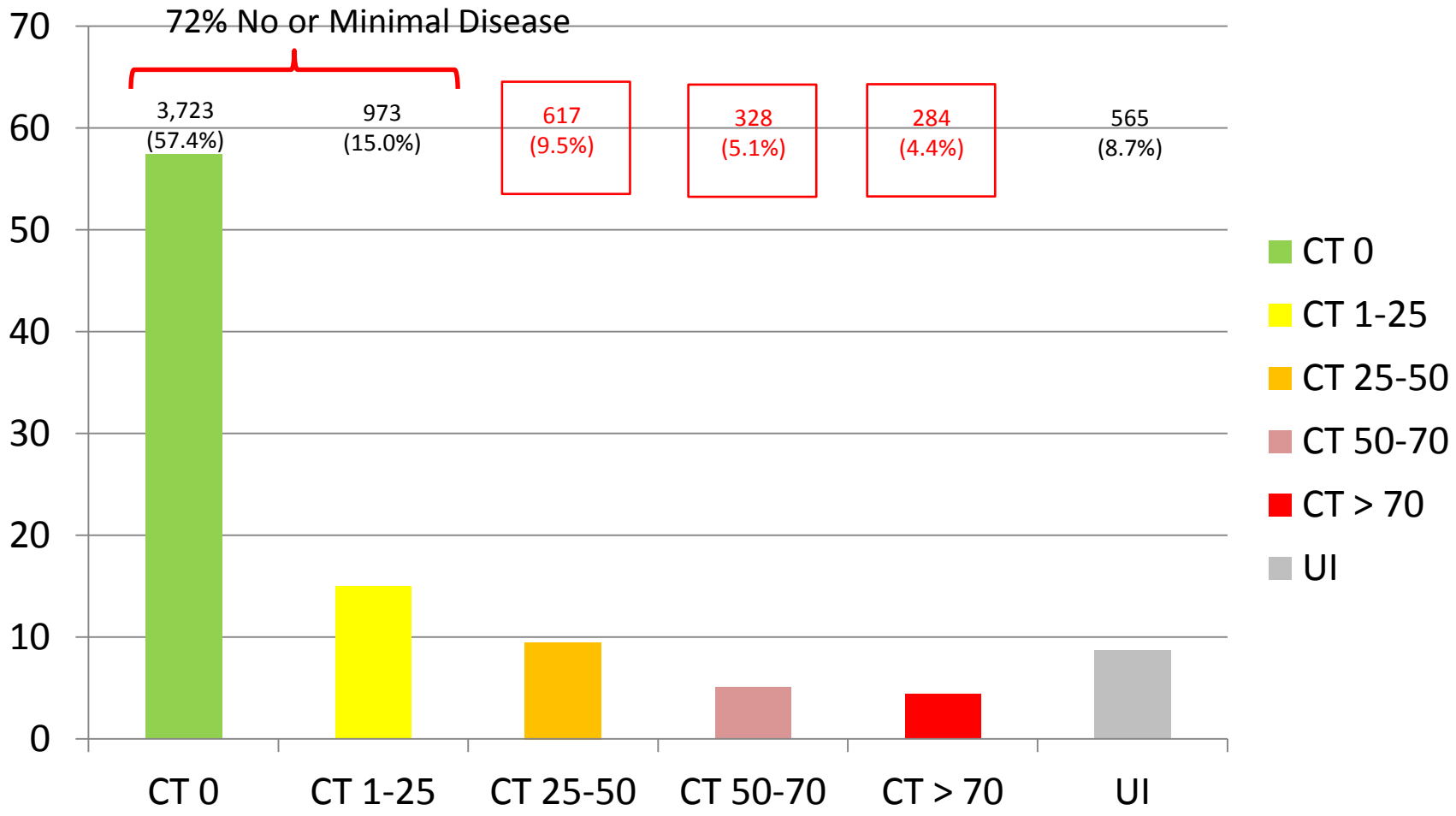
and

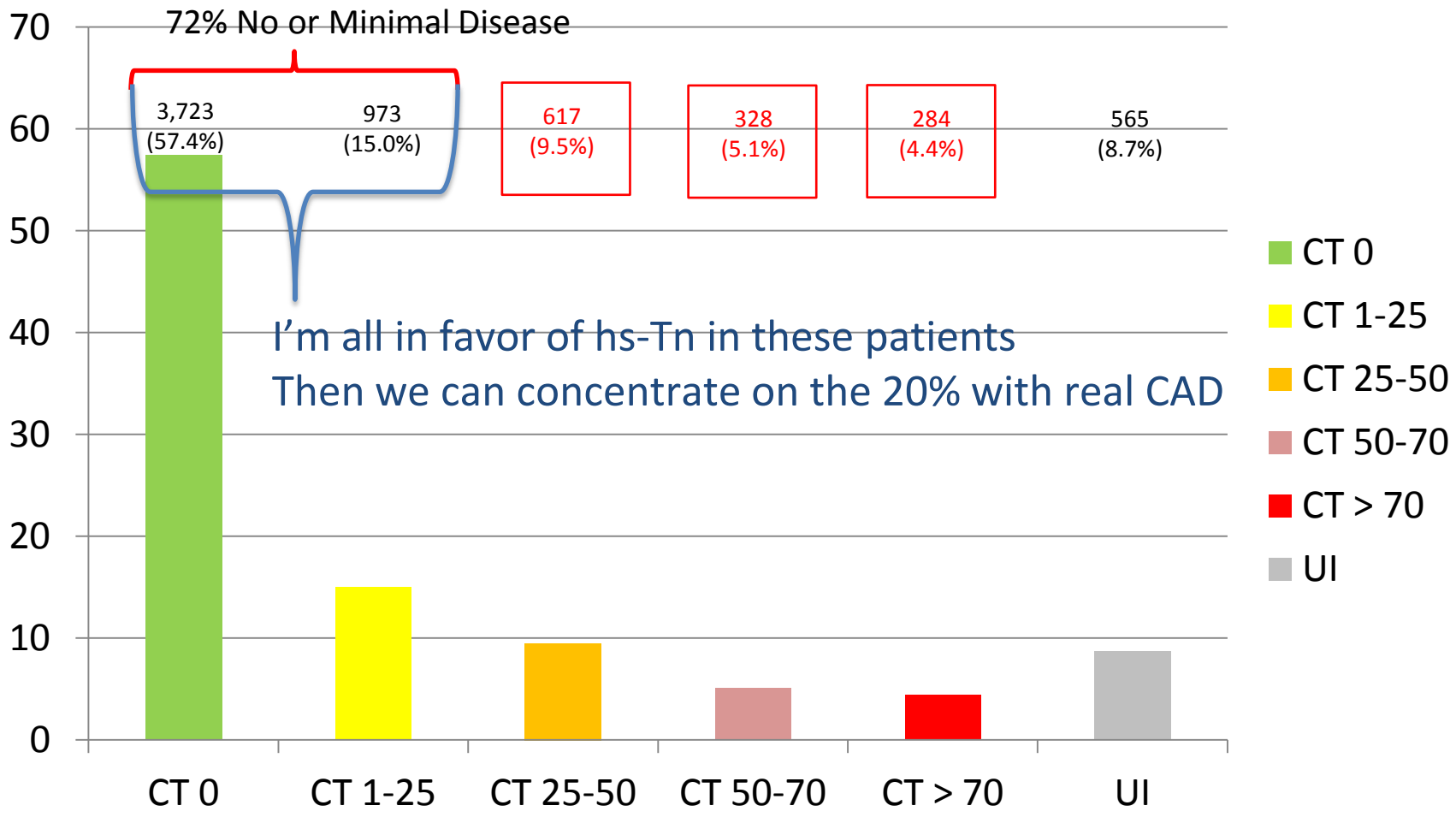
Patients with Equivocal hs-Tn

When hs-Tn is positive, who are you gonna call?

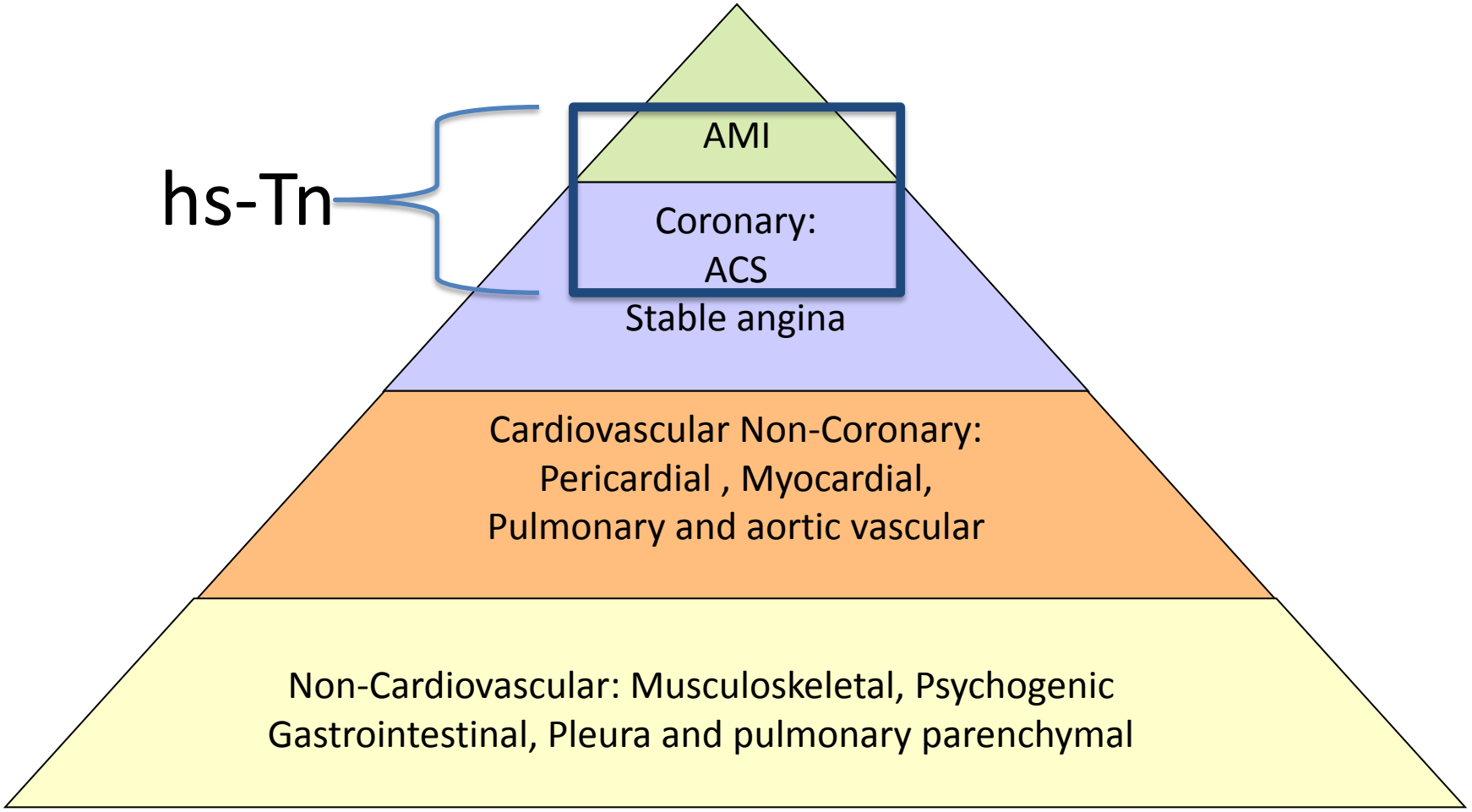
- Stress testers?
- Cath testers?
- CCTA testers?

Beaumont 10 Yr ED Experience: Distribution of CAD by CCTA Stenosis Severity (N=6,490)

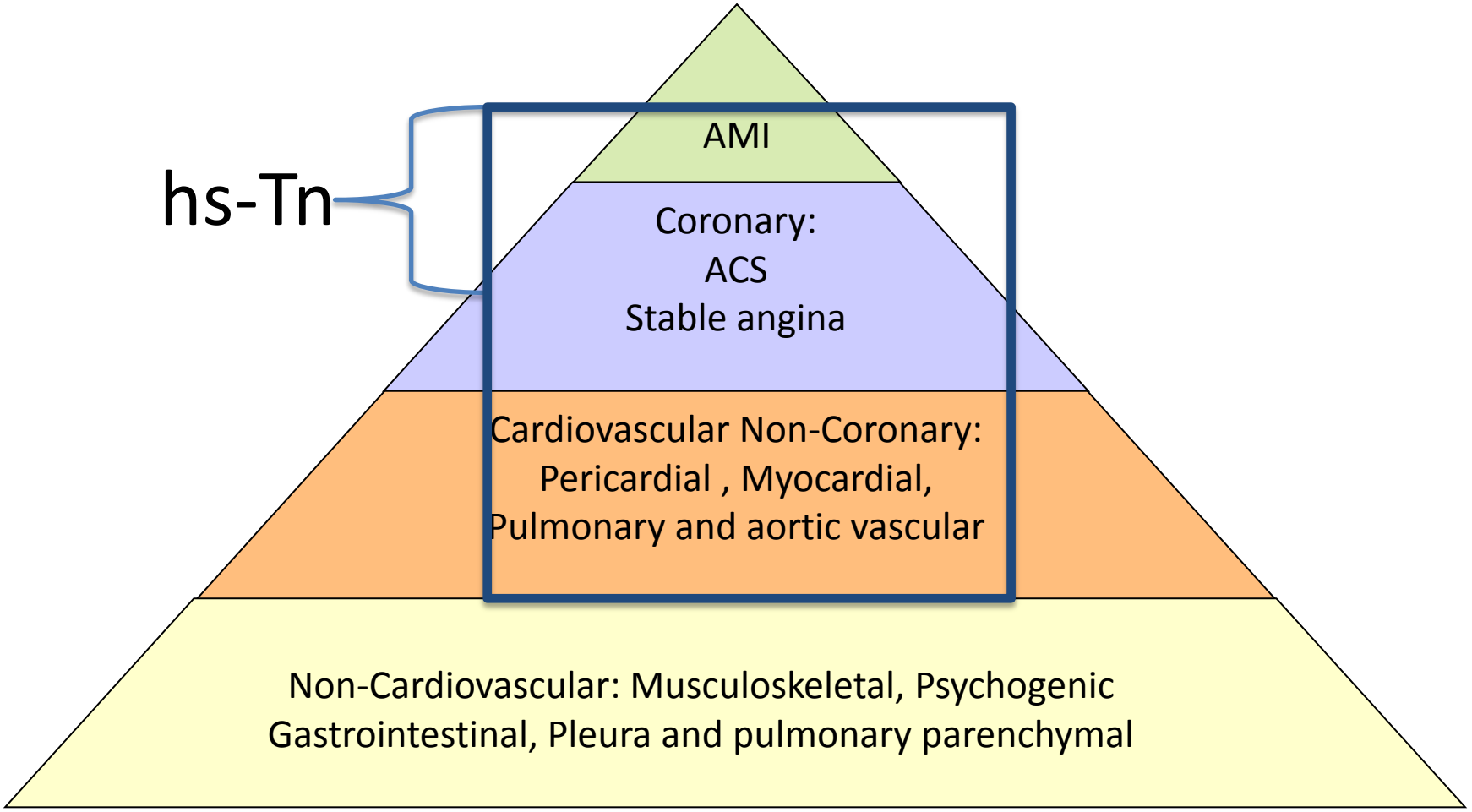



72% No or Minimal Disease
70
60
50
40
30
20
10
0
3,723
(57.4%)
973
(15.0%)
617
(9.5%)
328
(5.1%)
284
(4.4%)
565
(8.7%)
I'm all in favor of hs-Tn in these patients
Then we can concentrate on the 20% with real CAD
CT 0
CT 1-25
CT 25-50
CT 50-70
CT > 70
UI
CT 0
CT 1-25
CT 25-50
CT 50-70
CT > 70
UI

Potential advantage: neg hsTn may exclude ACS and avoid CTA altogether



Potential dis-advantage: hs-Tn may be false positive in host of other conditions.



Potential Advantages CTA vs Stress tests: Efficiency and Cost

Multicenter Trial Evidence - Efficiency

- CT-STAT
  - 54% reduction in time to diagnosis
  - 38% cost savings
- ACRIN-PA 4005
  - LOS 18 hrs CCTA vs. 25 hrs usual care
    - Negative testing: 12 vs. 25 hrs
  - 50% vs. 23% direct ED discharge
- ROMICAT II
  - LOS 22 hrs CCTA vs. 31 hrs usual care
  - 47% vs. 12% direct ED discharge
  - ED visit cheaper in CCTA: $2053 vs. $2532
  - Hospital costs more in CCTA: $1950 vs. $1297
  - Overall care similar: $4004 vs. $3828

How does CCTA perform if hs-Tn is available? – The BEACON Trial

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Coronary CT Angiography for Suspected ACS in the Era of High-Sensitivity Troponins

Randomized Multicenter Study

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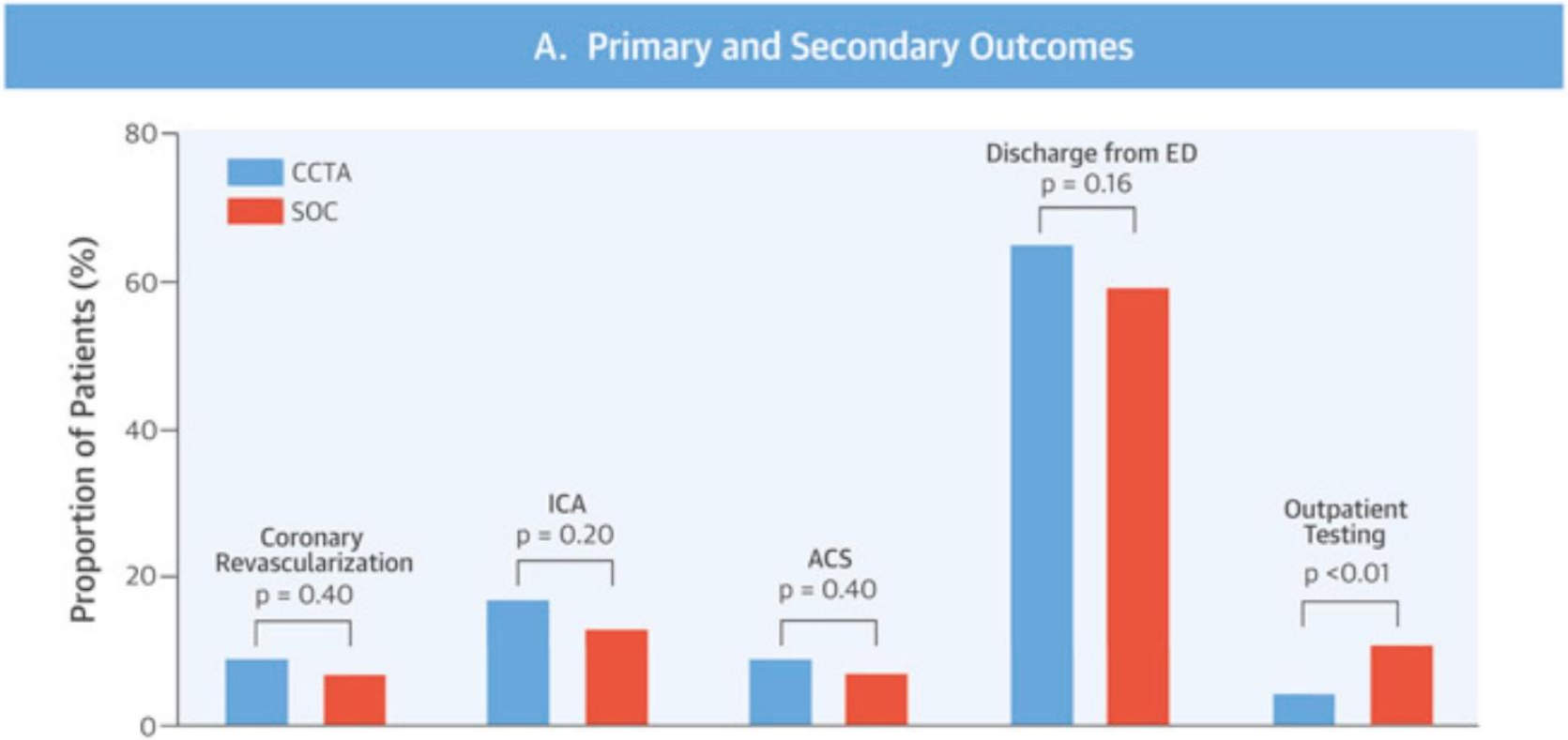

An attractive consequence of early CCTA in our study was the reduced number of subsequent outpatient testing and lower medical costs at 30 days.

- Late outpatient testing was reduced with CCTA, because even if neg hs-Tn don’t have ACS, they still may have angina and need a correct diagnosis. Evaluation was deferred…not eliminated in hs-Tn neg pts. For deferred testing, I still think CCTA is the best choice.

Summary

- It is hard for me to understand use of CAC alone in ACP
- hs-Tn is a valuable addition to ED diagnosis.
- It may reduce the need for CCTA in many cases.
- However, when positive or equivocal, further evaluation is needed.
- In many cases, negative hs-Tn will need outpt non-invasive evaluation since hs-Tn did not provide explanation for their Sx, even if it was not ACS.
- The proven advantages of CCTA over other diagnostic strategies are still compelling.