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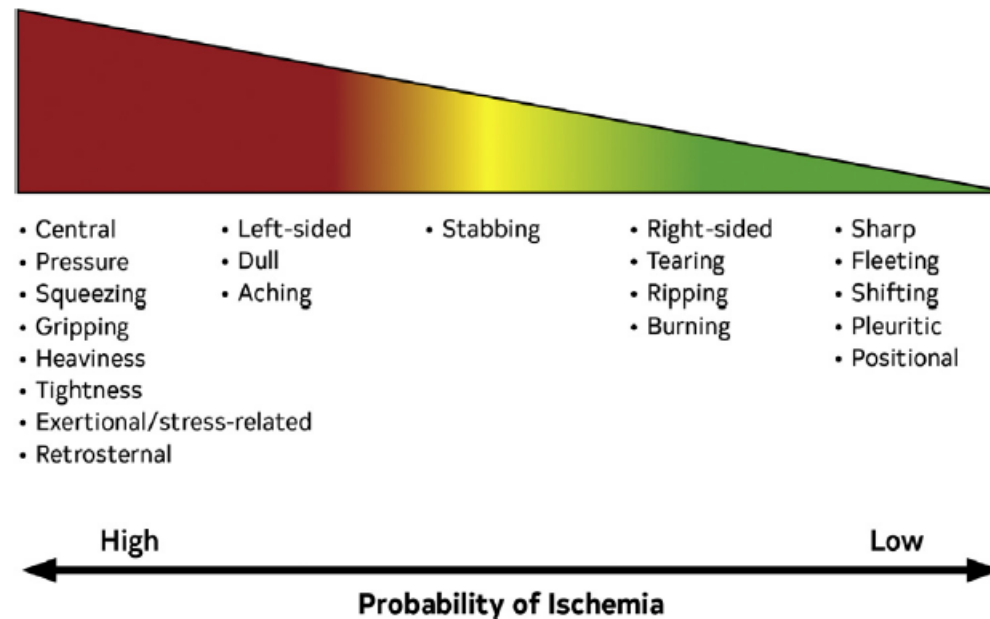
Interventional Cardiology

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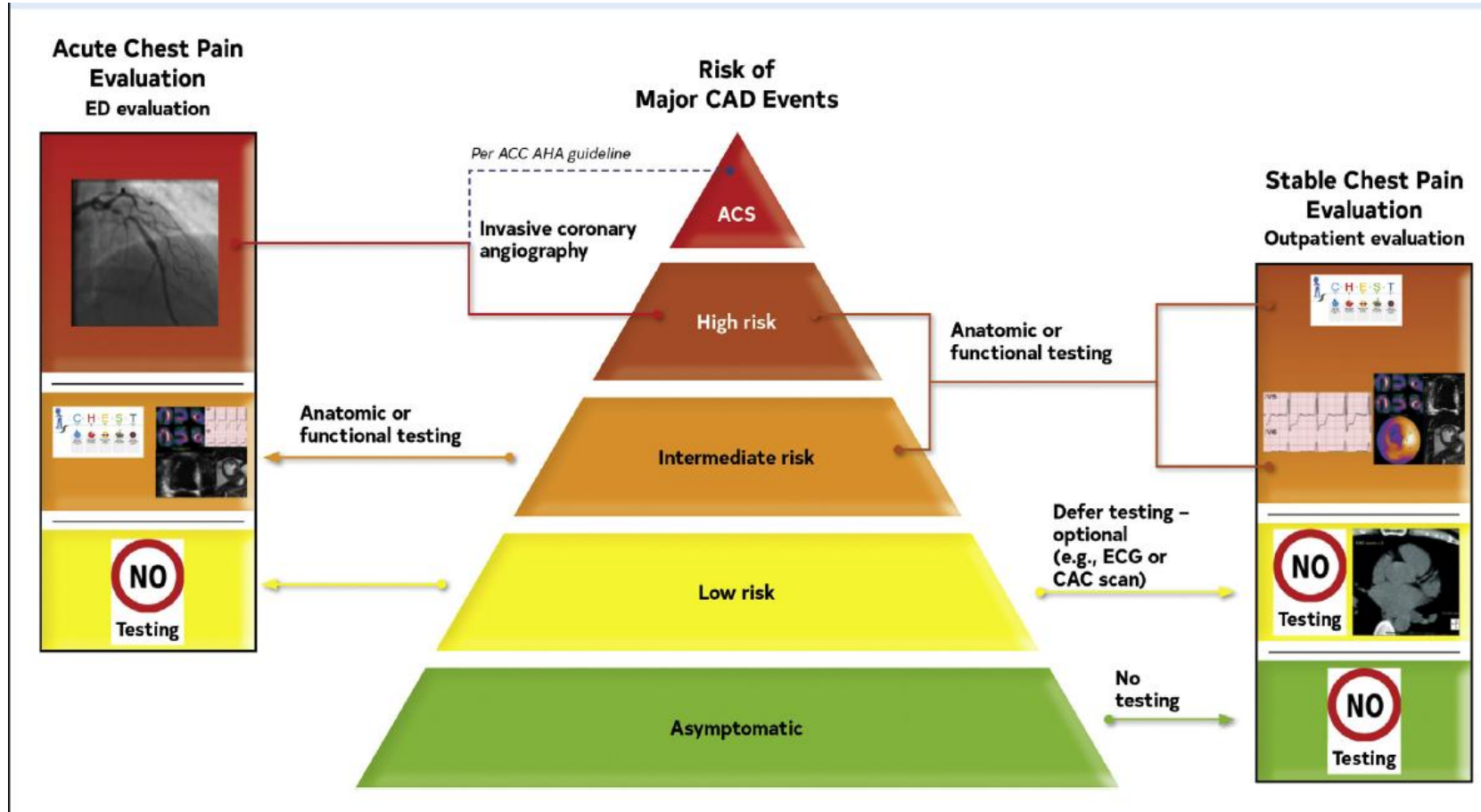
Disclosure

- No relevant industry or financial conflicts
- Portions of this presentation were developed with the assistance of artificial intelligence tools for drafting, formatting, and content organization. All information, analyses, interpretations, and conclusions were independently reviewed, verified, and approved by the presenter, who assumes full responsibility for the accuracy and content of this presentation.

2021 Chest pain guidelines

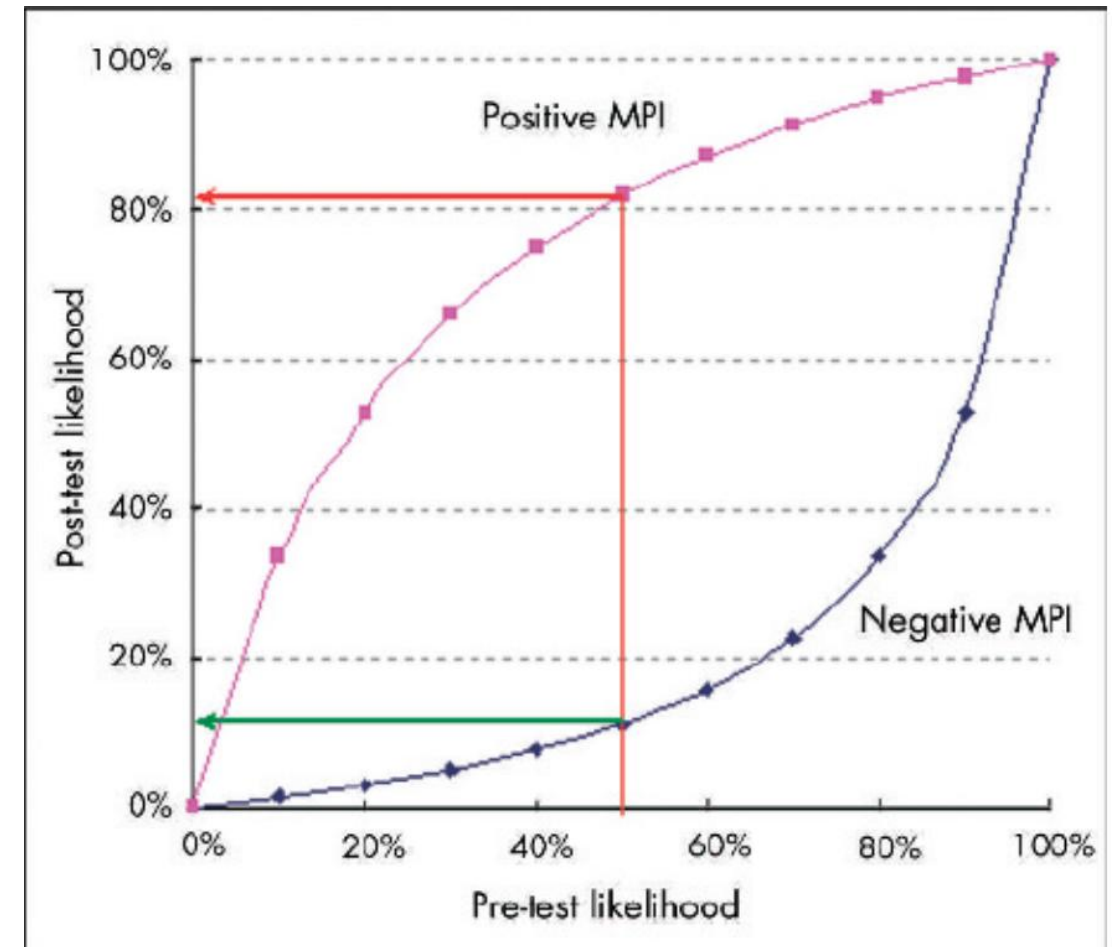


Its all About Risk

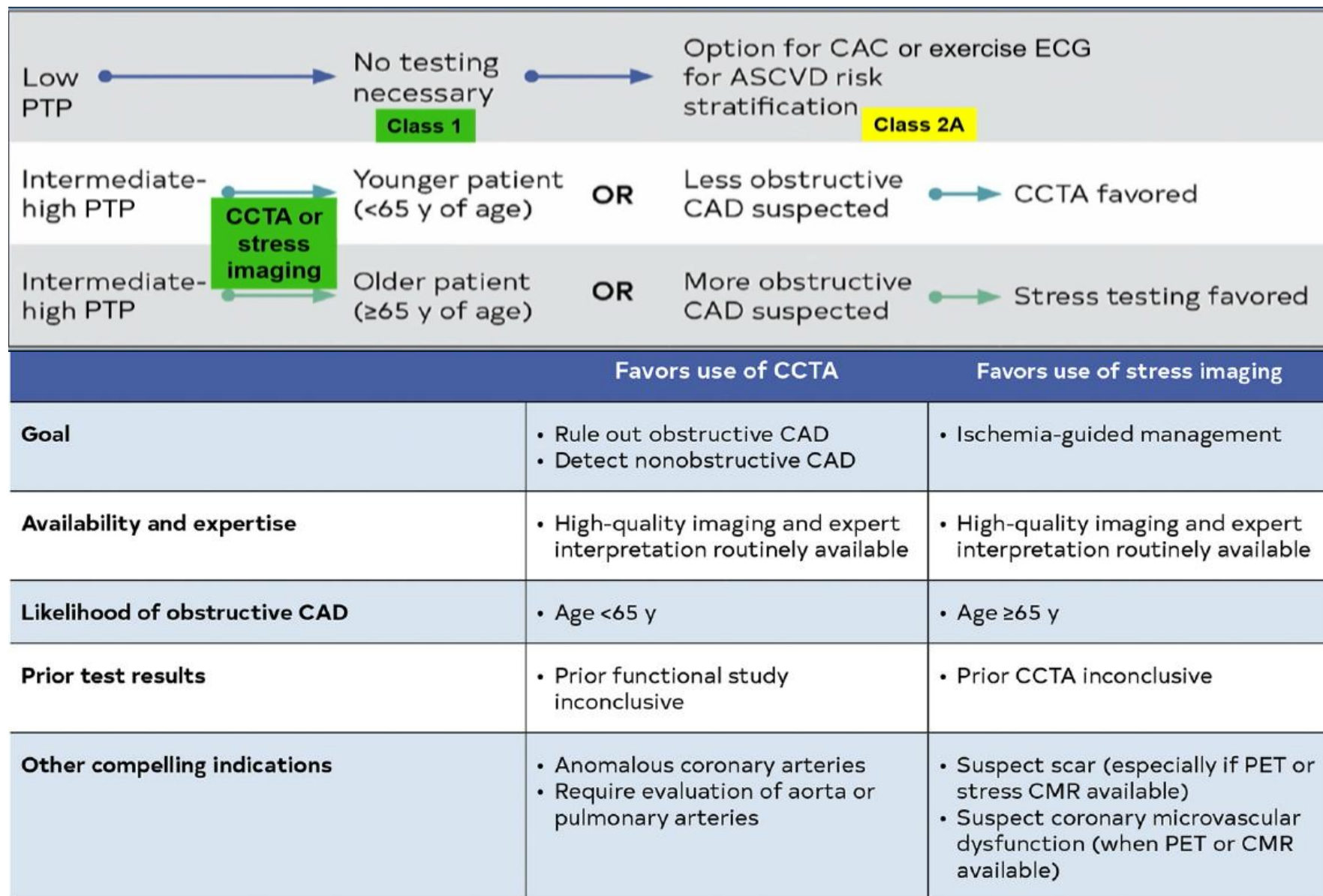


Clinical Judgment is Key!!

- The diagnostic utility of exercise stress testing is **maximal when the pre-test probability is intermediate (30-70%)**. In this range, test results significantly update the post-test probability, allowing clinicians to effectively establish or rule out CAD.
- **Low Pre-test Probability (<30%)**: A positive test result is likely a **false positive**; the post-test probability often remains low, meaning the test adds little diagnostic value and may lead to unnecessary follow-up.
- **High Pre-test Probability (>70%)**: A negative test result is likely a **false negative**; the post-test probability remains high, meaning the test cannot reliably rule out CAD, and further definitive testing is usually required.
- **Sequential Testing**: Applying Bayes' theorem to sequential tests (e.g., ECG followed by imaging) allows for updated probability calculations, though clinical utility is highest when tests are concordant and the initial pre-test prevalence is approximately **50%**



Loong, C. Y., & Anagnostopoulos, C. (2004). Diagnosis of coronary artery disease by radionuclide myocardial perfusion imaging. *Heart*, 90(suppl 5), v2-v9.



Pretest Probabilities of Obstructive CAD in Symptomatic Patients

(A) according to age, sex, and symptoms;

(B) according to age, sex, symptoms, and CAC

Age, y	Chest Pain		Dyspnea	
	Men	Women	Men	Women
30–39	≤4	≤5	0	3
40–49	≤22	≤10	12	3
50–59	≤32	≤13	20	9
60–69	≤44	≤16	27	14
70+	≤52	≤27	32	12

A Pretest probability based on age, sex, and symptoms

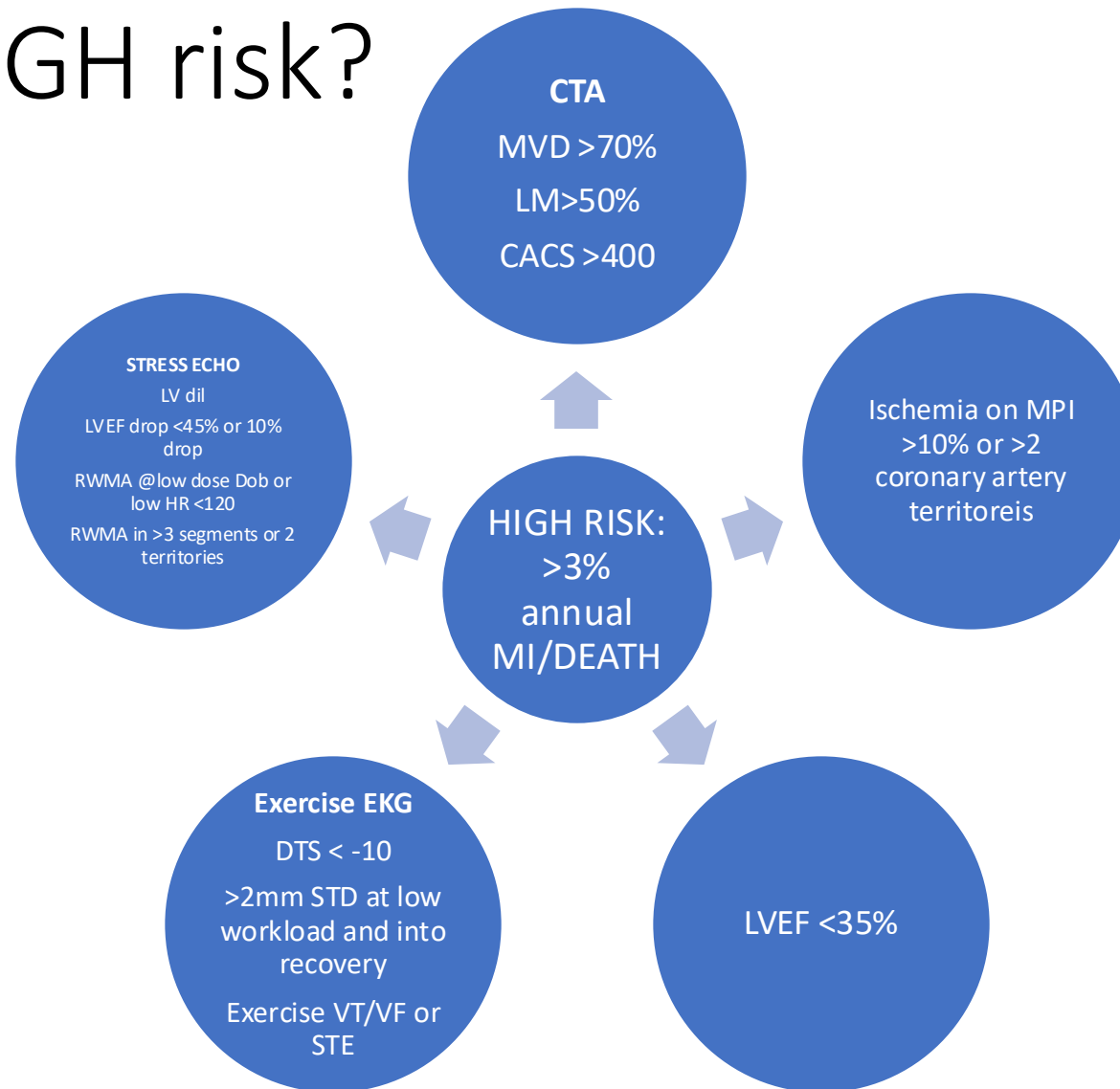
Low ≤15%	Intermediate–High >15%
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B Pretest probability based on age, sex, symptoms, and CAC score[†]

≤15%	>15%–50%	>50%
CAC 1–99	CAC ≥100–999	CAC ≥1,000

Modified from Juarez-Orozco et al. (1) and Winther et al. (2). 1) The pretest probability shown is for patients with anginal symptoms. Patients with lower-risk symptoms would be expected to have lower pretest probability. 2) The darker green- and orange-shaded regions denote the groups in which noninvasive testing is most beneficial (pretest probability >15%). The light green-shaded regions denote the groups with pretest probability of CAD ≤15% in which the testing for diagnosis may be considered based on clinical judgment (1). 3) If CAC is available, it can also be used to estimate the pretest probability based on CAC score (2). CAC indicates coronary artery calcium; and CAD, coronary artery disease.

What is HIGH risk?



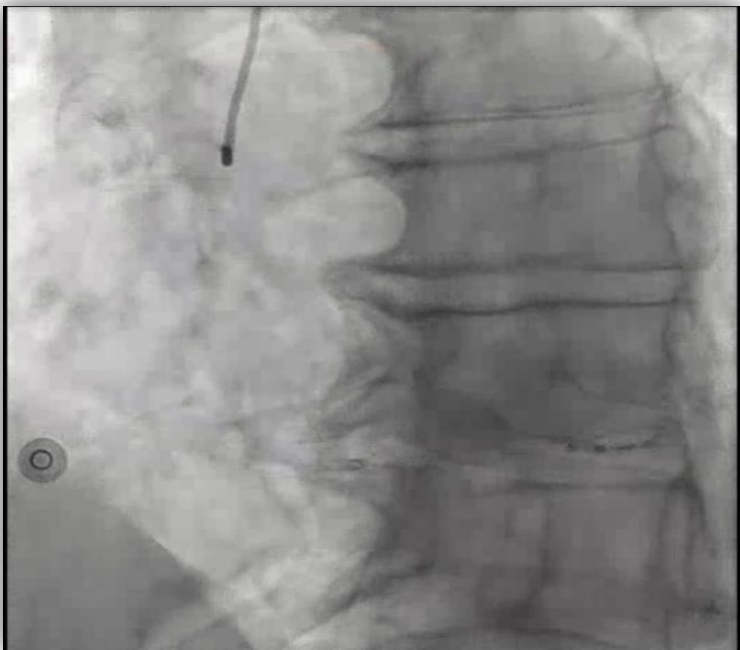
Case #1

- 59y M with PMH of HTN, HLD and prior smoking c/o **progressive chest heaviness on exertion** and associated fatigue x3-4 months.
- Noticed a **decrease in his functional status** in addition to vague chest tightness that typically occurs when patient is feeling stressed or high levels of exertion. He recalls difficulty with hiking while in Utah.
- 2022: CCTA with 50-69% stenosis of proximal LAD with vulnerable plaque. Non-obstructive CAD in RCA and LCX (i.e <50% stenosis). CACS 32
- 2022: Stress echo with excellent functional status without RWMA.
- On Coreg and amlodipine for HTN

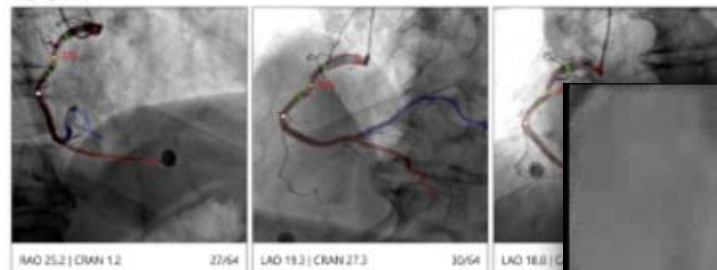
CCTA ordered



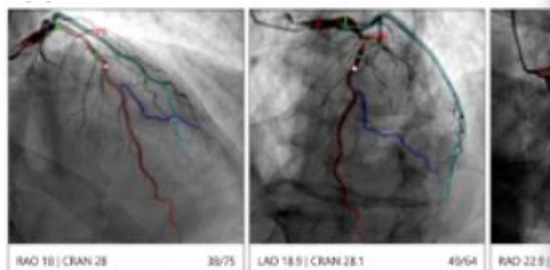
- 1. Predominantly non-calcific plaque causing severe (greater than 70%) stenosis, spotty calcification noted which is a high risk feature in the proximal RCA.
- 2. Heterogenous plaque causing **severe** (greater than 70%) stenosis in the **proximal LAD**.
- 3. Predominantly calcific plaque causing moderate (50-69 %) stenosis in the mid LAD
- Plaque Burden: Overall, there is severe amount of coronary plaque.



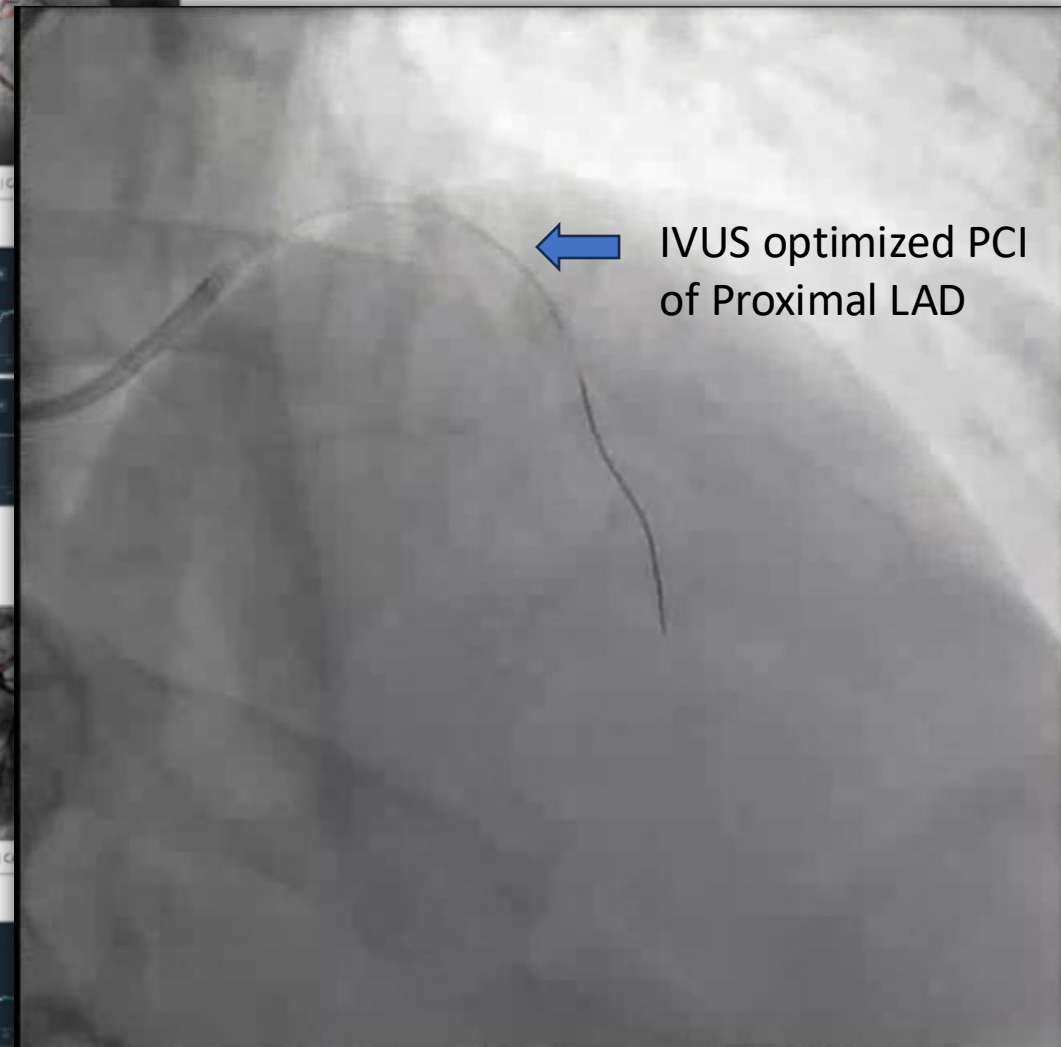
Angiograms



FFRangio Results



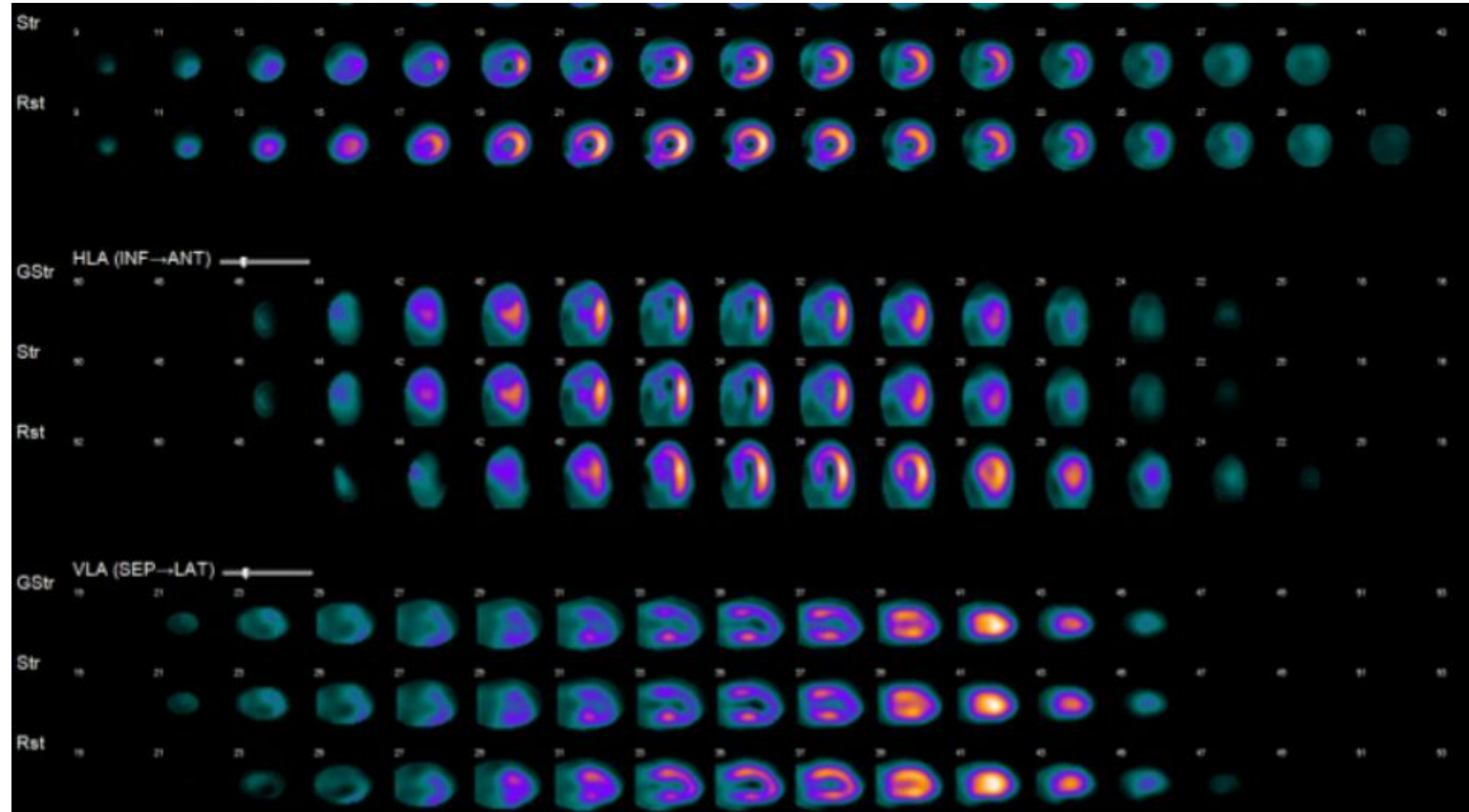
FFRangio Results

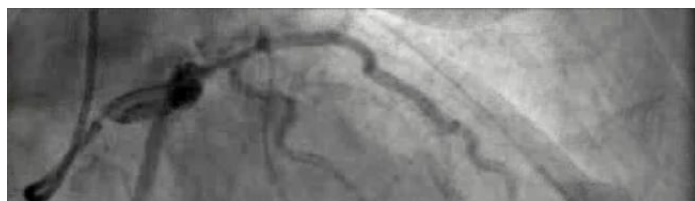
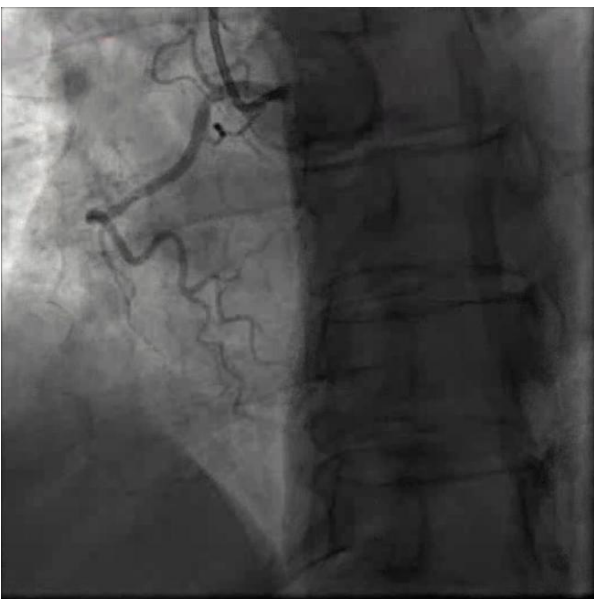


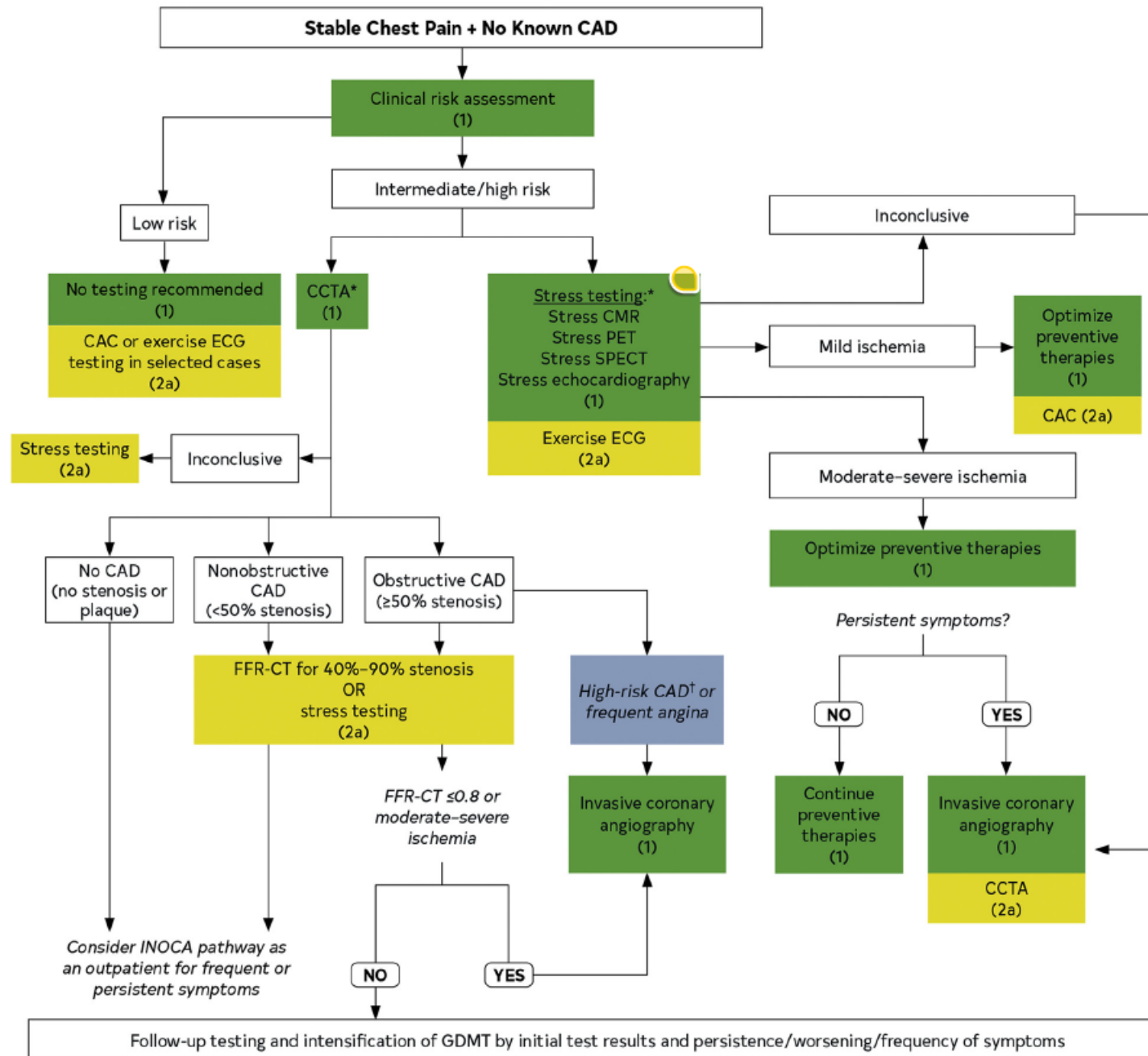
Case #2

- A 47y male with PMH of gastroesophageal reflux disease, and hyperlipidemia managed by Crestor, presents for evaluation of chest pain and exertional symptoms.
- Initially with walking half a block. After remission, symptoms recurred 4 months ago with increased intensity, now triggered by minimal exertion and accompanied by near-syncope and diaphoresis. Discomfort resolves within a minute of rest.

NST revealed large size area of decreased activity in the apical anterior, basal anteroseptal, mid anteroseptal, mid inferoseptal, apical septal, mid inferior, apical inferior, apical lateral and apex segment(s), which is severe in intensity and defect is partially reversible in rest images.







RISK STRATIFICATION FOR CARDIAC STRESS TESTING

LOW RISK

- <1% annual cardiac mortality
- Consider ETT

INTERMEDIATE RISK

- 1–3% annual cardiac mortality
- Consider imaging stress test

HIGH RISK

- >3% annual cardiac mortality
- Imaging stress test indicated

CONSIDER:

- ✓ Symptoms
- ✓ Functional Capacity
- ✓ Comorbidities
- ✓ CAD Risk Factors
- ✓ Pre-test Probability (e.g., Diamond–Forrester)

NOT
JUST
ABOUT
COMFORT—
IT'S ABOUT
OUTCOMES!



BABY
BEAR

LOW RISK

Good for ruling out,
but low event rate
→ low yield

MAMA
BEAR

INTERMEDIATE RISK

The “just right” zone
– best balance of
risk and benefit

PAPA
BEAR

HIGH RISK

Higher likelihood
of events—appropriate
for imaging

TOO LOW RISK...
TOO LOW YIELD.

TOO HIGH RISK...
TOO MUCH RISK!

I NEED JUST THE
RIGHT RISK!

WHY IS RISK
STRATIFICATION
SO HARD?!

THE GOAL: RIGHT TEST, RIGHT PATIENT, RIGHT RISK.
NOT TOO LITTLE. NOT TOO MUCH. JUST RIGHT.