

Disclosures

- None



Puerto Rico ACP Internal Medicine Update and Board Review Cardiovascular Diseases



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ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

- Hypertension
- Endocarditis
- Pericardial disease
- Vascular disease

ABIM “Gamesmanship”

- *Clinically oriented (patient based)*
- *Can only test on non-judgement issues (Class I and III)*
- *It takes 2-3 years for a question to be verified*

- Congenital heart disease
- Lipid disorders
- Valvular heart disease
- Antithrombotic Rx
- Heart Failure
- Miscellaneous

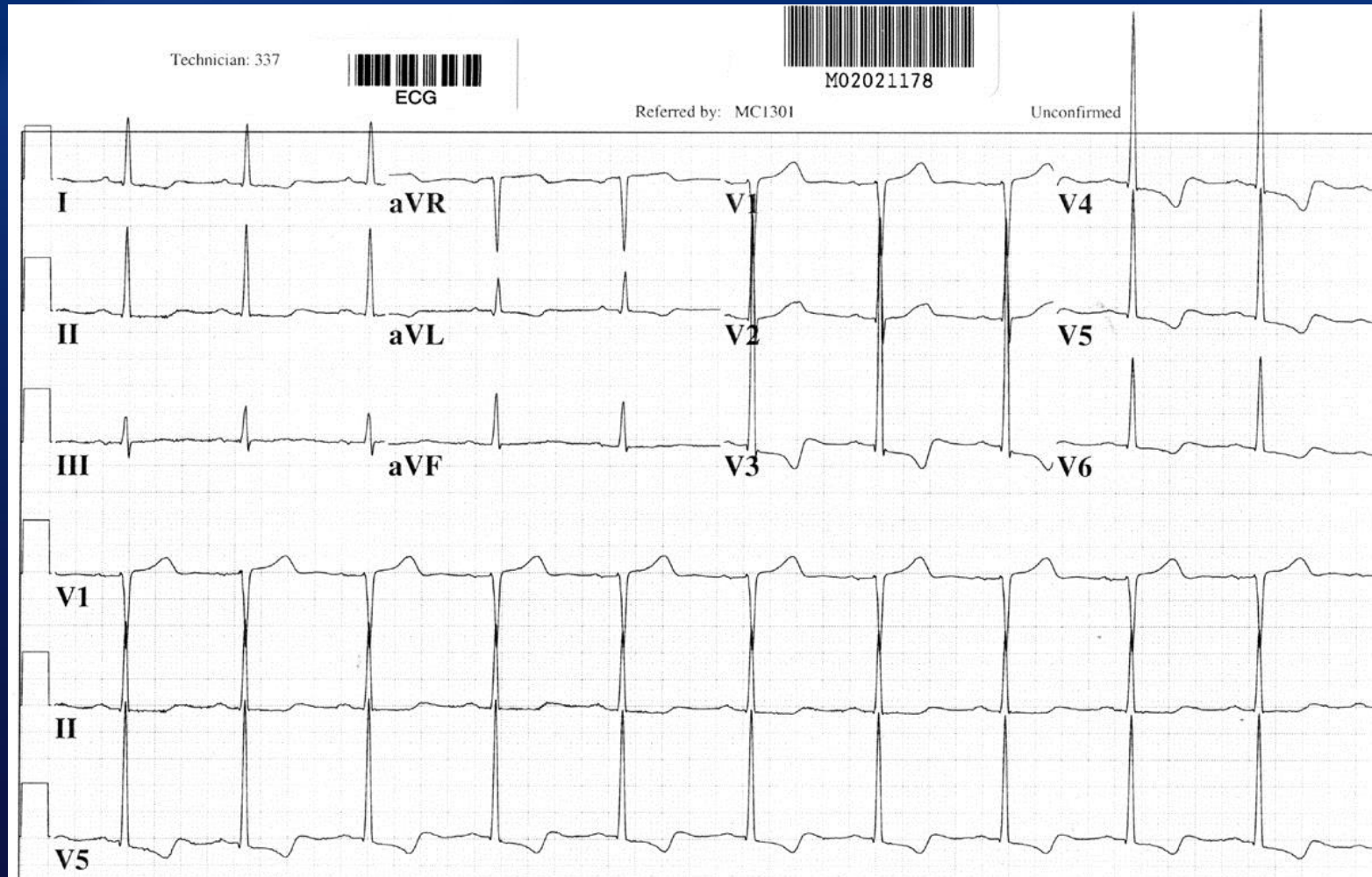
ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

- Hypertension
- Pericardial disease
- Ischemic Heart Disease
- Dysrhythmias
- Congenital heart disease
- Valvular heart disease
- Heart Failure
- Endocarditis
- Vascular disease
- Syncope
- Preoperative consultation
- Lipid disorders
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- Miscellaneous

58 yo for an annual physical examination

- No complaints
- BMI 28.5
- Physical examination:
 - 6', 210 lbs (BMI:
 - BP 140/85, HR 60
 - Lungs: Clear
 - CV: Tympanic A₂, S₄

ECG



Evolution of BP Goals in guidelines documents

Guideline		2017 ACC/AHA Hypertension guidelines		
JNC 7			SBP	DBP
JNC 8	Normal	< 120	and	< 80
	Elevated	120-129	and	< 80
AHA/ACC/ASH	Stage 1	130-139	or	80-89
	Stage 2	> 140	or	≥ 90
ACP/AAFP	2017	< 150 (> 60 yo) < 140 (> 60 and TIA, CV risk)		
ADA	2017	< 140/90		
ACC/AHA	2017	< 130/80 for general population		

Management of hypertension

Screening for secondary HTN

New-onset or uncontrolled HTN (adult)



- Drug resistant/induced HTN
- Abrupt onset HTN
- HTN < 30 yo
- Exacerbation of previously controlled HTN
- Disproportionate TOD
- Accelerated/malignant HTN
- Onset of diastolic HTN in older patient (> 65 yo)
- Unprovoked or excessive hypokalemia

Management of hypertension

Screening for secondary HTN (“common”)

	Prevalence	Screening Test
Renal parenchymal	1-2%	Renal Ultrasound
Renovascular	5-34%	Renal Doppler CT/MRA
Primary aldosteronism	8-20%	Plasma Aldo/Renin
Obstructive Sleep Apnea	25-50%	Berlin, Epworth, overnight oximetry
Drug/EtOH	2-4%	Urinary drug screen

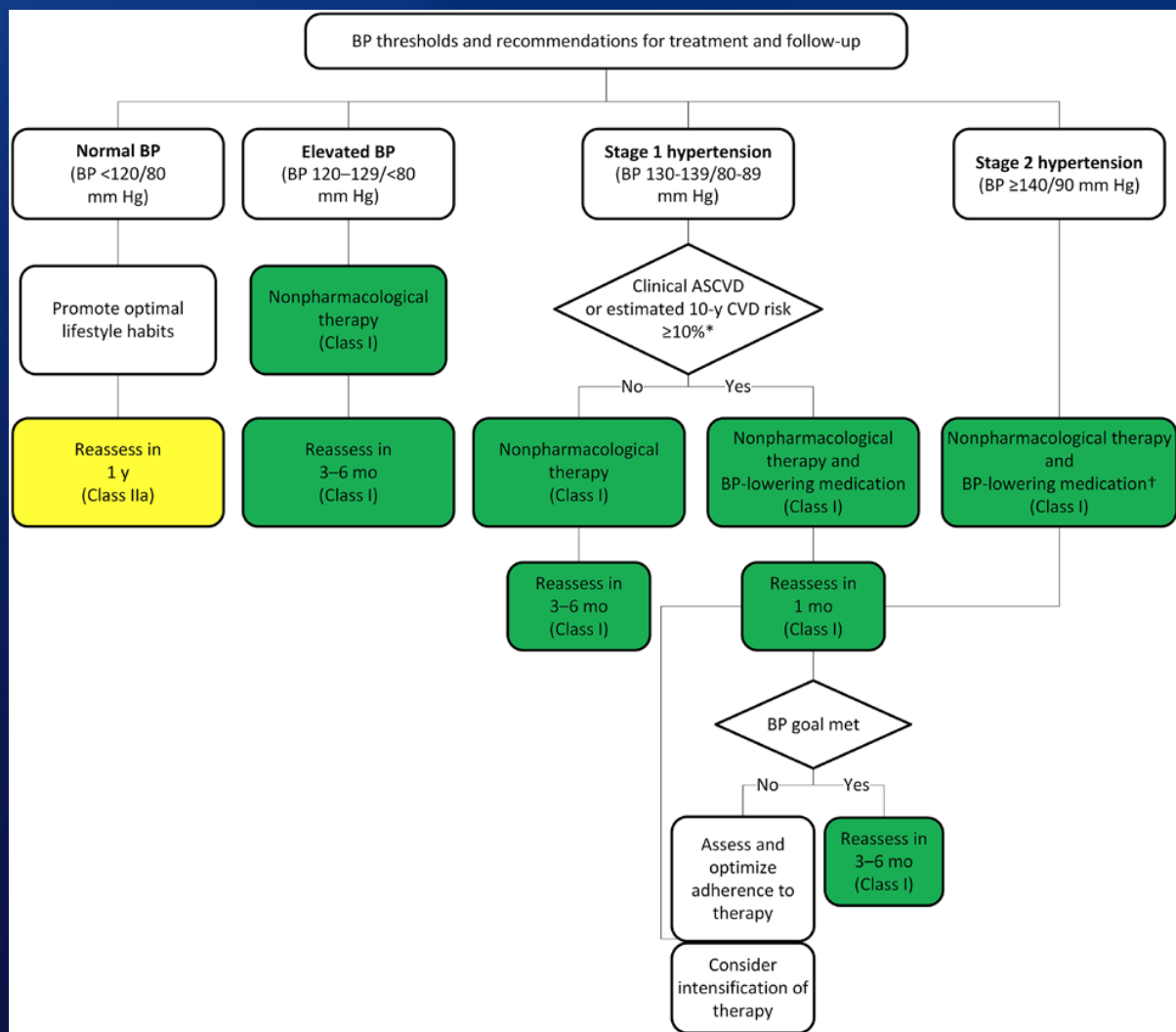
Management of hypertension

Screening for secondary HTN (rare)

Condition	Screening Test
Pheochromocytoma	24° urinary meta
Cushing's syndrome	Overnight 1 mg dexamethasone suppression
Thyroid	TSH, TFT
Aortic coarctation	Echocardiography
Primary Hyperpara	Calcium
Congenital adrenal hyperplasia	Hypokalemia
Mineralocorticoid excess	Low aldosterone and renin
Acromegaly	Serum growth hormone

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Hypertension Guideline

Blood pressure treatment and follow-up



2017 ACP AAFP Clinical guideline for adults > 60 yo

Recommendations

Strong (high)	Initiate treatment with SBP persistently ≥ 150 mm Hg to achieve a target SBP < 150 mm Hg to reduce the risk for stroke, cardiac events, and possibly mortality. Periodic discussion of the benefits and harms of specific blood pressure targets.
Weak (Mod)	Hx of stroke or TIA or CVA, initiate or intensify Rx to achieve a target systolic blood pressure < 140 mm Hg to reduce the risk for recurrent stroke.
Weak (low)	With high CV risk, initiate or intensify Rx to achieve a target systolic blood pressure < 140 mm Hg.

2017 ACP AAFP Clinical guideline for adults > 60 yo

Clinical Considerations

Accurate measurement of BP is important before initiating treatment for hypertension. Some patients may have elevated BP in clinical settings, and ambulatory measurement may be appropriate.

Clinicians should consider treatment with nonpharmacologic options, including weight loss, dietary changes, and an increase in physical activity, initially or concurrently with pharmacologic treatment.

Many older adults may be taking various medications. Clinicians should consider treatment burden and drug interactions when deciding on treatment options.

When selecting pharmacologic therapy, clinicians should prescribe generic drugs where available.

Evidence for adults who are frail or those with multimorbidity is limited.

Primary

- Thiazide diuretic
- ACEI
- ARB
- CCB

Hypertension, evidence of target organ effects

- Weight loss, diet, alcohol
- Exercise
- Drug therapy
- Other risk factors?

M02021178

Referred by: MC1301

Unconfirmed

Secondary

- | | |
|------------------------------|--|
| • Loop diuretic | • Direct renin inhibitor (aliskiren) |
| • Potassium sparing diuretic | • α_1 blocker (doxazosin) |
| • Aldosterone antagonist | • Central α_2 agonist (clonidine) |

COR	LOE	Recommendation
I	C-EO	Initiate two drugs if stage 2 HTN present and an average BP > 20/10
IIa	C-EO	Initiate one drug if stage 1 HTN

V5

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

- Hypertension

- Conflicting goals from professional societies
- Target organ damage?
- Additional risk factors
- Lifestyle changes
- Drug therapy (often with 2 initial Rx)

- Congenital heart disease

- Valvular heart disease

- Heart Failure

- E

- V

- S

- D

- C

- L

- A

- M

- E



- Miscellaneous

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

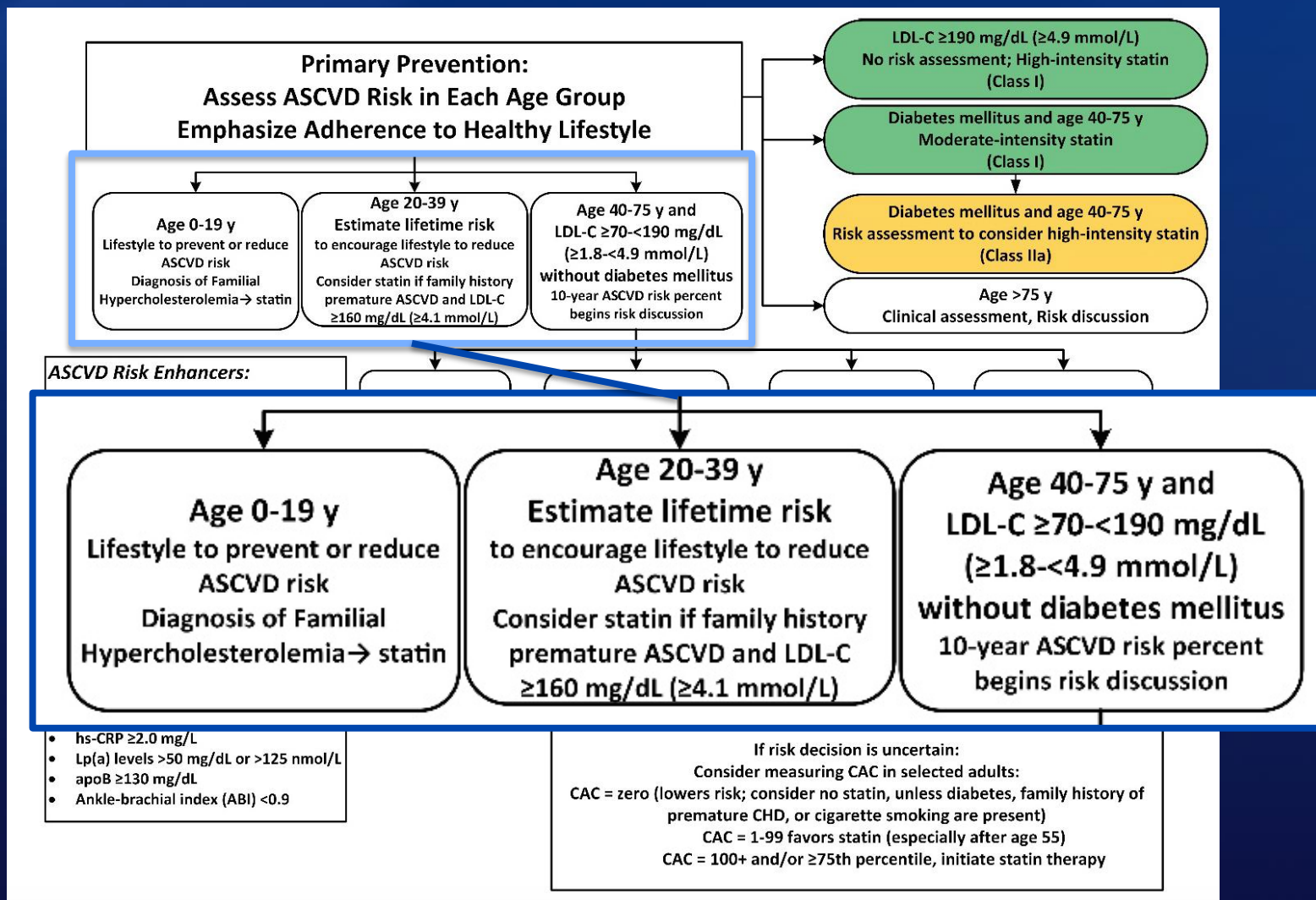
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AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol

LDL-C ≥ 190 mg/dL (≥ 4.9 mmol/L) No risk assessment: High-intensity statin			
	High	Moderate	Low
Goal	$\geq 50\%$	30-49%	$< 30\%$
Drug & Dosage	Atorvastatin 80 mg Rosuvastatin 20 mg	Atorvastatin 10 mg Rosuvastatin 10 mg Simvastatin 20-40 Mg Pravastatin 20-40 mg	Simvastatin 10 mg Pravastatin 10-20 mg
• Ankle-brachial index (ABI) < 0.9		CAC = zero (lowers risk; consider no statin, unless diabetes, family history or premature CHD, or cigarette smoking are present) CAC = 1-99 favors statin (especially after age 55) CAC = 100+ and/or ≥ 75th percentile, initiate statin therapy	

Grundy et al Circ 2018

AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol



Grundy et al Circ 2018

AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol

ASCVD Risk Enhancers:

- Family history of premature ASCVD
- Persistently elevated LDL-C ≥ 160 mg/dL (≥ 4.1 mmol/L)
- Chronic kidney disease
- Metabolic syndrome
- Conditions specific to women (e.g., preeclampsia, premature menopause)
- Inflammatory diseases (especially rheumatoid arthritis, psoriasis, HIV)
- Ethnicity (e.g., South Asian ancestry)

Lipid/Biomarkers:

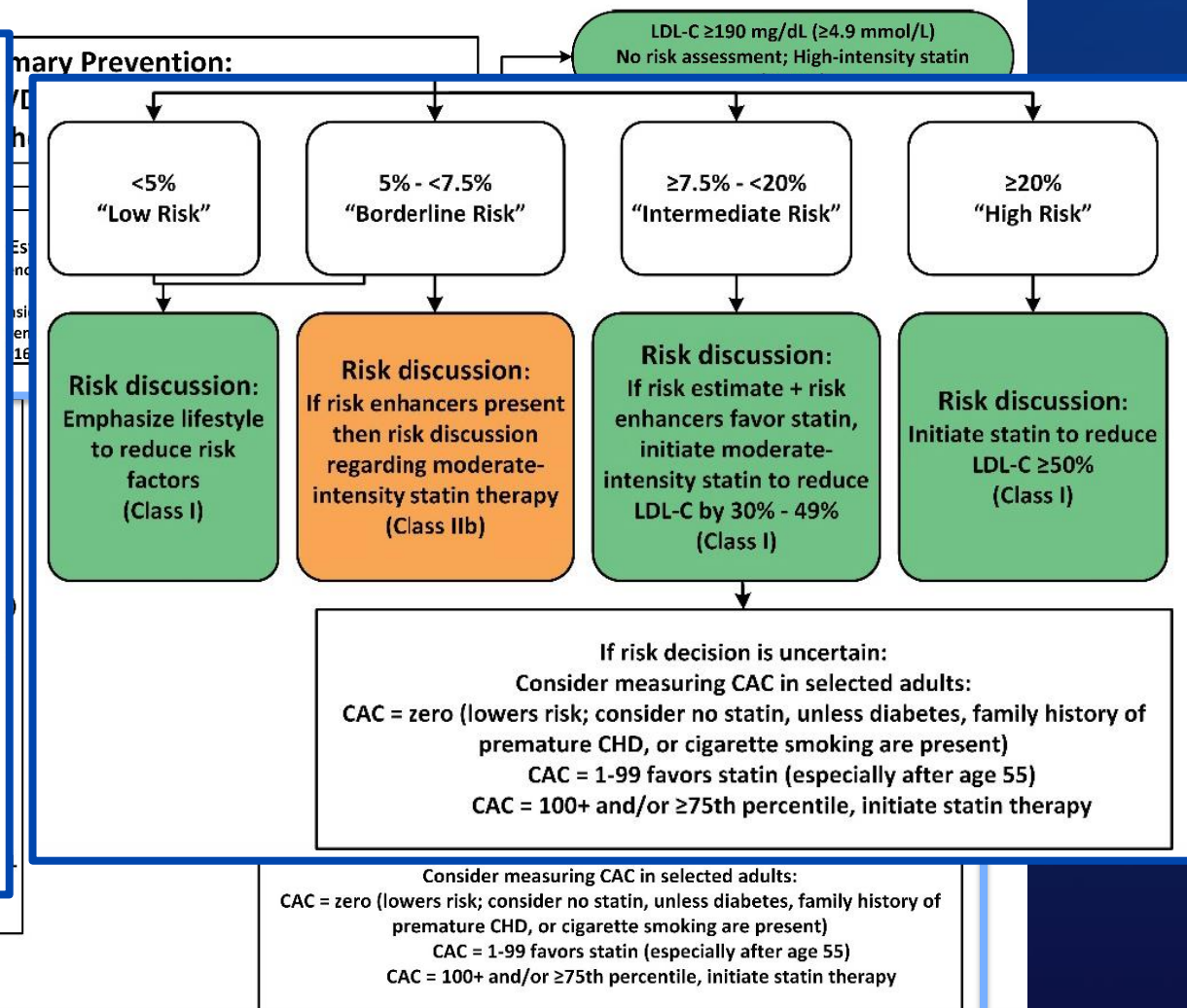
- Persistently elevated triglycerides (≥ 175 mg/dL, (≥ 2.0 mmol/L))

In selected individuals if measured:

- hs-CRP ≥ 2.0 mg/L
- Lp(a) levels > 50 mg/dL or > 125 nmol/L
- apoB ≥ 130 mg/dL
- Ankle-brachial index (ABI) < 0.9

- Ankle-brachial index (ABI) < 0.9

Primary Prevention:



Grundy et al Circ 2018

AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol

Diabetes:

- 40-75 yo

20-39, LDL $\geq$ 160

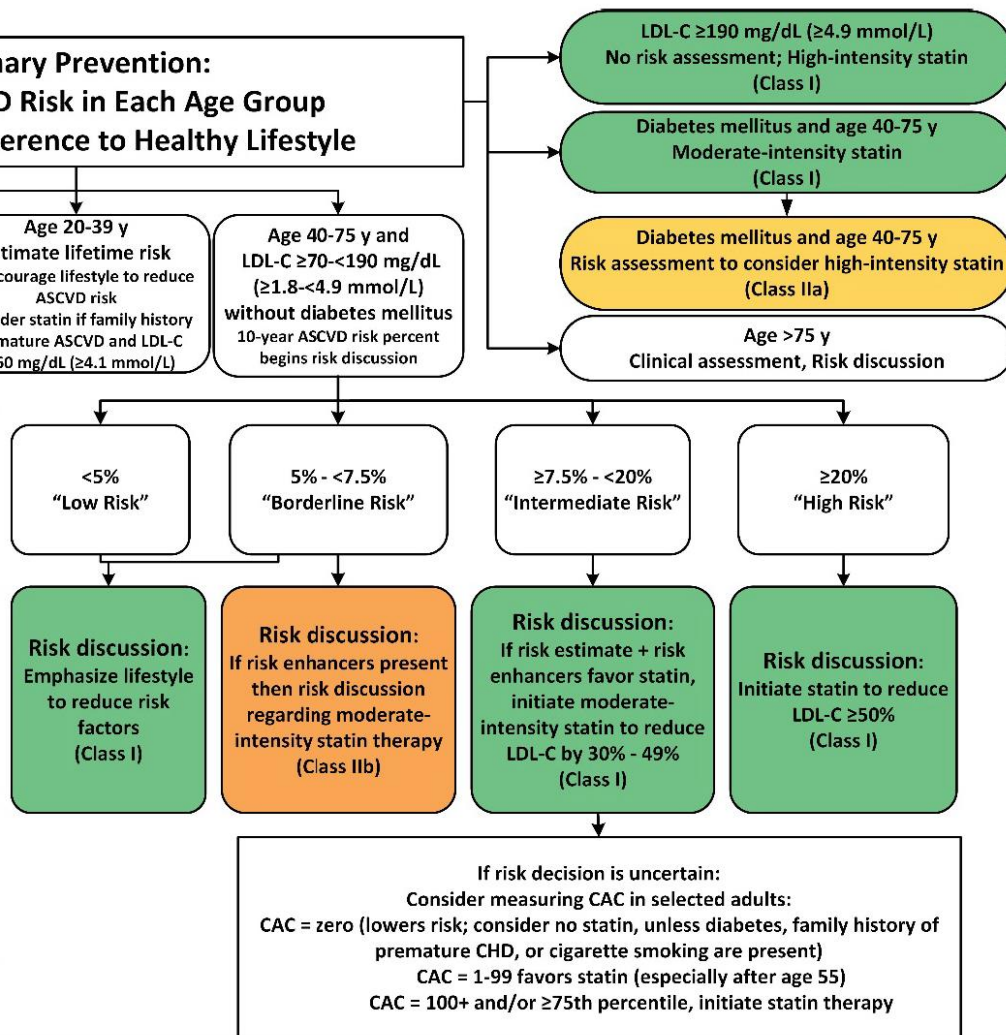
- Lifetime risk

40-75, LDL $\geq$ 70:

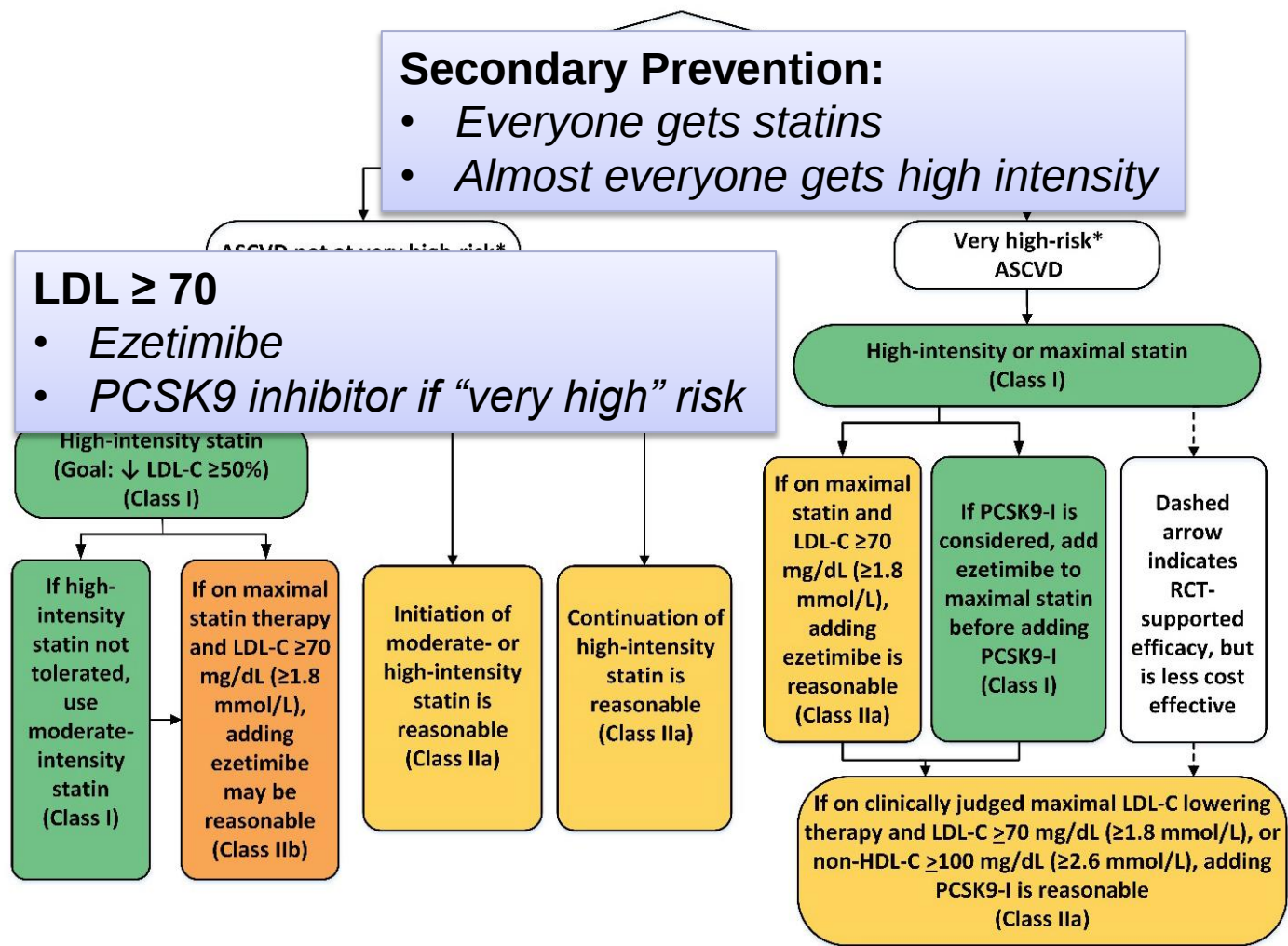
- 10 year risk $>$ 5%

- Consider statin if any of the following are present:**
- Persistently elevated LDL-C $\geq$ 190 mg/dL ($\geq$ 4.9 mmol/L)
 - Chronic kidney disease
 - Metabolic syndrome
 - Conditions specific to women (e.g., preeclampsia, premature menopause)
 - Inflammatory diseases (especially rheumatoid arthritis, psoriasis, HIV)
 - Ethnicity (e.g., South Asian ancestry)
- Lipid/Biomarkers:**
- Persistently elevated triglycerides ($\geq$ 175 mg/dL, $\geq$ 2.0 mmol/L)
- In selected individuals if measured:**
- hs-CRP $\geq$ 2.0 mg/L
 - Lp(a) levels $>$ 50 mg/dL or $>$ 125 nmol/L
 - apoB $\geq$ 130 mg/dL
 - Ankle-brachial index (ABI) $<$ 0.9

Primary Prevention: Assess ASCVD Risk in Each Age Group Emphasize Adherence to Healthy Lifestyle



AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol



ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

Primary Prevention:

Statin:

- LDL > 190
- DM: 40-75
- All others:
 - 20-39: Family Hx premature CAD and LDL $\geq$ 160
 - 40-75: LDL 70-190 and 10 year risk > 7.5

Secondary Prevention:

- *Everyone gets statins*
- *Almost everyone gets high intensity*
- *If LDL still elevated then ezetimibe followed by PCSK9 inhibitor*

- Valvular heart disease
- Heart Failure

- Antithrombotic Rx
- Miscellaneous

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

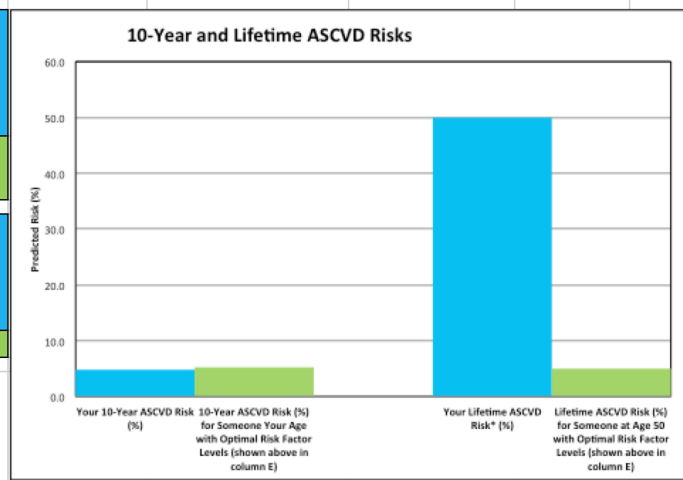
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2013 ACC/AHA CV risk Guideline

Estimating CV risk

2	Risk Factor	Units	Value	Acceptable range of values	Optimal values
3	Sex	M (for males) or F (for females)	M	M or F	
4	Age	years	59	20-79	
5	Race	AA (for African Americans) or WH (for whites or others)	WH	AA or WH	
6	Total Cholesterol	mg/dL	180	130-320	170
7	HDL-Cholesterol	mg/dL	90	20-100	50
8	Systolic Blood Pressure	mm Hg	120	90-200	110
9	Treatment for High Blood Pressure	Y (for yes) or N (for no)	Y	Y or N	N
10	Diabetes	Y (for yes) or N (for no)	N	Y or N	N
11	Smoker	Y (for yes) or N (for no)	N	Y or N	N
12					
13	Your 10-Year ASCVD Risk (%)		4.8		
14	10-Year ASCVD Risk (%) for Someone Your Age with Optimal Risk Factor Levels (shown above in column E)		5.2		
15					
16	Your Lifetime ASCVD Risk* (%)		50.0		
17	Lifetime ASCVD Risk (%) for Someone at Age 50 with Optimal Risk Factor Levels (shown above in column E)		5.0		
18					

*This is the lifetime ASCVD risk for an individual at age 50 years with your risk factor levels. In rare cases, 10-year risks may exceed lifetime risks given that the estimates come from different approaches. While 10-



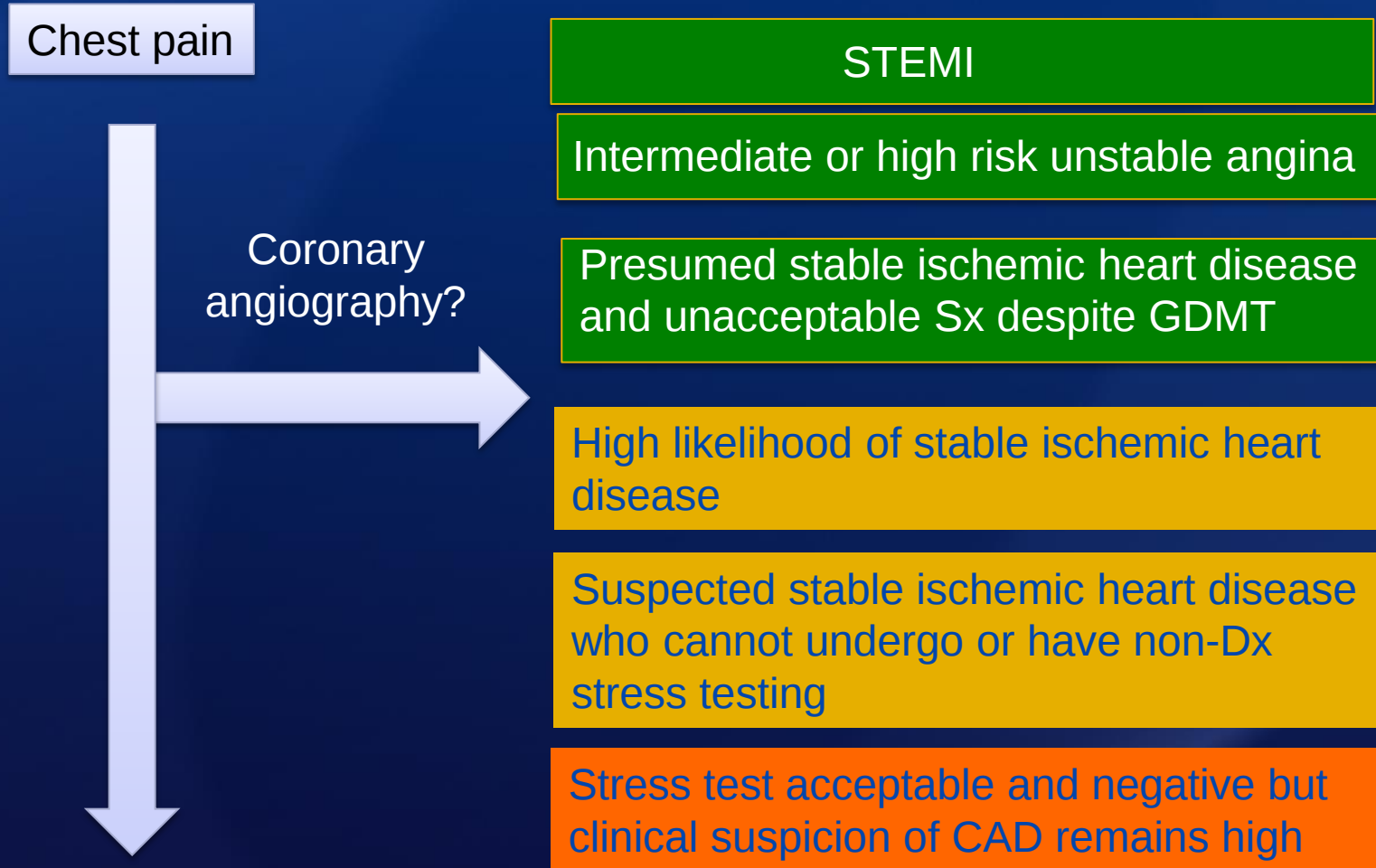
2013 F

CV RISK CALCULATOR

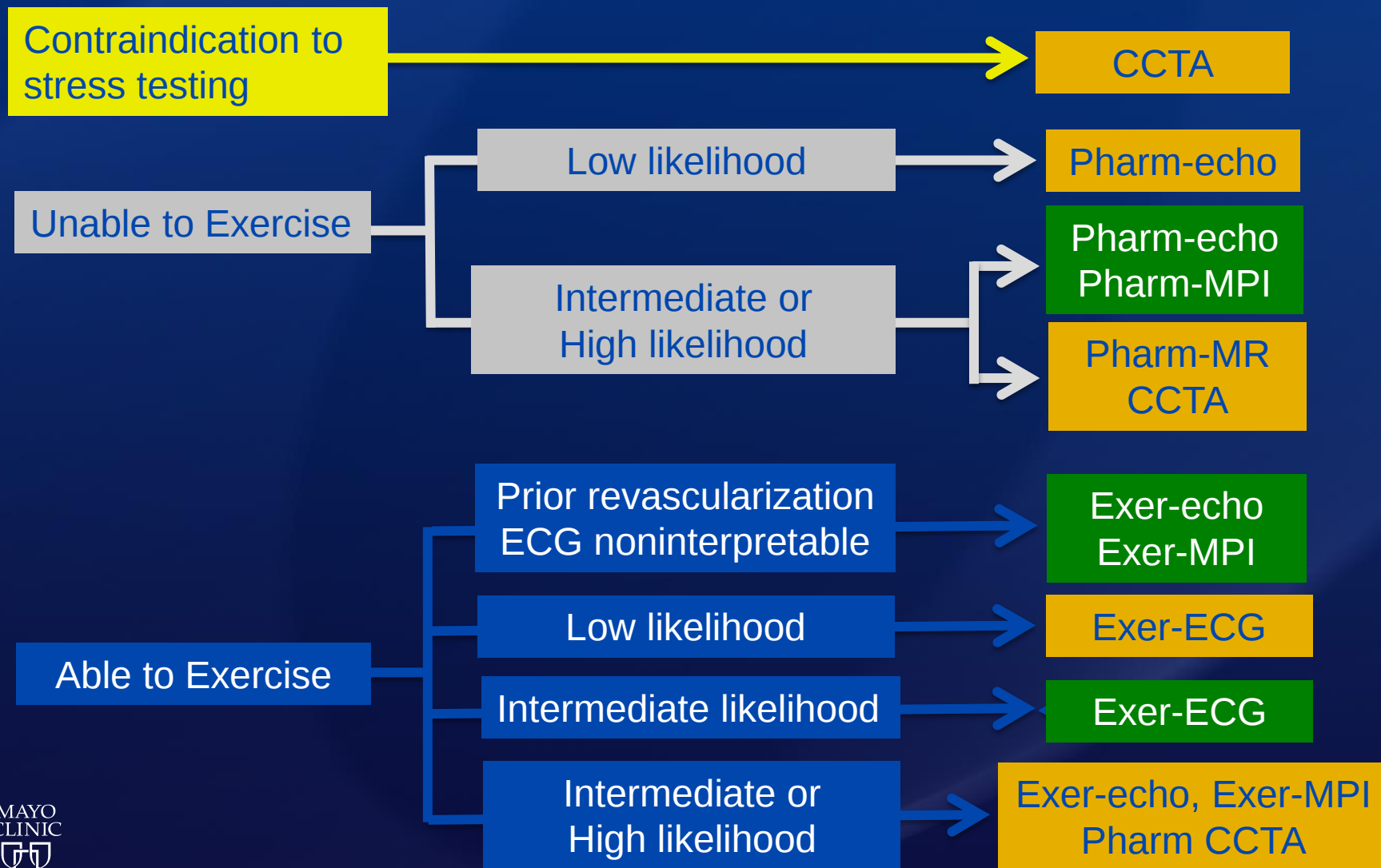
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www.cvriskcalculator.com

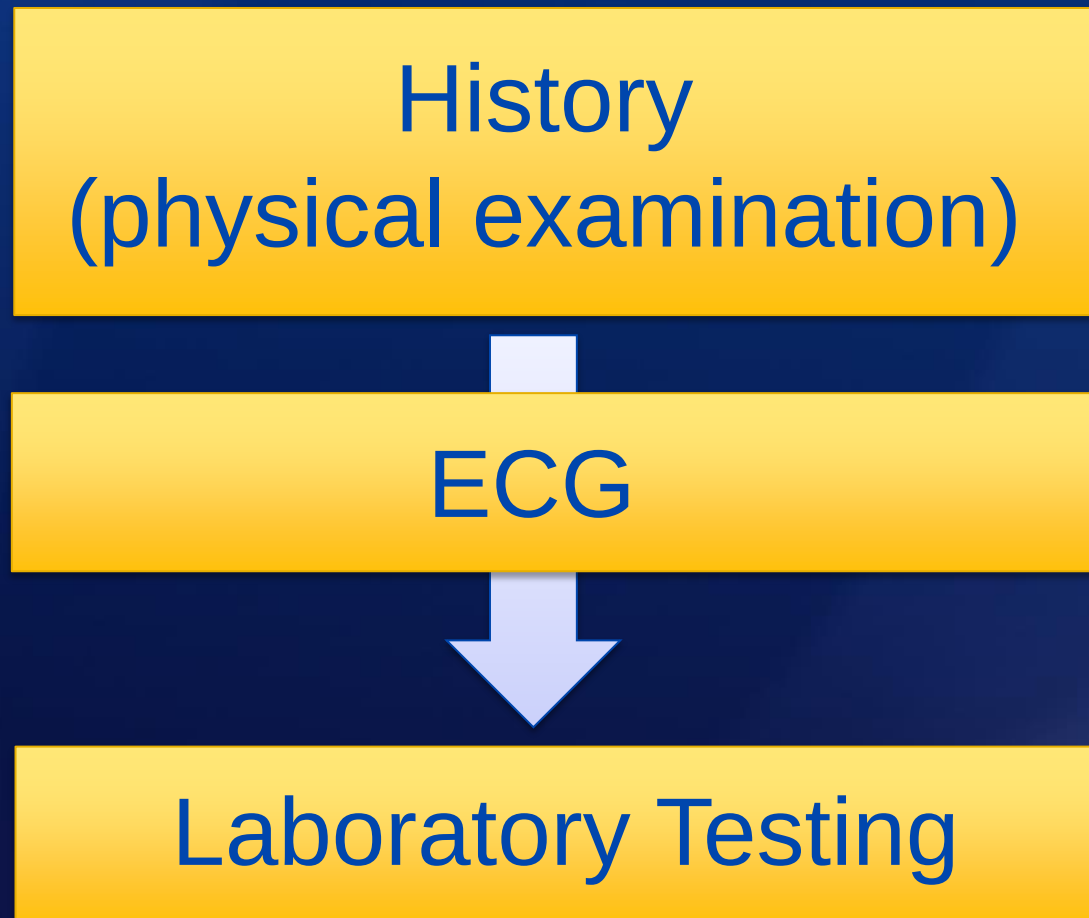
2012/2014 ACC/AHA/AATS PCNA/SCAI/STS Stable IHD Guideline *Chest pain*



2012/2014 ACC/AHA/AATS PCNA/SCAI/STS Stable IHD Guideline *Chest pain-noninvasive testing*



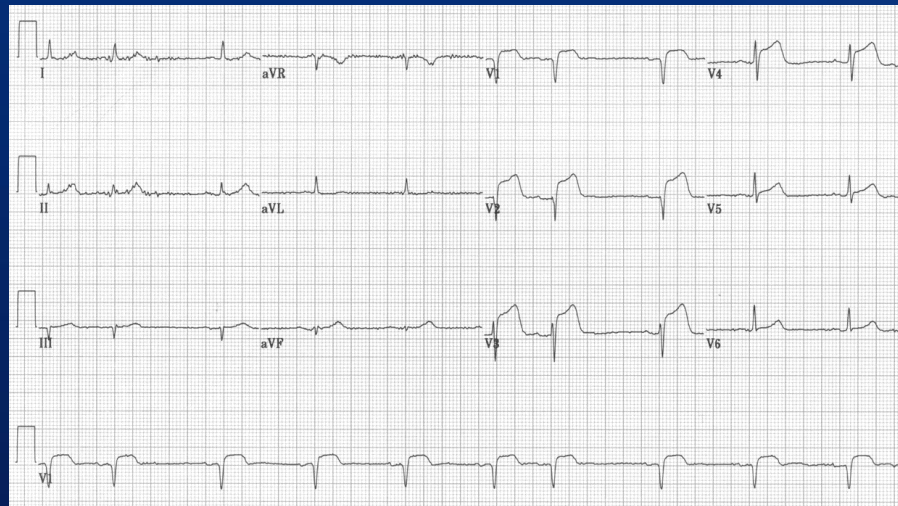
Evaluation of Possible Cardiac Chest Pain in the acute setting



ECG in acute CP: *STEMI vs. NSTEMI*

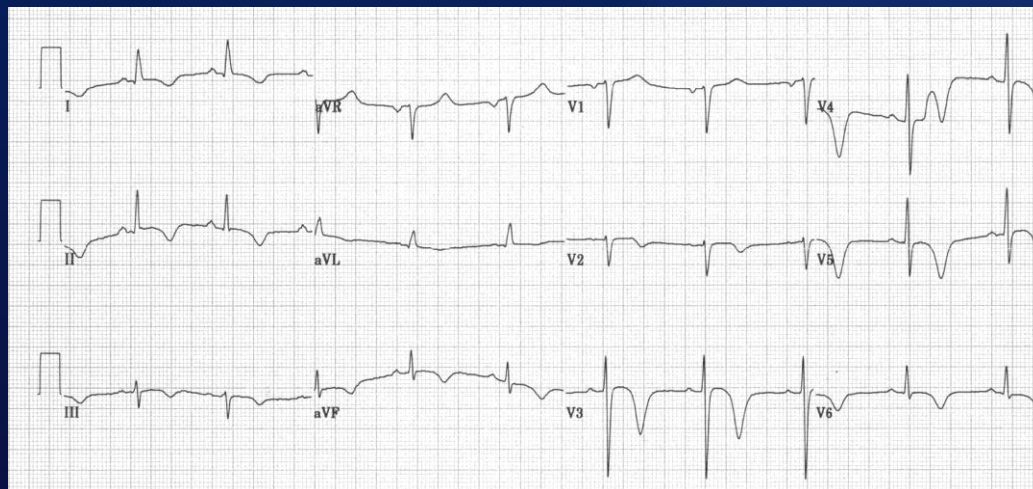
STEMI

Emergent coronary
angiography

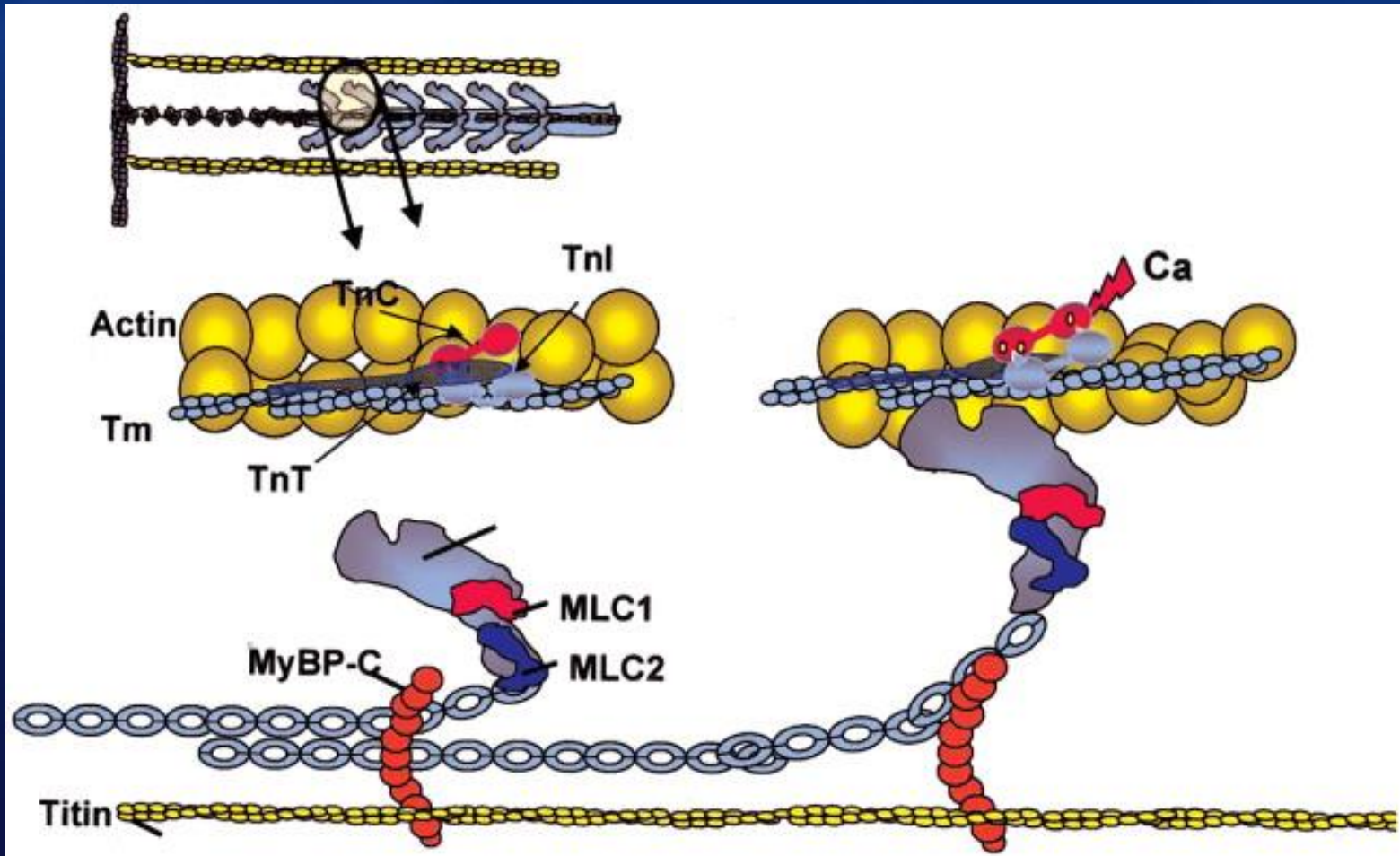


NSTEMI

Emergent coronary
angiography?



Biochemical Approach to Identifying Myocardial Injury



Non ACS Causes for Troponin Elevation “Cardiac”

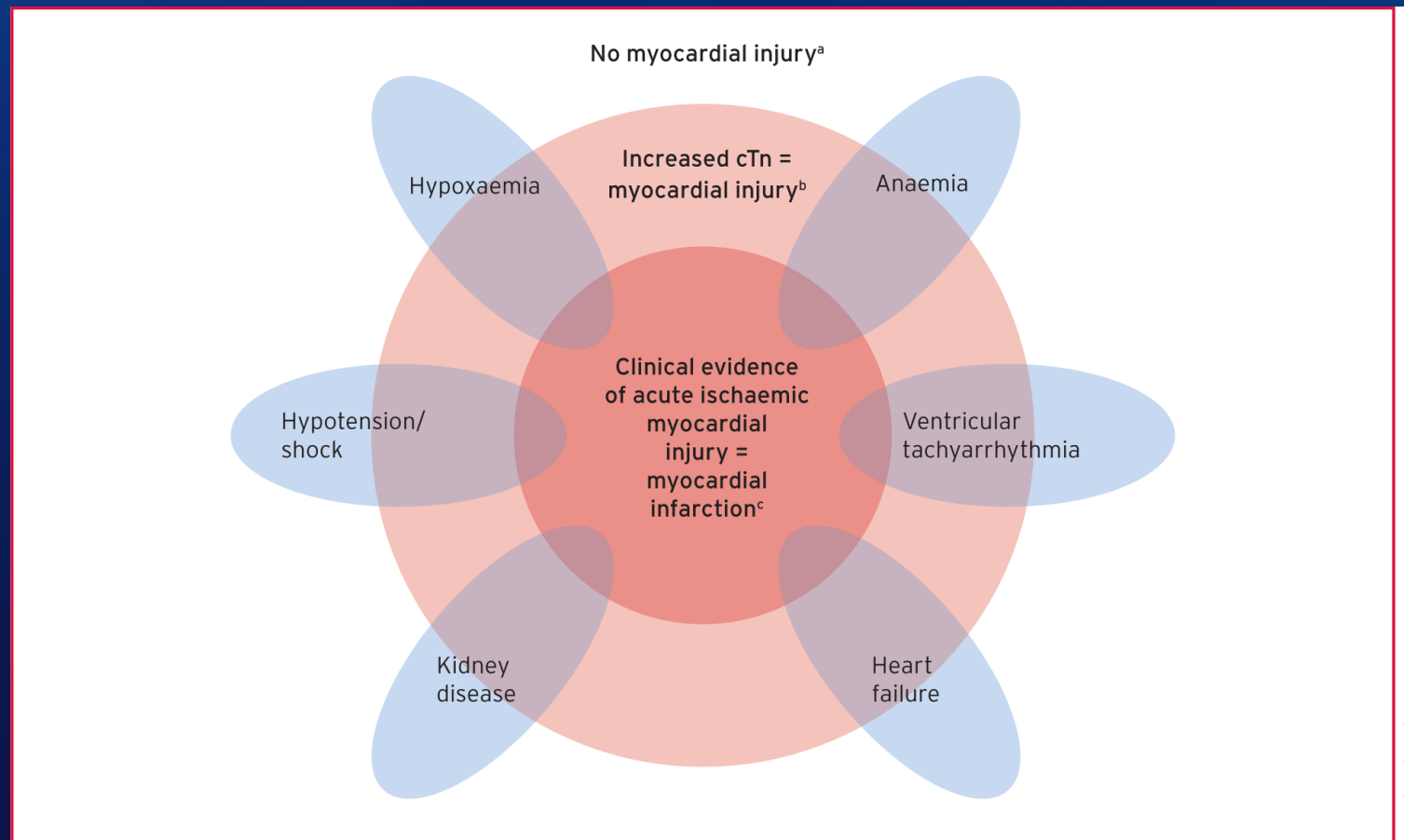
Heart Failure	Arrhythmias
ICD shocks	Aortic Valve Disease
Cardiac Surgery	Hypertrophy
Ablation	Myocarditis
Cardiac Contusion	Myopericarditis
Infiltrative Disease	Spasm

Non ACS Causes for Troponin Elevation “NonCardiac”

Vascular	Aortic dissection Vasculitis Hypertension
Pulmonary	PE Pulmonary hypertension Respiratory failure
Skeletal	Skeletal myopathy Extreme exertion Rhabdomyolysis
Other	Renal failure Sepsis Chemotherapy

Fourth Universal Definition of MI

ESC/ACC/AHA/WHF Expert Consensus Document



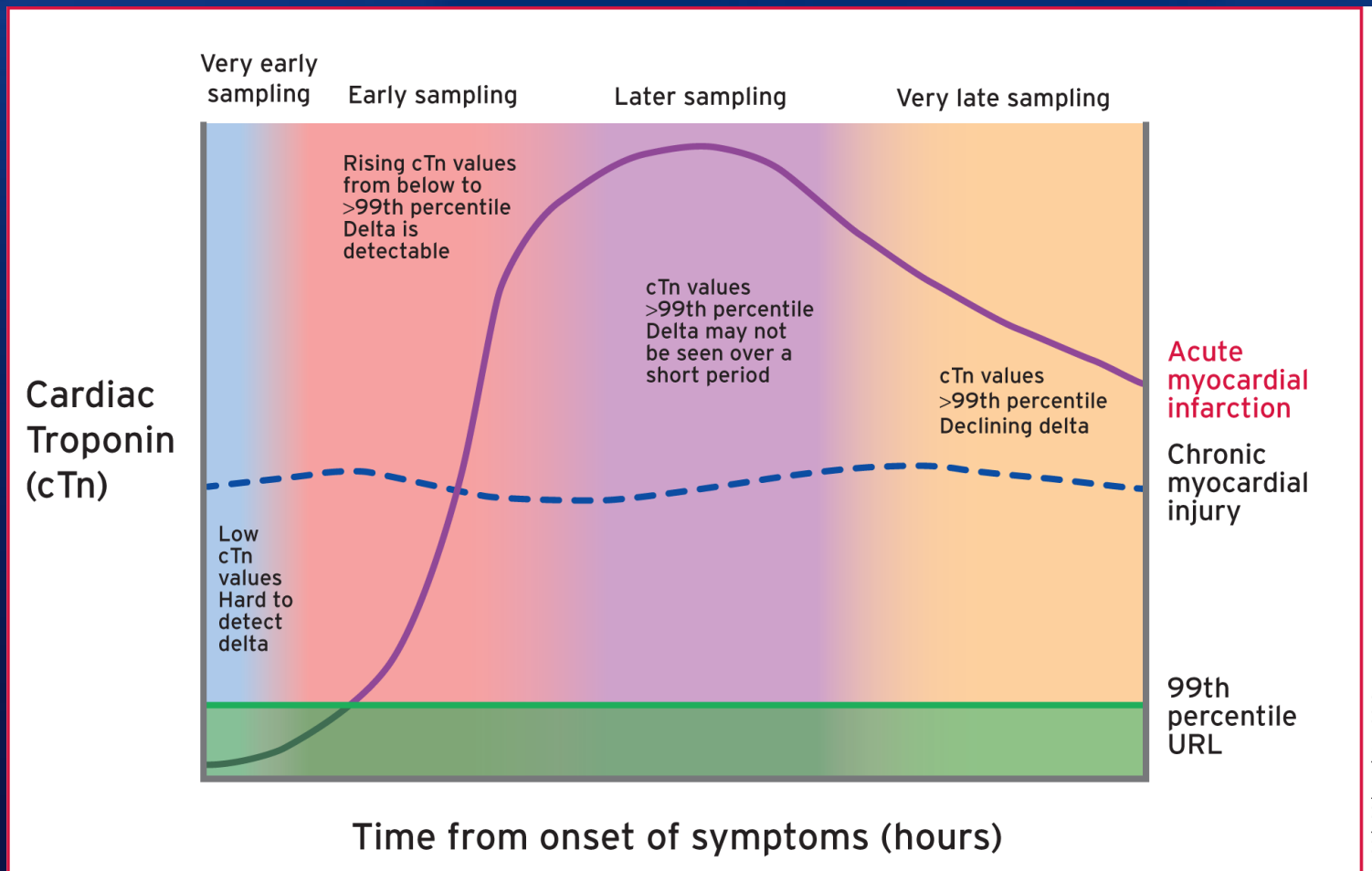
Fourth Universal Definition of MI

ESC/ACC/AHA/WHF Expert Consensus Document

Term	Criteria
Myocardial Injury	Elevated cardiac troponin > 99 th URL
Myocardial Injury (acute)	Rise and/or fall
Myocardial Infarction	Elevated cardiac troponin > 99th URL with a rise and fall, and ≥ 1 of the following: • Symptoms of ischemia • Ischemic ECG changes • Development of Q waves • Imaging of presumed new loss of myocardium • Angiographic evidence

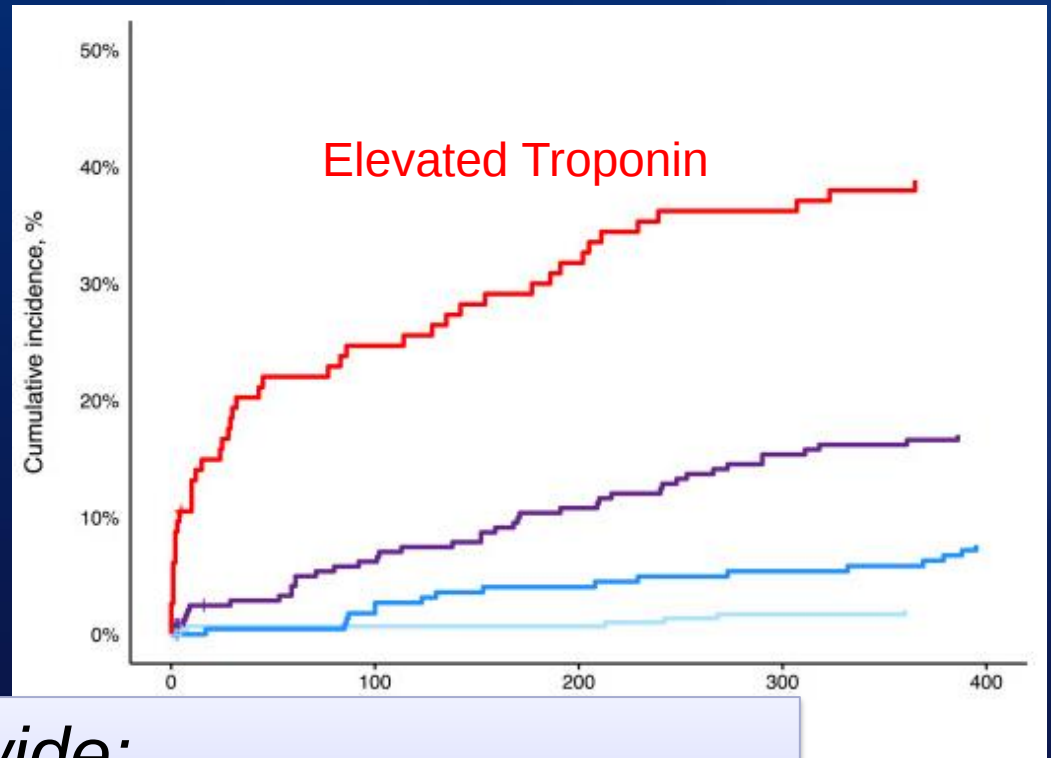
Fourth Universal Definition of MI

ESC/ACC/AHA/WHF Expert Consensus Document



High Sensitivity Cardiac Troponins in patients without suspected ACS

- 918 consecutive patients evaluated in an ER without suspected ACS had troponins measured
- Elevated troponin in 12.4%

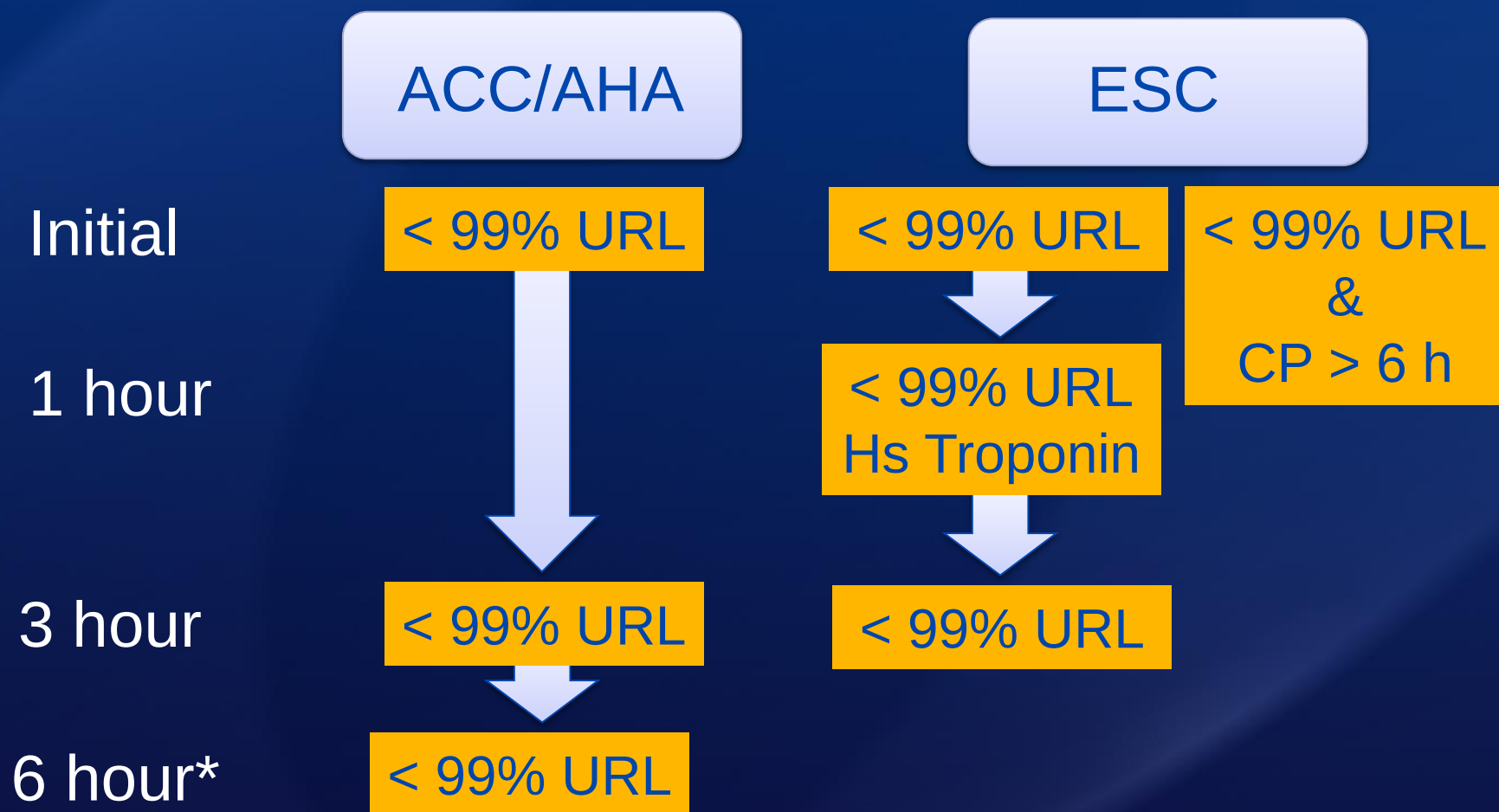


ass Although CI wide:

inc Higher troponin α Higher Mortality
mortality

Strategies for ACS w/o ST elevation

Professional Society Recommendations



*additional intermediate/high risk clinical features

Amsterdam Circ 2014
Roffi et al EHJ 2016

Strategies for ACS w/o ST elevation

Use of hs Troponin assays for rapid decision?

	Single Sample	1 hr	0-1 hr
Initial	< 5 ng/L	< 5 ng/L	< 5 ng/L & CP > 3 h
1 hour		< 2 ng/L	< 2 ng/L

ABIM Internal Medicine Certification Examination

Estimate 10 year and lifetime risk (www.cvriskcalculator.com)

“Stable” chest pain

- *Stress testing*

Urgent/emergent chest pain

- *STEMI vs. NSTEMI*
- *Troponins*
- *Cardiac catheterization*

- Hypertension

- Pericardial disease

- Ischemic Heart Disease

- Dysrhythmias

- Congenital heart disease

- Valvular heart disease

- Heart Failure

- Syncope

- Preoperative consultation

- Lipid disorders

- Antithrombotic Rx

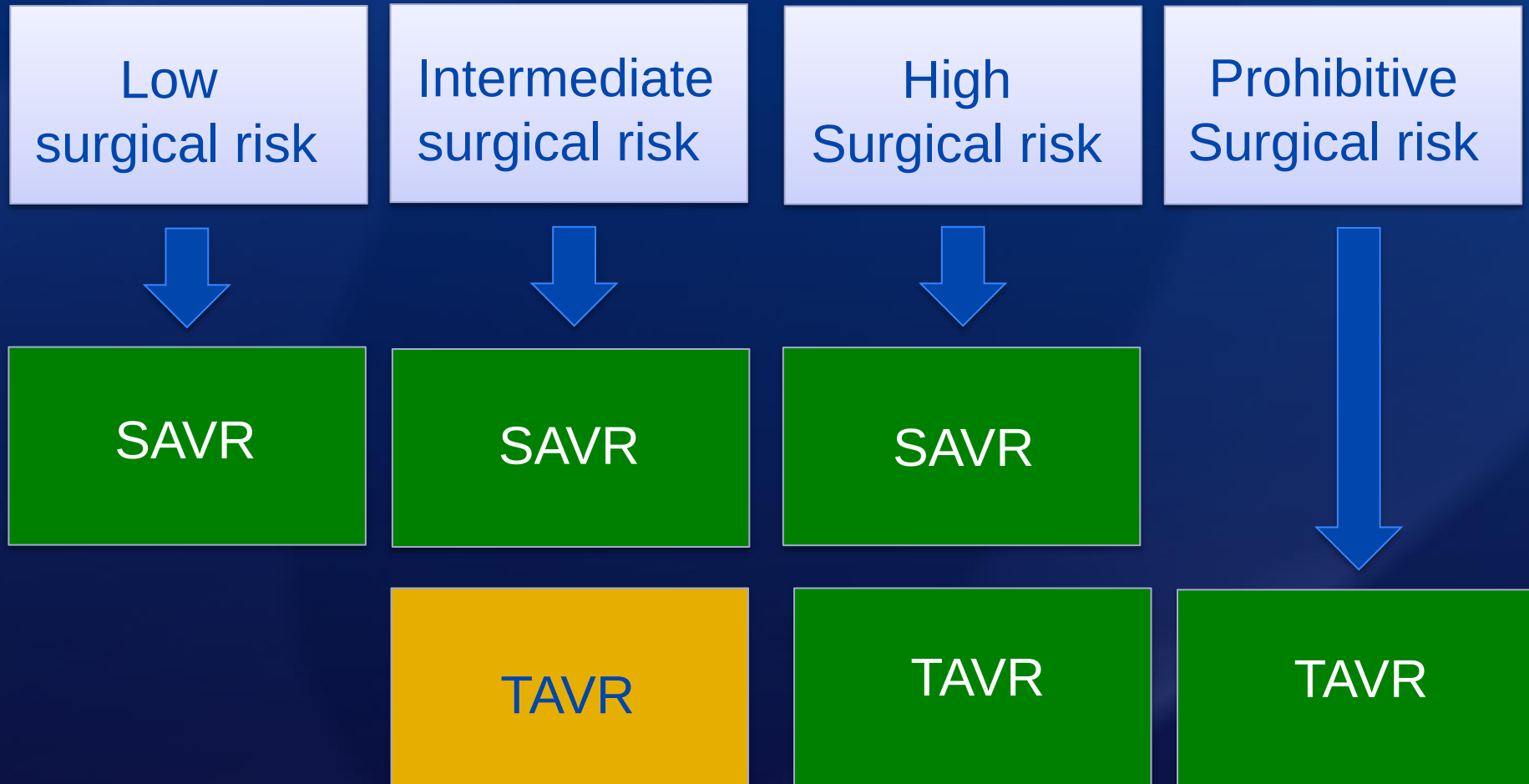
- Miscellaneous

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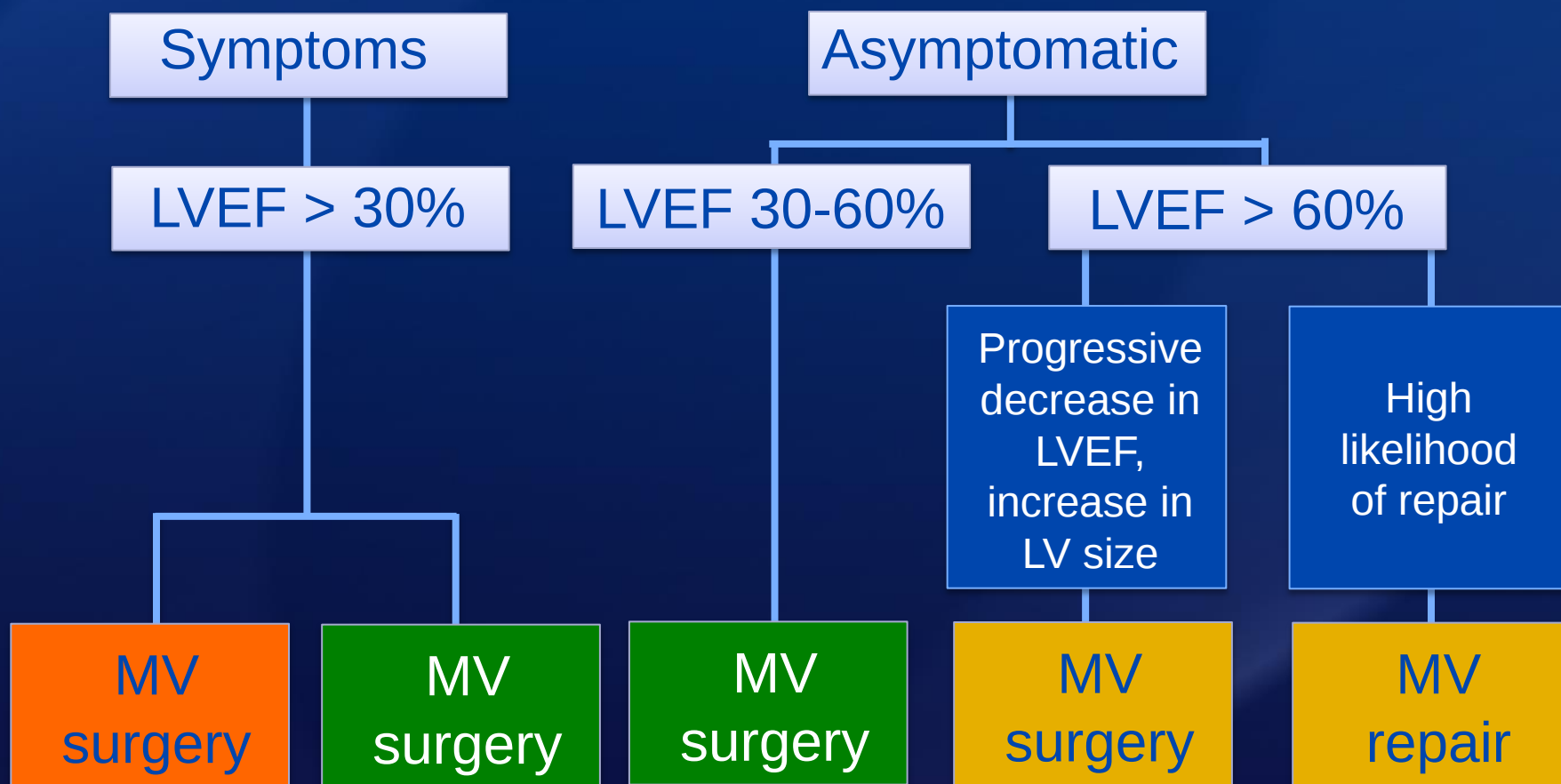
Severe Aortic Stenosis: SAVR vs. TAVR

2017 AHA/ACC Valvular Focused Update



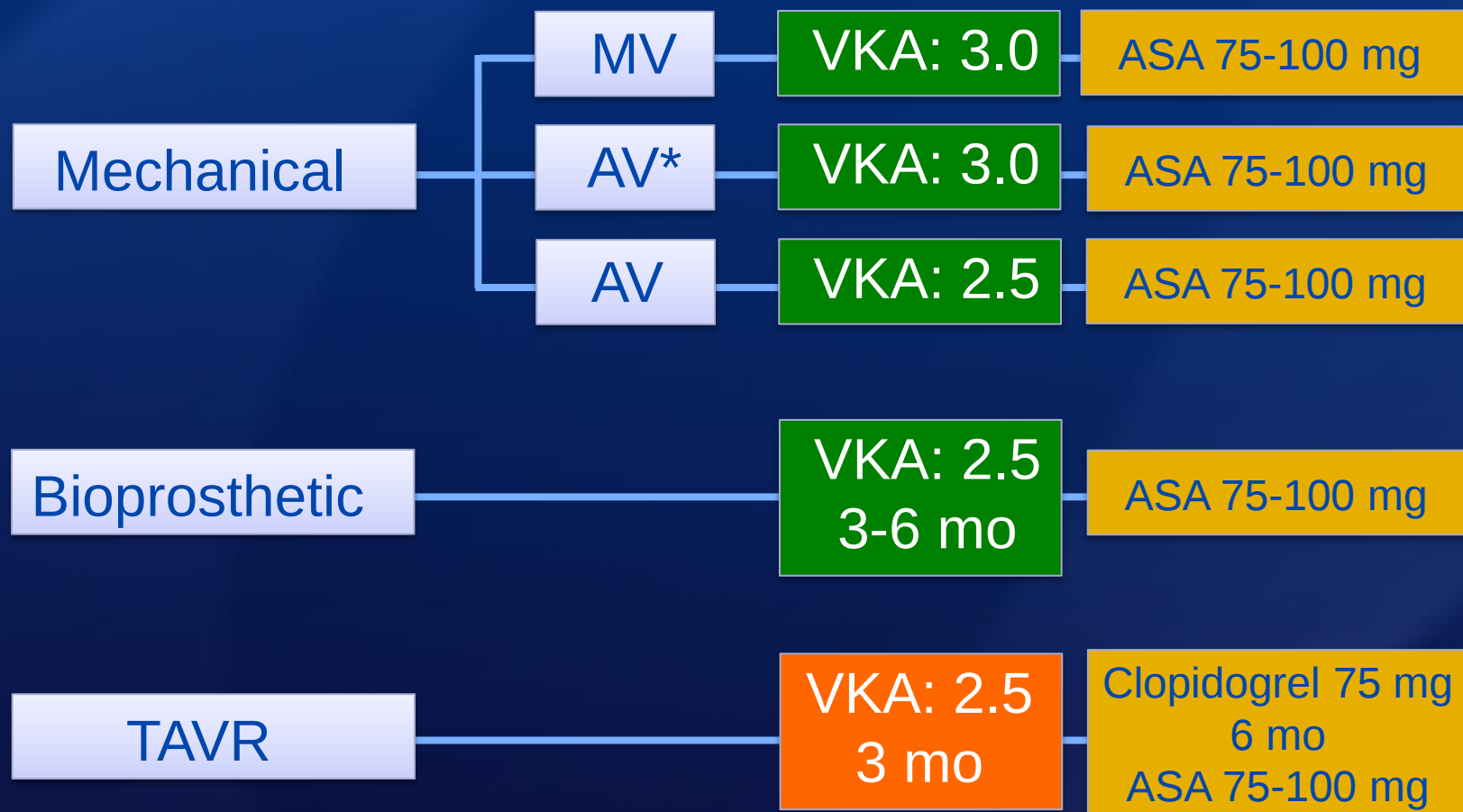
Mitral Regurgitation: Surgery

2017 AHA/ACC Valvular Focused Update



Mitral Regurgitation: Anticoagulation

2017 AHA/ACC Valvular Focused Update



*Risk factors for TE: AF, prior TE, LV dysfunction, hypercoagulable

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

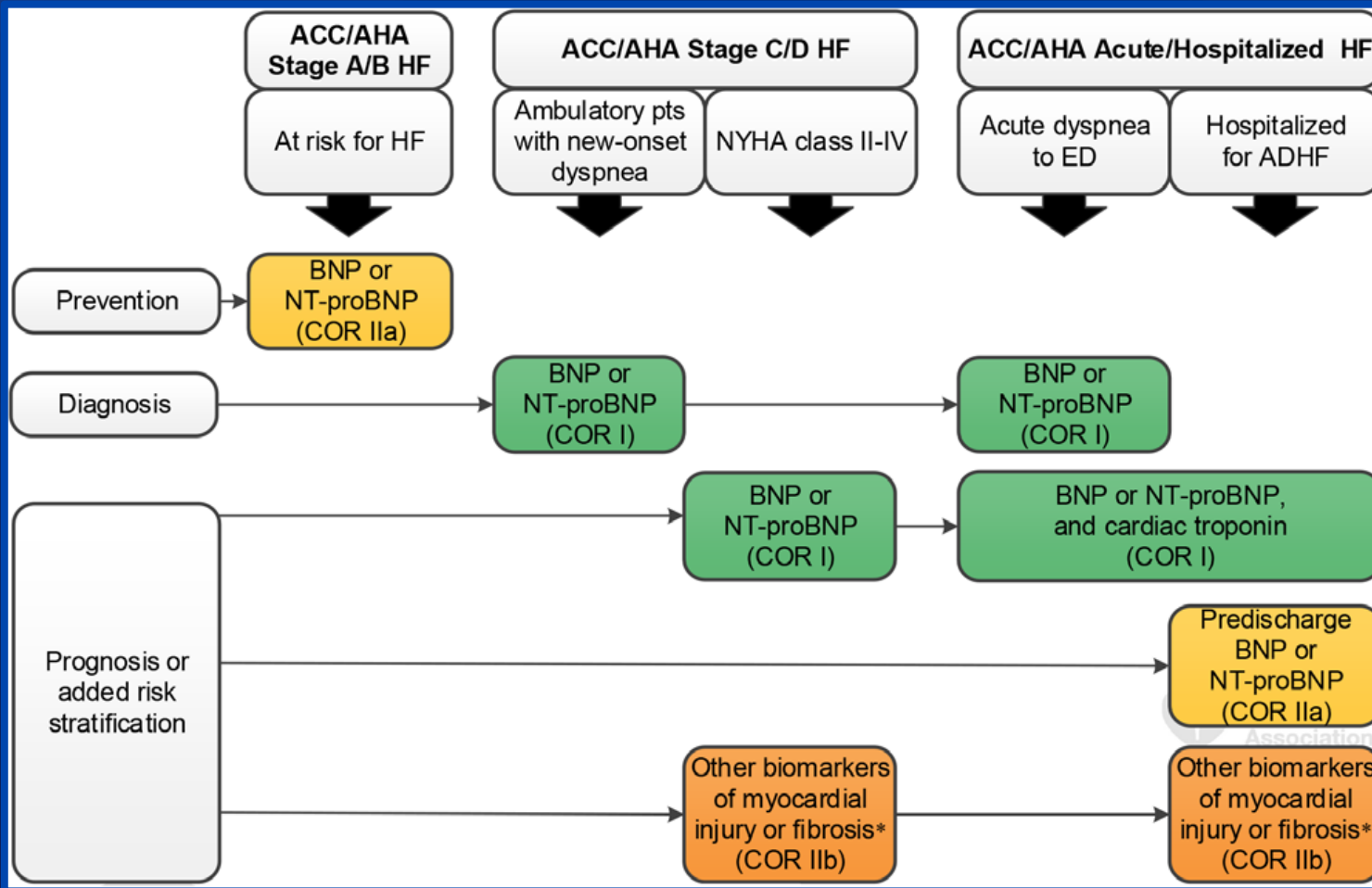
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 - Heart Failure
- Aortic Stenosis**
 - *TAVR being used in less sick patients*
 - *SAVR has a long Hx of success***Mitral regurgitation**
 - *Surgery in Asx patients particularly if repair possible***Antithrombotic Rx**
 - VKA
 - Mechanical valves
 - Bioprosthetic valve (3-6 mo)
 - TAVR (3 mo)
 - *ASA for all*
- Antithrombotic Rx
 - Miscellaneous

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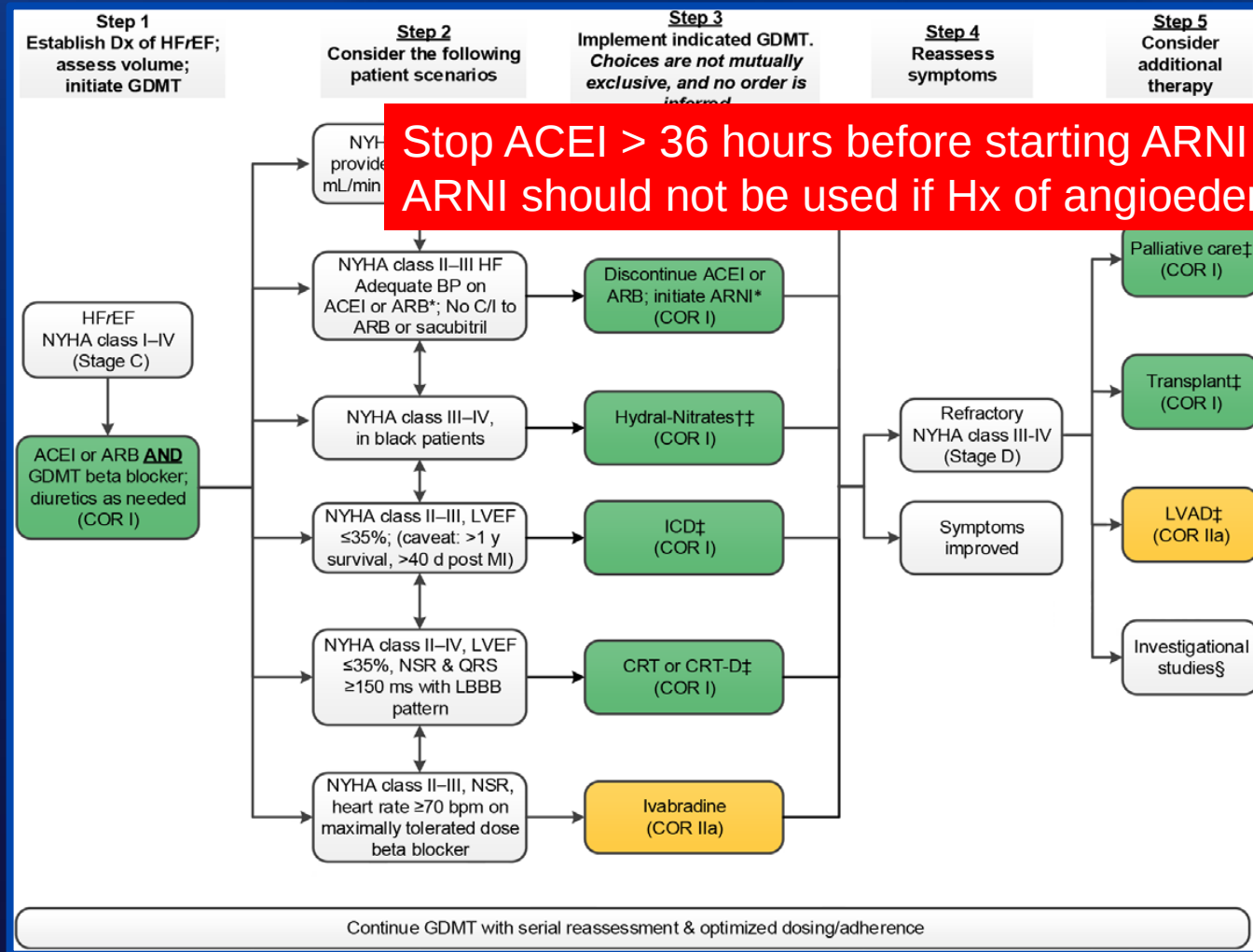
2017 ACC/AHA/HFSA Heart failure Guideline

Biomarkers



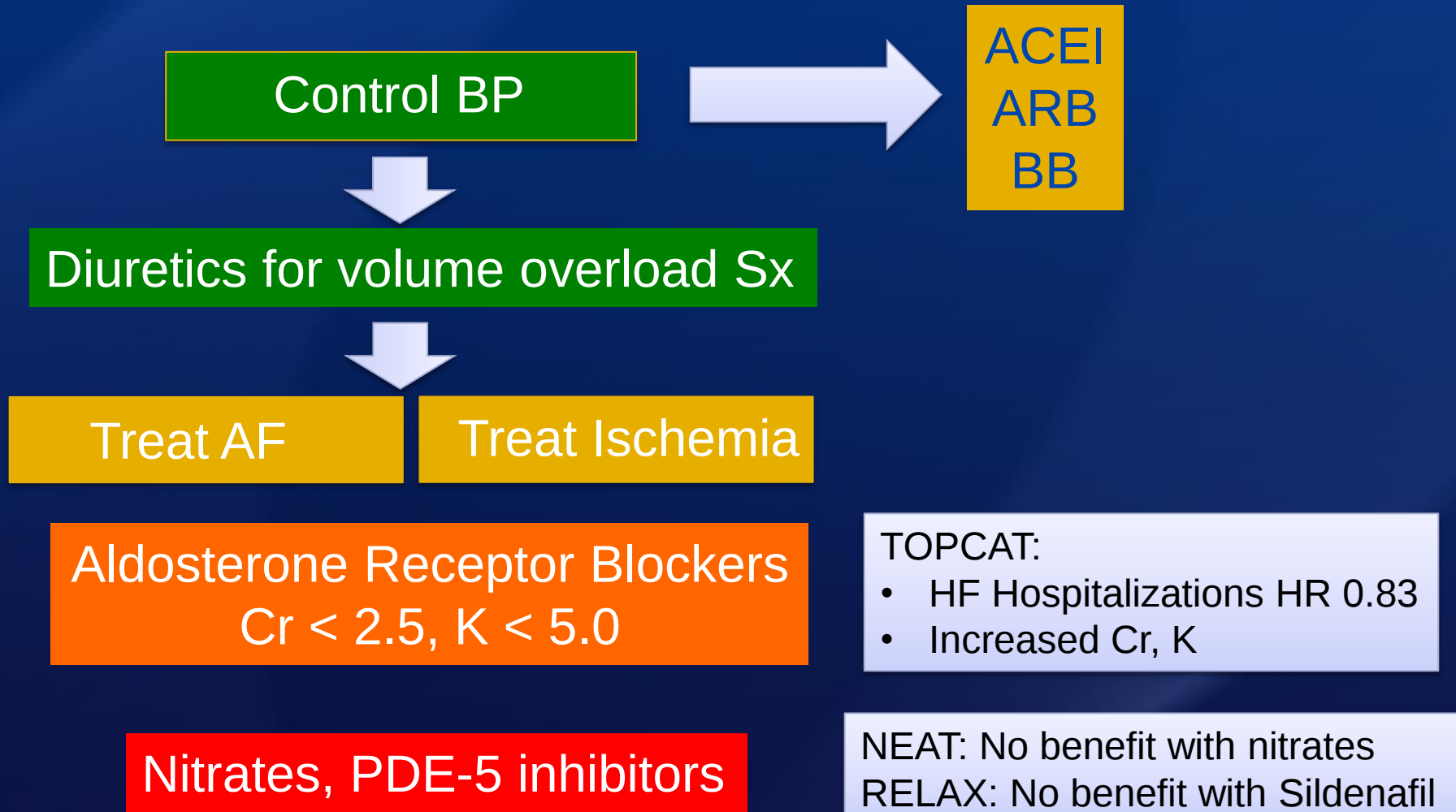
2017 ACC/AHA/HFSA Heart failure Guideline

Therapy HFrEF Stage C/D (LVEF < 40%)



2017 ACC/AHA/HFSA Heart failure Guideline

Therapy HFpEF Stage C



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 - Endocarditis
 - Vas
 - Syr
 - Pre
 - con
 - Lipi
 - Ant
 - Miscellaneous
- BNP for Dx/prognosis**

HFrEF

 - *BB*
 - *ACEI*
 - *Specific populations:*
 - Aldosterone antagonists
 - ARNI
 - Ivabradine
 - ICD, CRT, CCM?

HFpEF

 - *Rx HTN, AF, ischemia*

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Case #2

- 23 year old woman with depression and anxiety with a recent admission for “fainting spells” presents again to the ED with a recurrent spell.

Prognosis of Syncope: Framingham

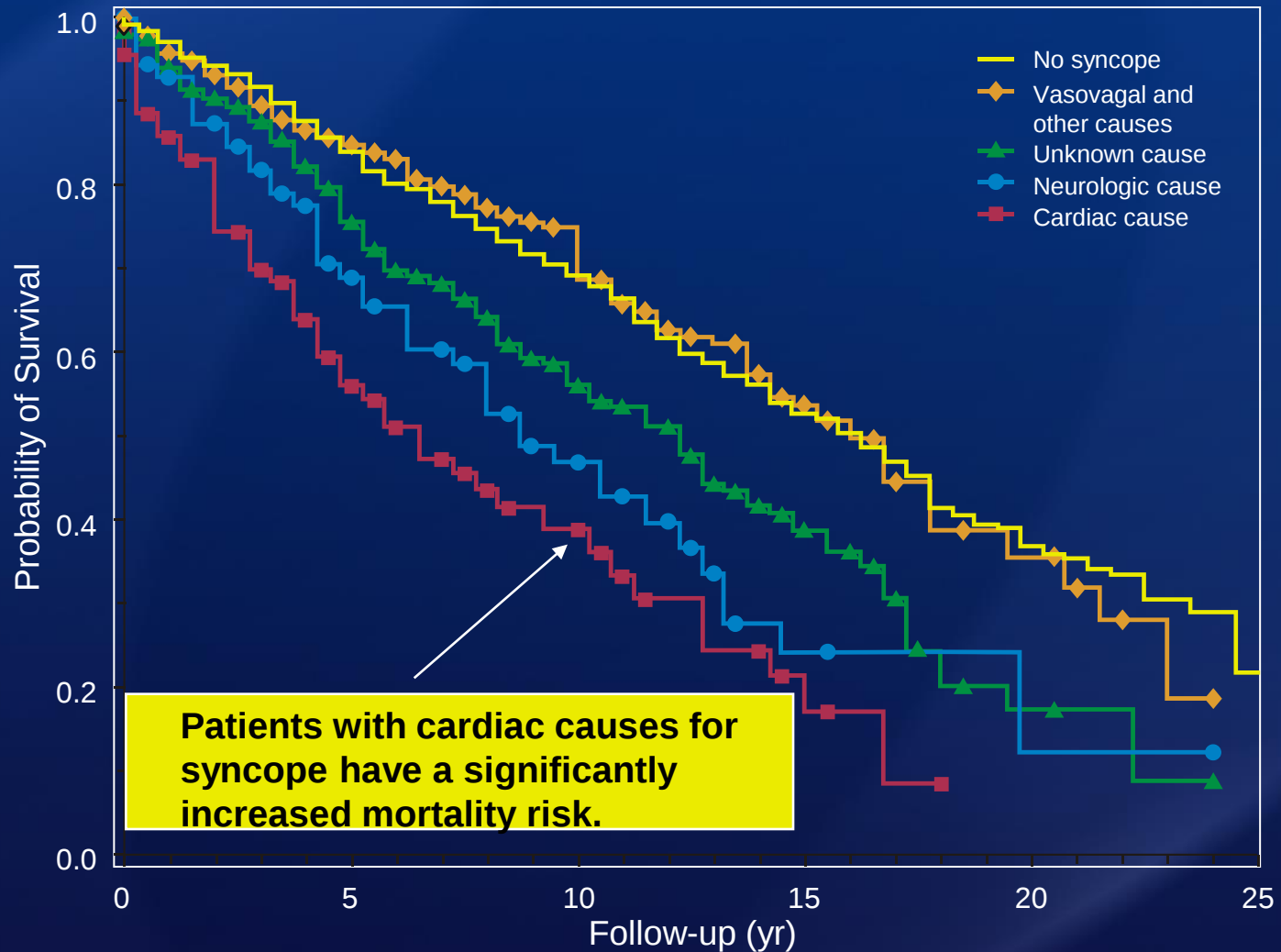
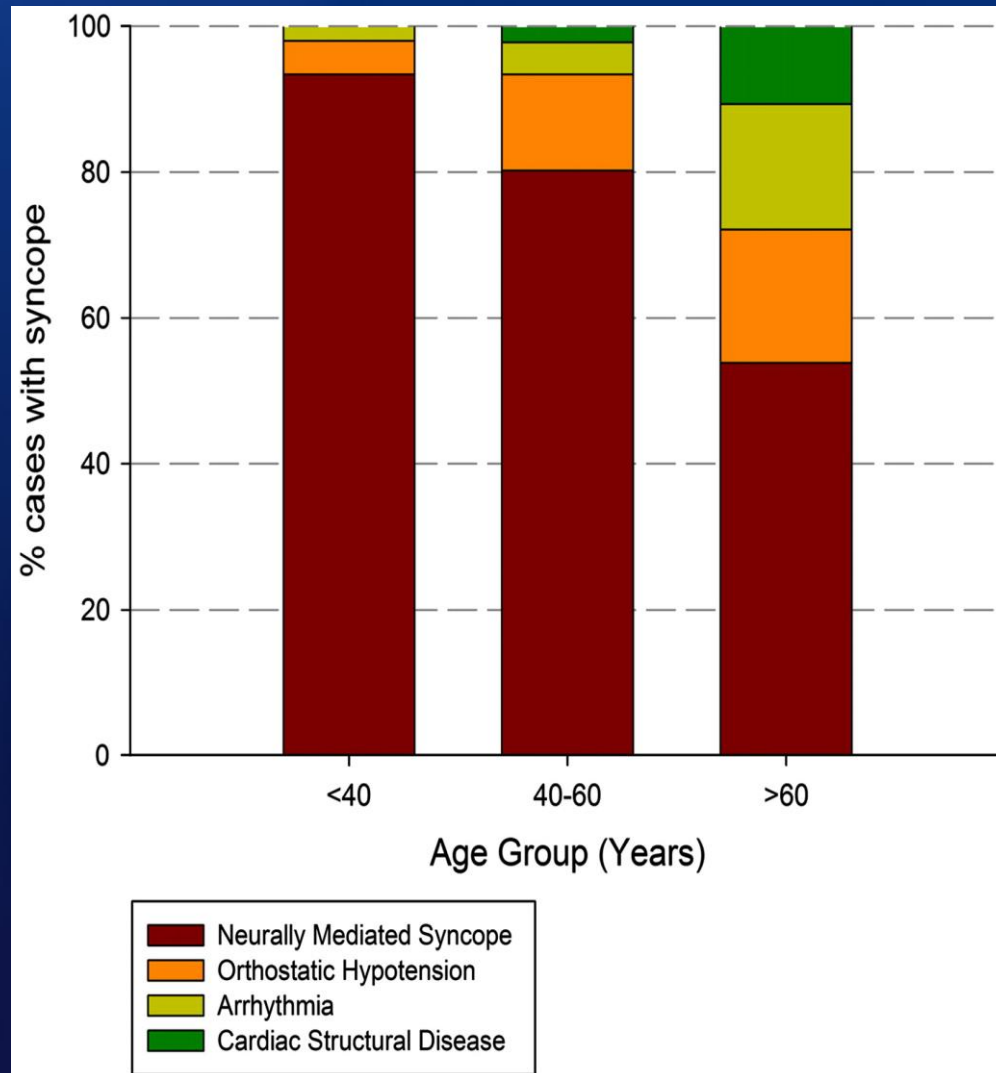


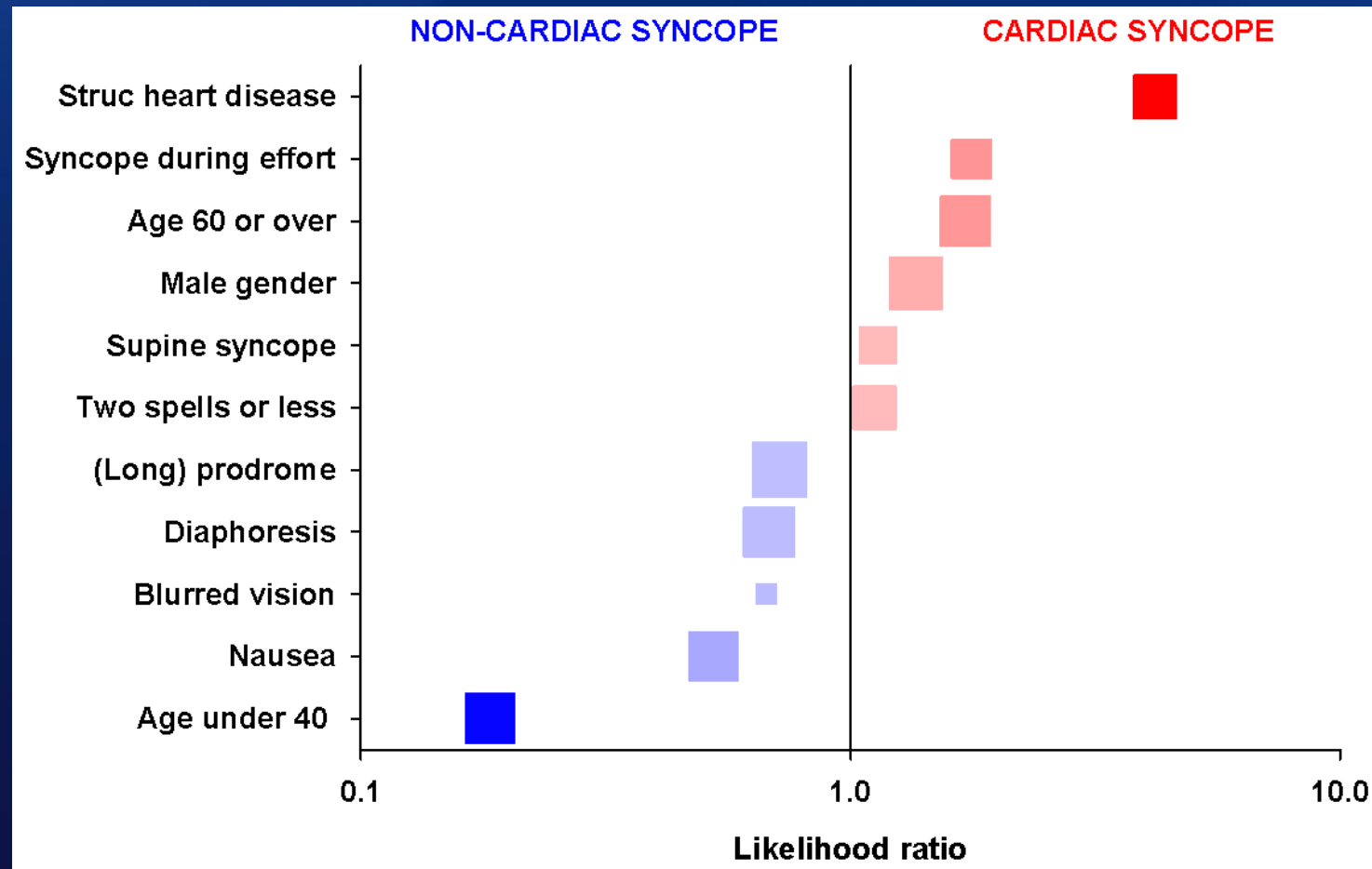
Figure 2. Overall Survival of Participants with Syncope, According to Cause, and Participants without Syncope.

$P < 0.001$ for the comparison between participants with and those without syncope. The category "Vasovagal and other causes" includes vasovagal, orthostatic, medication-induced, and other, infrequent causes of syncope.

Etiology of Syncope and Age



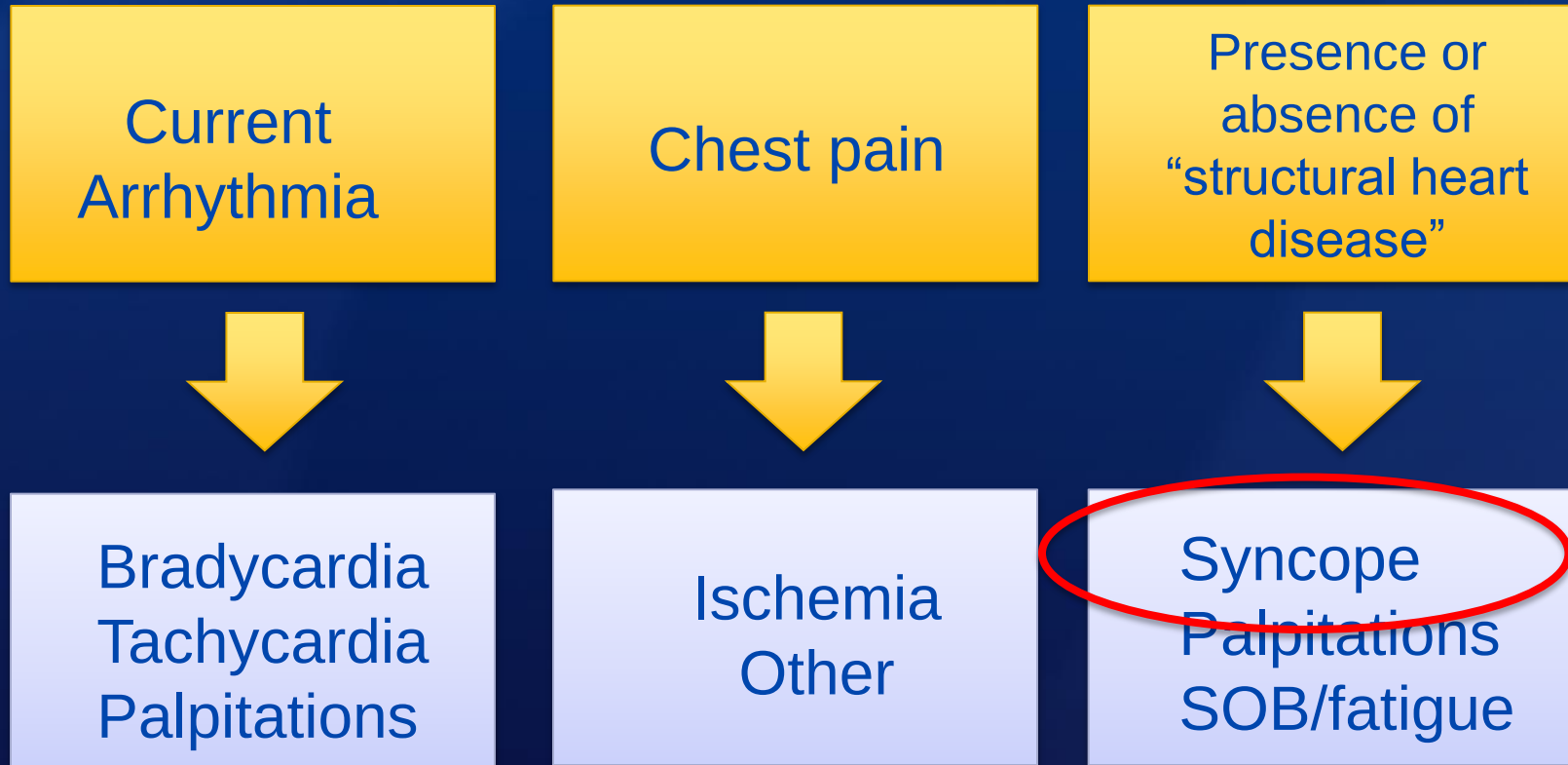
Identifying cardiac syncope based on clinical history



Evaluation of syncope

- History:
 - Age
 - Comorbidities
 - Structural heart disease?
 - Family history?
- Physical examination:
 - VS (orthostatics, CSM?)
 - Structural heart disease?
- ECG:

Clinical Use of the Electrocardiogram

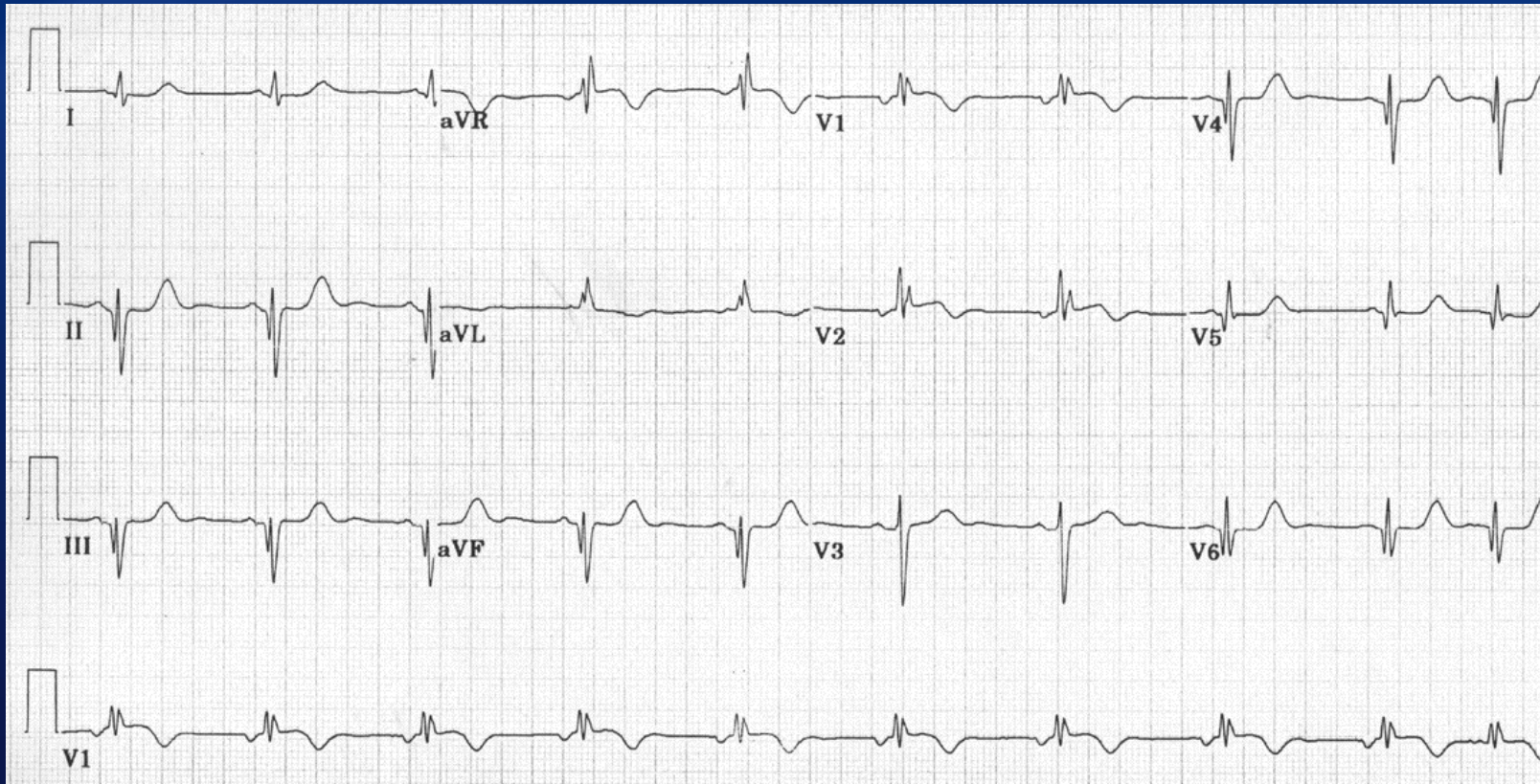


Evaluation of Syncope

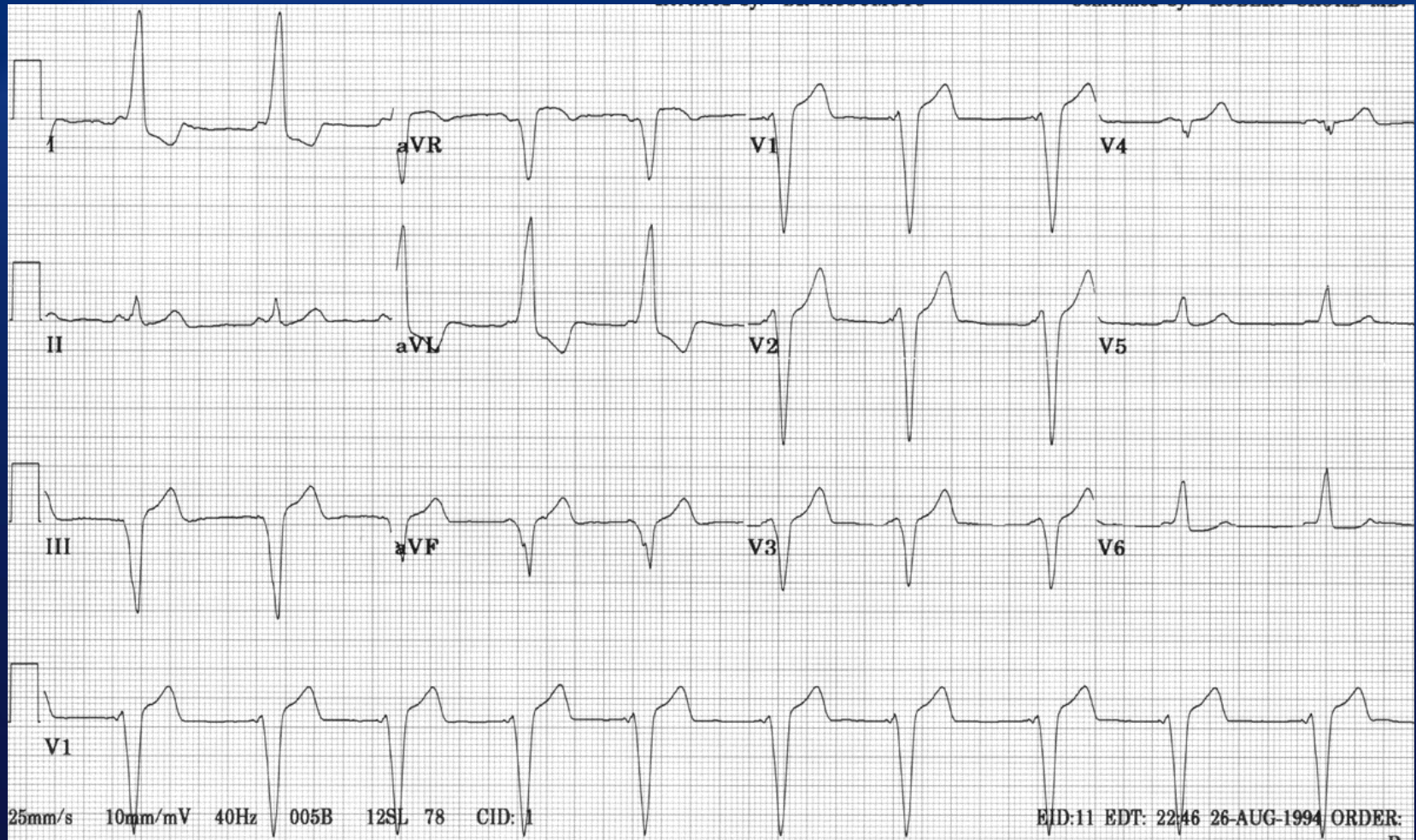
2017 ACC/AHA/HRS Syncope Guidelines

Initial Evaluation
History, physical examination, ECG
Class I

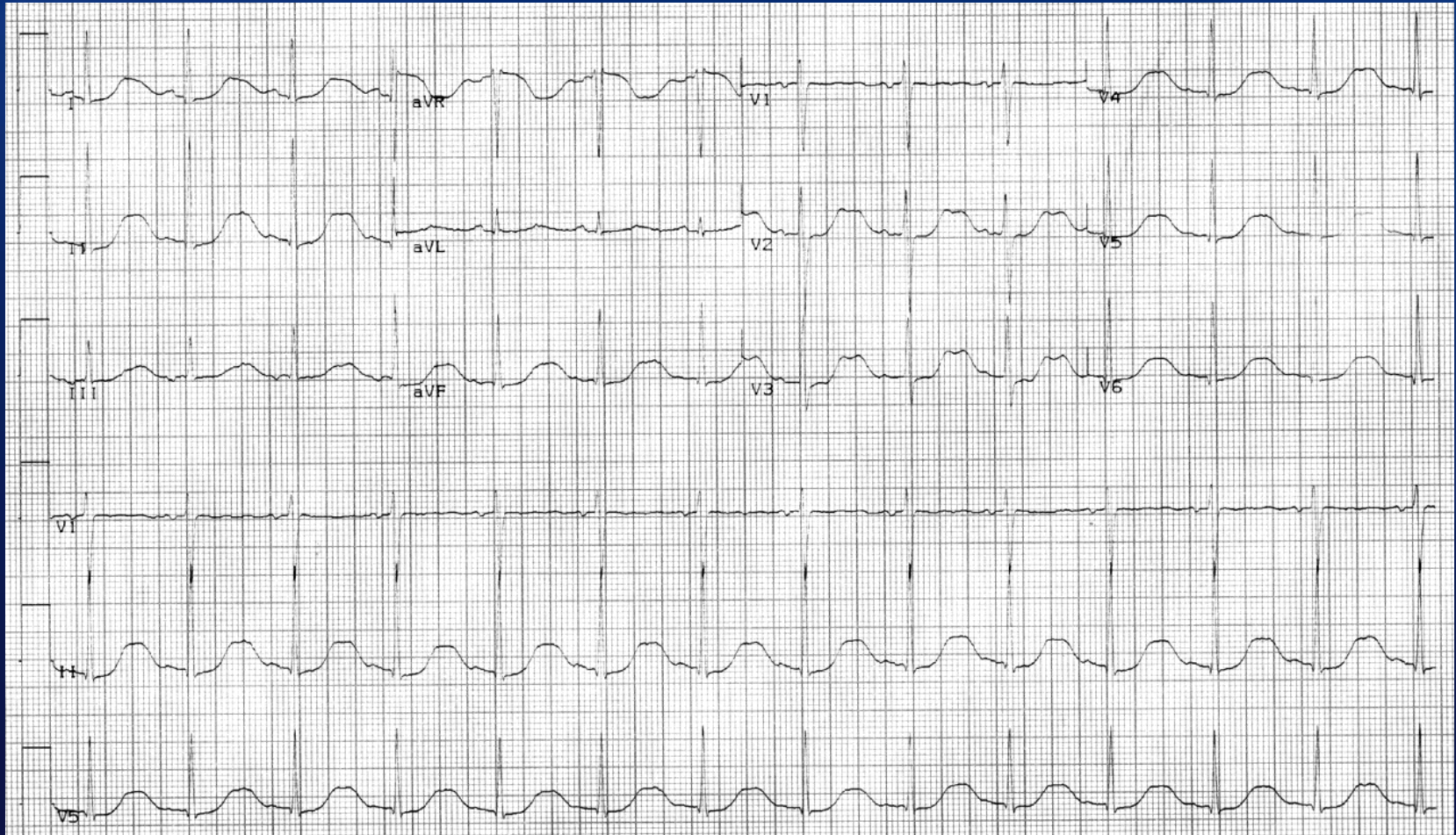
Case #2



“Things” that suggest tachycardia: *Wolff Parkinson White Syndrome*

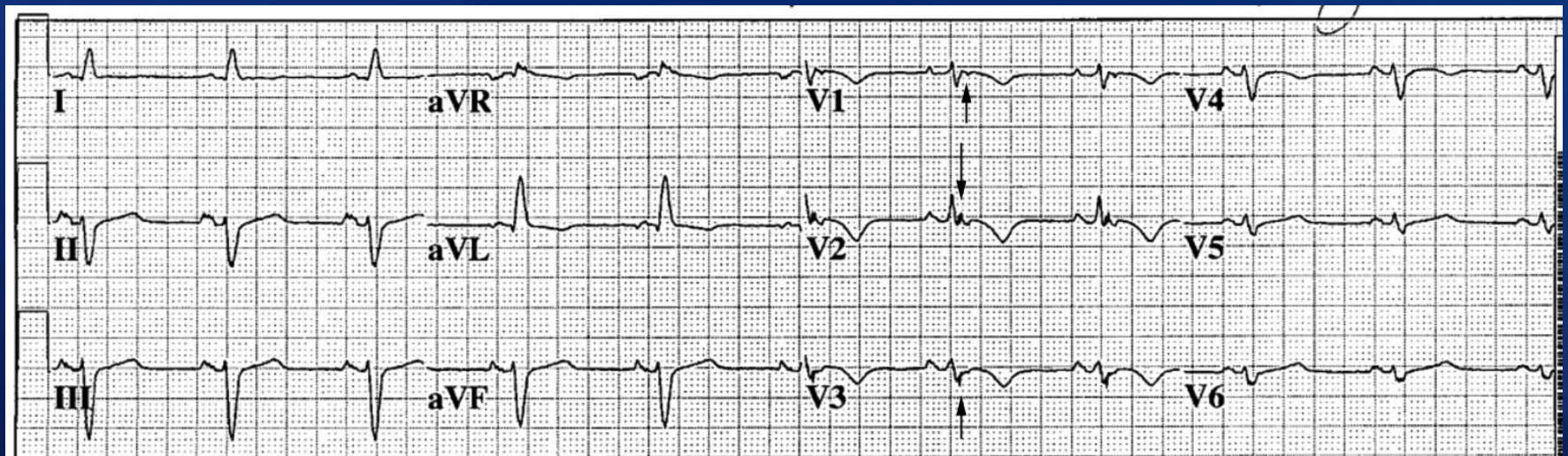


“Things” that suggest tachycardia: *Long QT Syndrome*

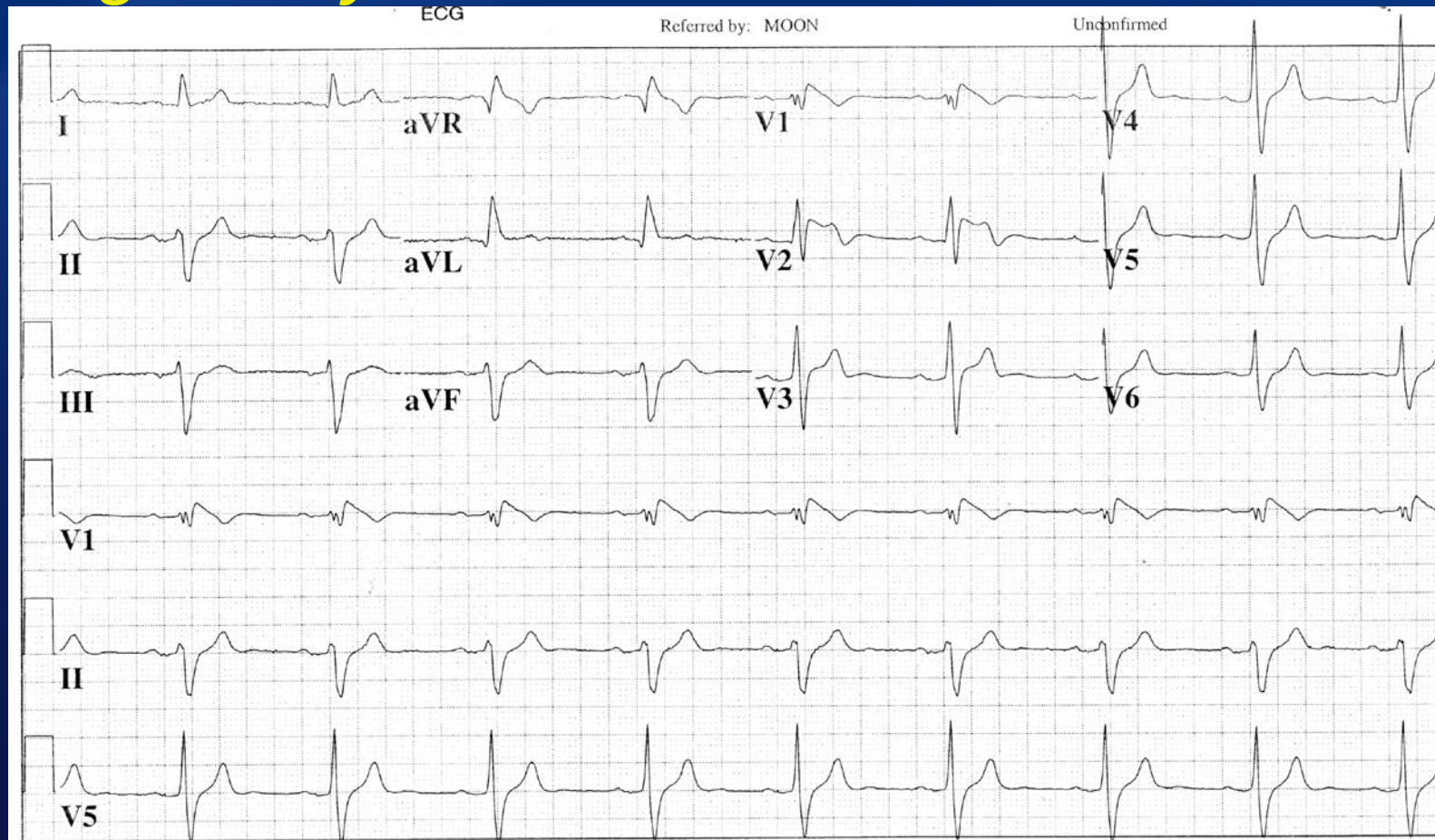


Kusumoto FM. ECG Interpretation: From Pathophysiology to Clinical Application 2009

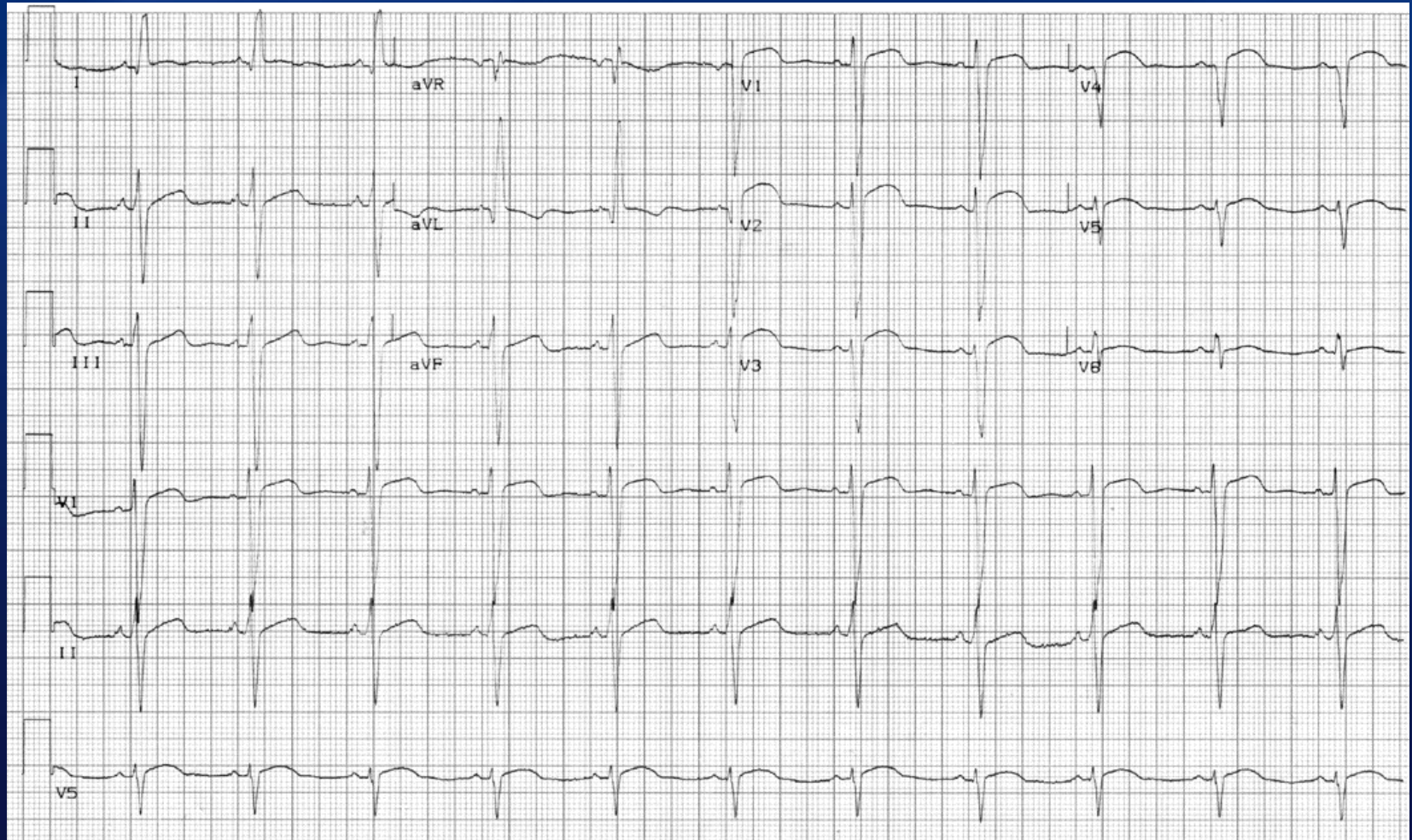
“Things” that suggest tachycardia: *Arrhythmogenic right ventricular cardiomyopathy*



“Things” that suggest tachycardia: *Brugada Syndrome*

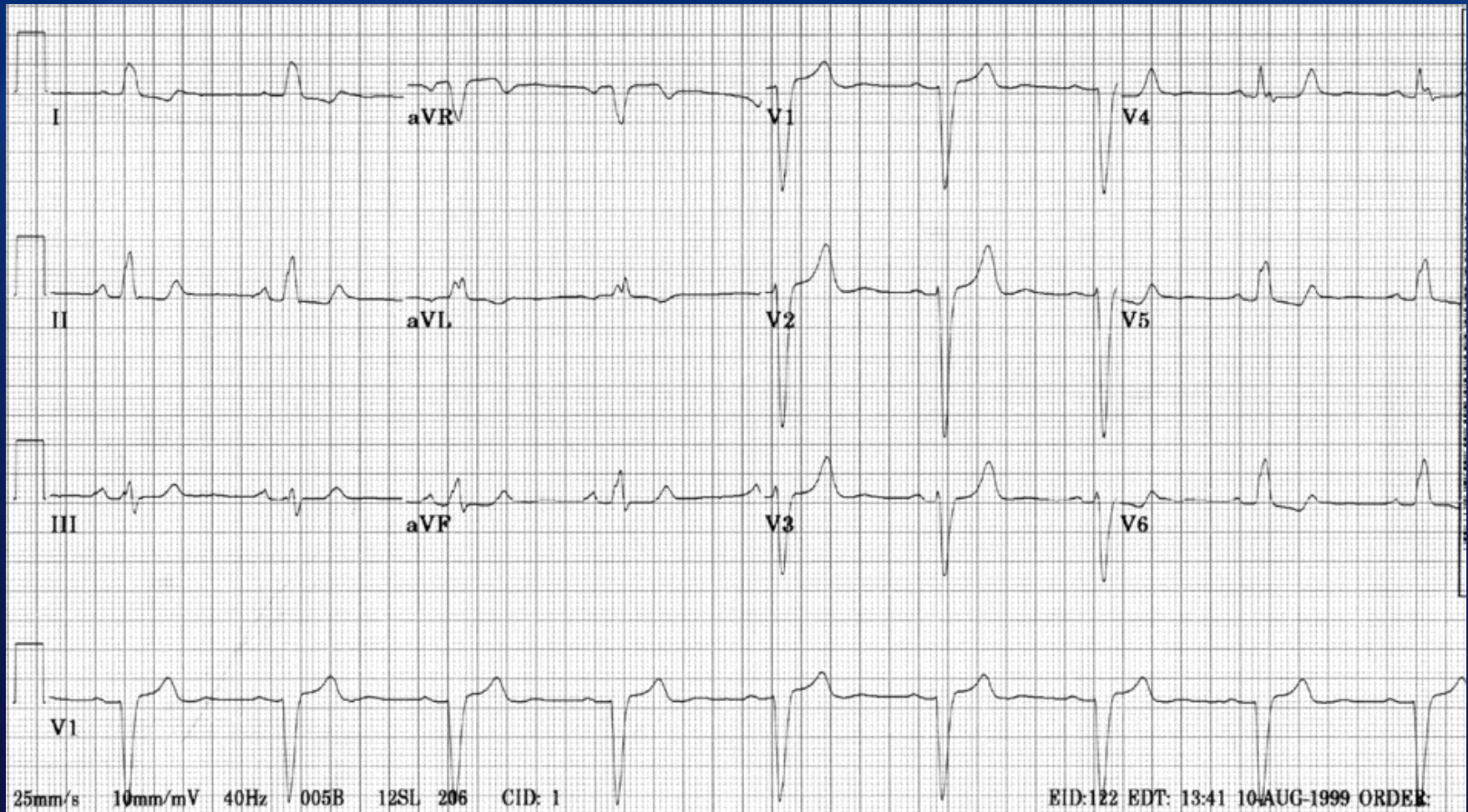


“Things” that suggest tachycardia: *Myocardial Infarction*



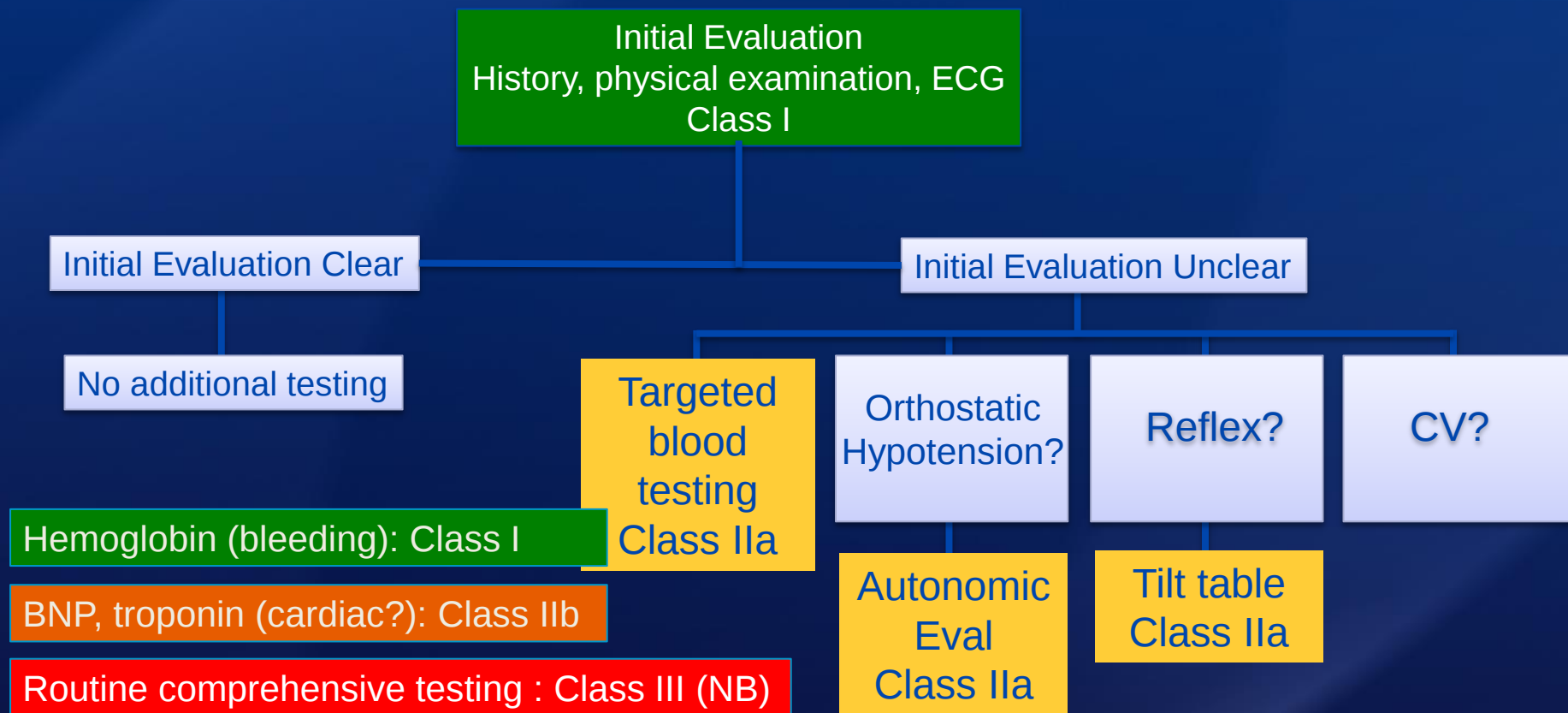
“Things” that suggest bradycardia

Abnormal atrioventricular or intraventricular conduction



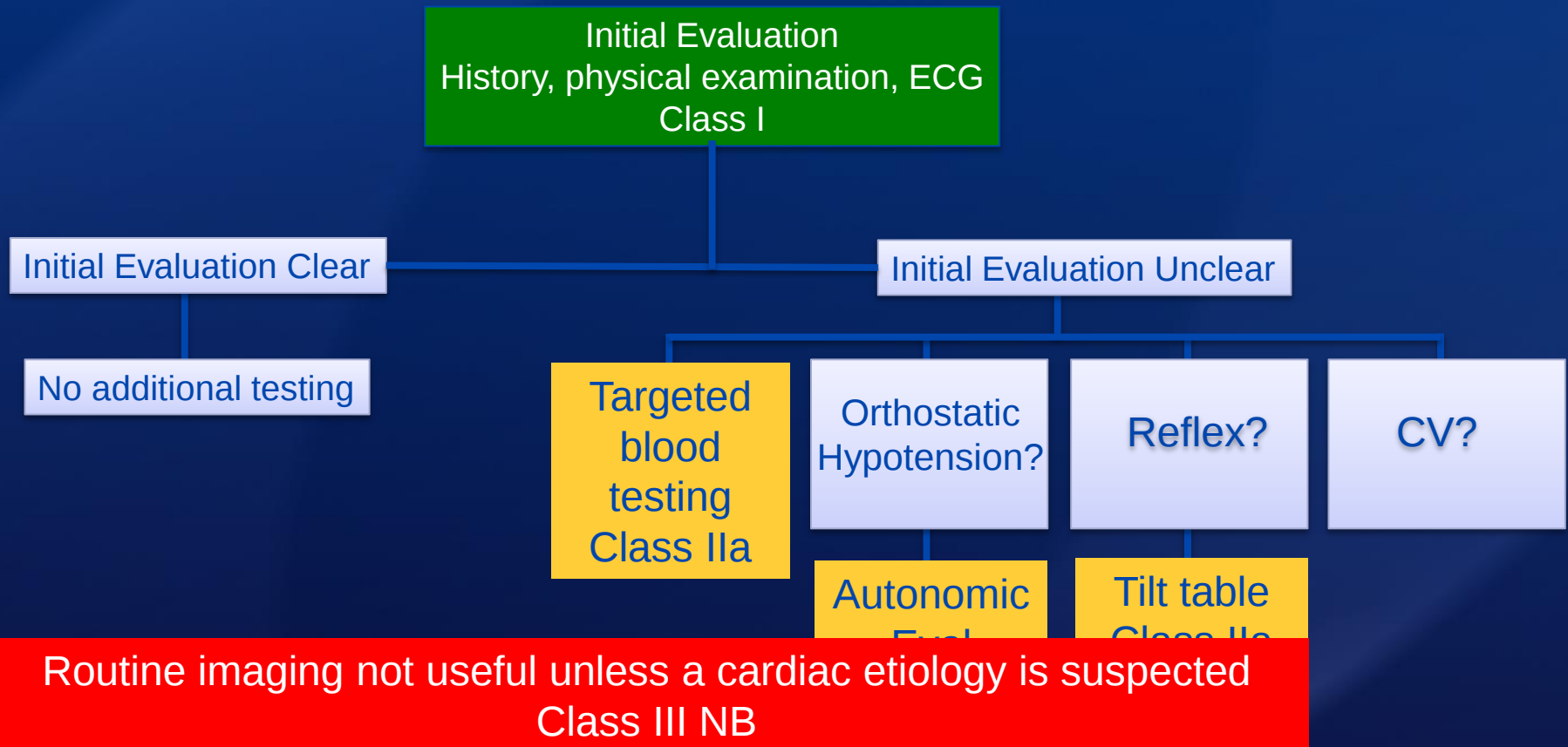
Evaluation of Syncope

2017 ACC/AHA/HRS Syncope Guidelines



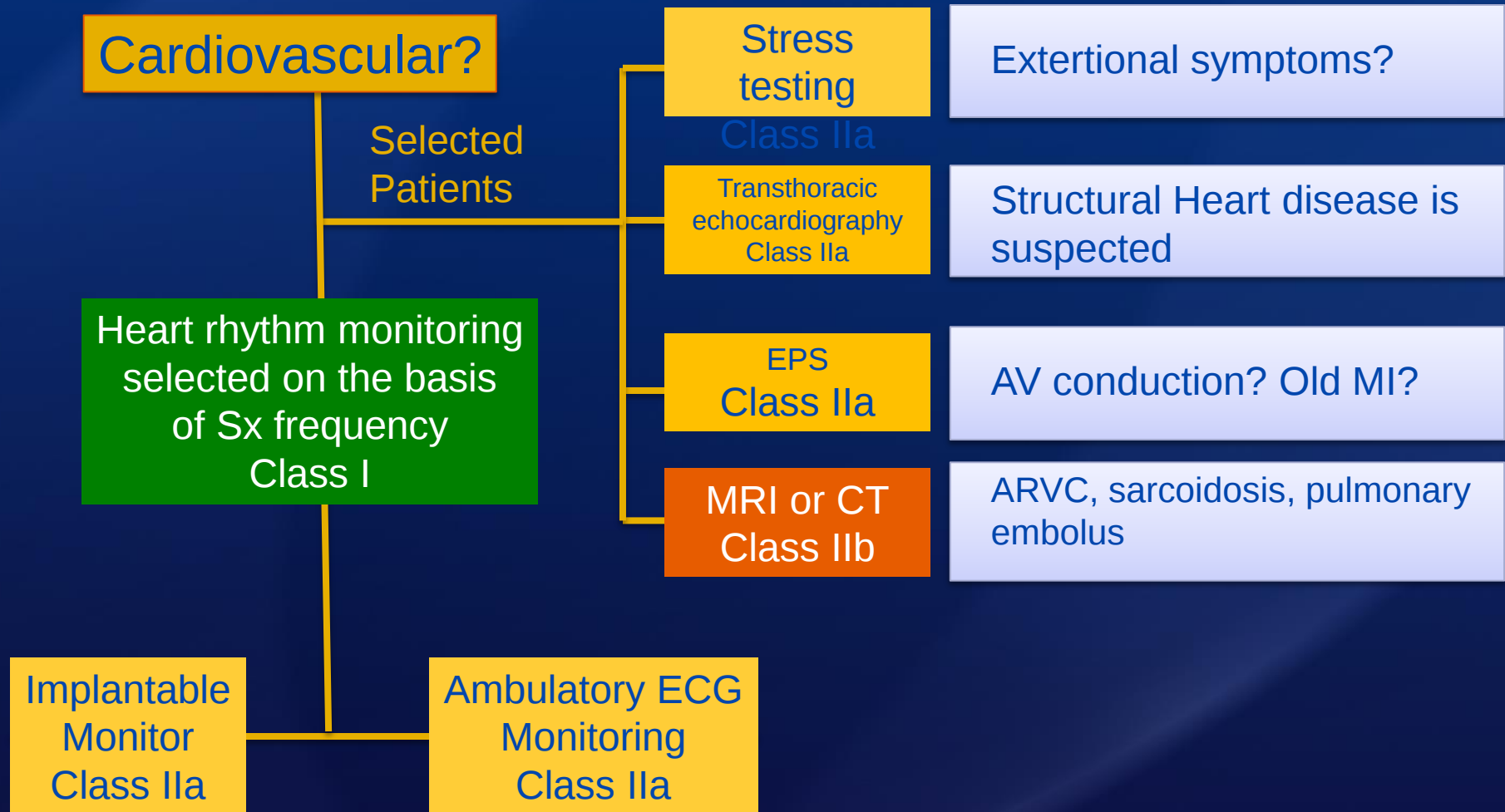
Evaluation of Syncope

2017 ACC/AHA/HRS Syncope Guidelines



Evaluation of Syncope

2017 ACC/AHA/HRS Syncope Guidelines



For patients with syncope, ECG correlation
is critical:
Technology chosen on the frequency of episodes



ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

Focus on identifying whether a CV cause is present

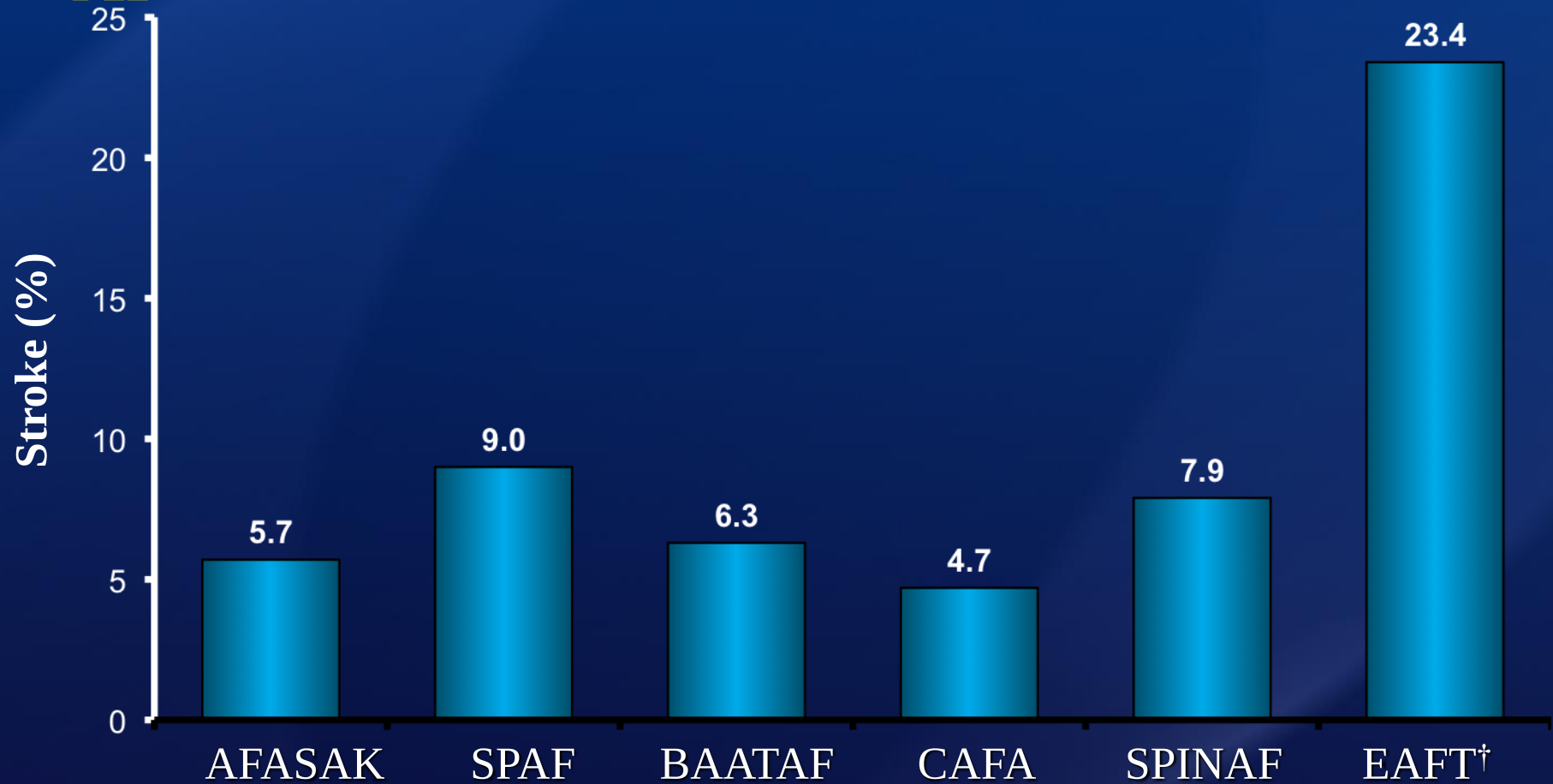
- *History*
 - *Physical examination*
 - *ECG*
 - *Additional testing?*
- Ischemic Heart Disease
 - Dysrhythmias
 - Congenital heart disease
 - Valvular heart disease
 - Heart Failure
 - Syncope
 - Preoperative consultation
 - Lipid disorders
 - Antithrombotic Rx
 - Miscellaneous

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

- Hypertension
- Pericardial disease
- Ischemic Heart Disease
- Dysrhythmias
- Congenital disease
- Valvular heart disease
- Heart Failure
- Endocarditis
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Atrial fibrillation

Stroke Rates in Placebo-Treated Patients With AF*



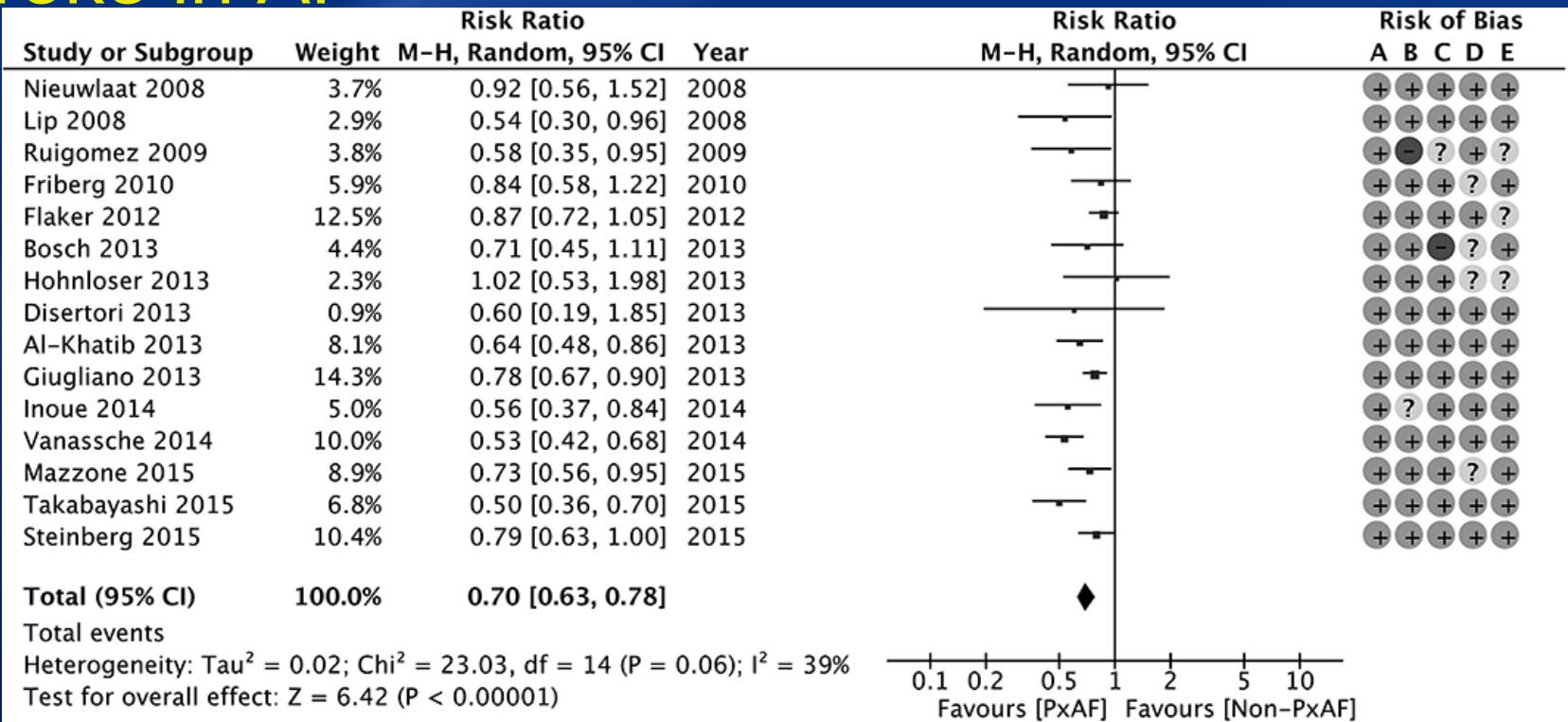
*This represents patients who are not anticoagulated; †Secondary prevention.

Hart et al. *Ann Intern Med.* 1999;131:492-501.

Stroke in AF

Pa

Stroke Rate (%/Year)



	PAF	NonPAF
Incidence of stroke	1.6% (1.3%-2.0%)	2.3% (2.0%-2.7%)

BAATAF

SPAF

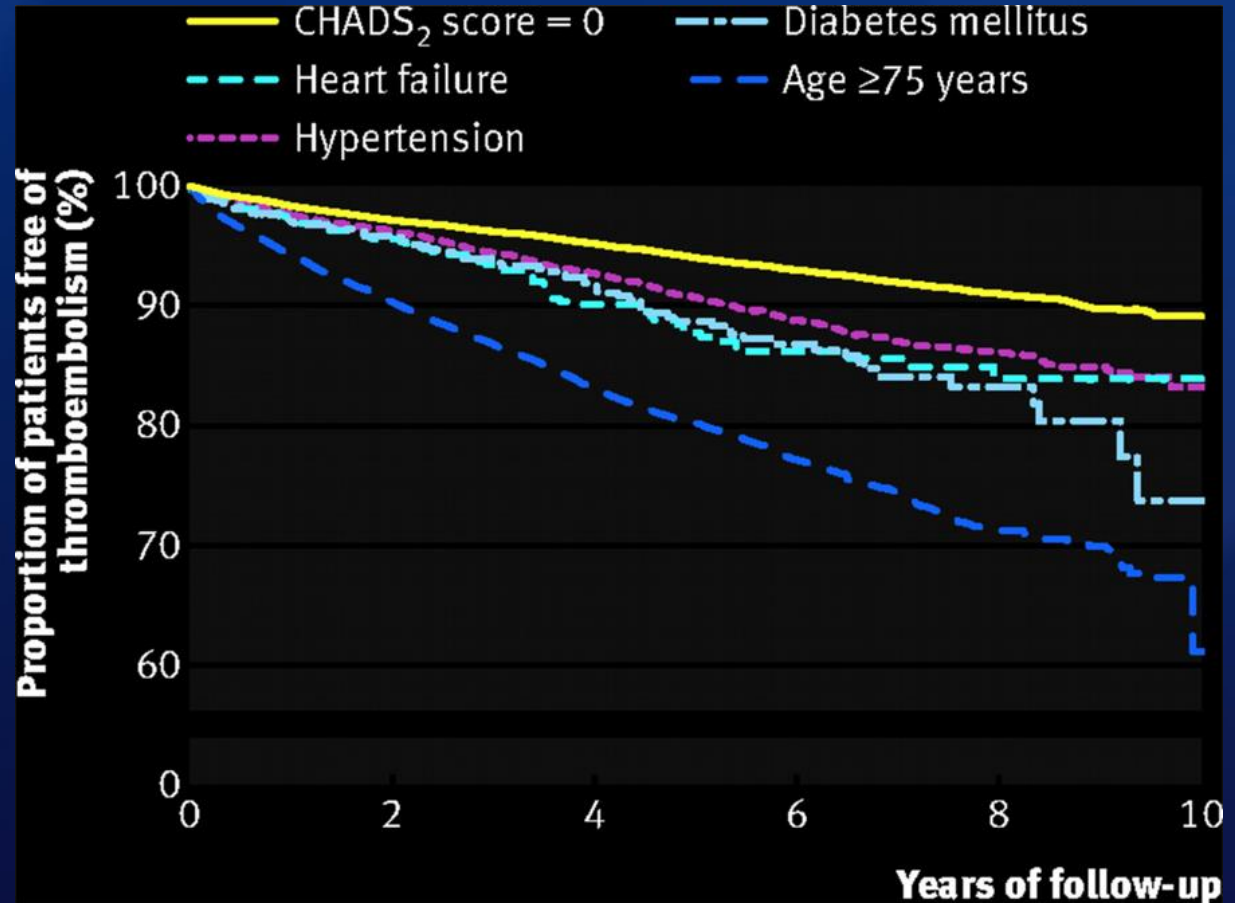
Petersen

Roy

Study

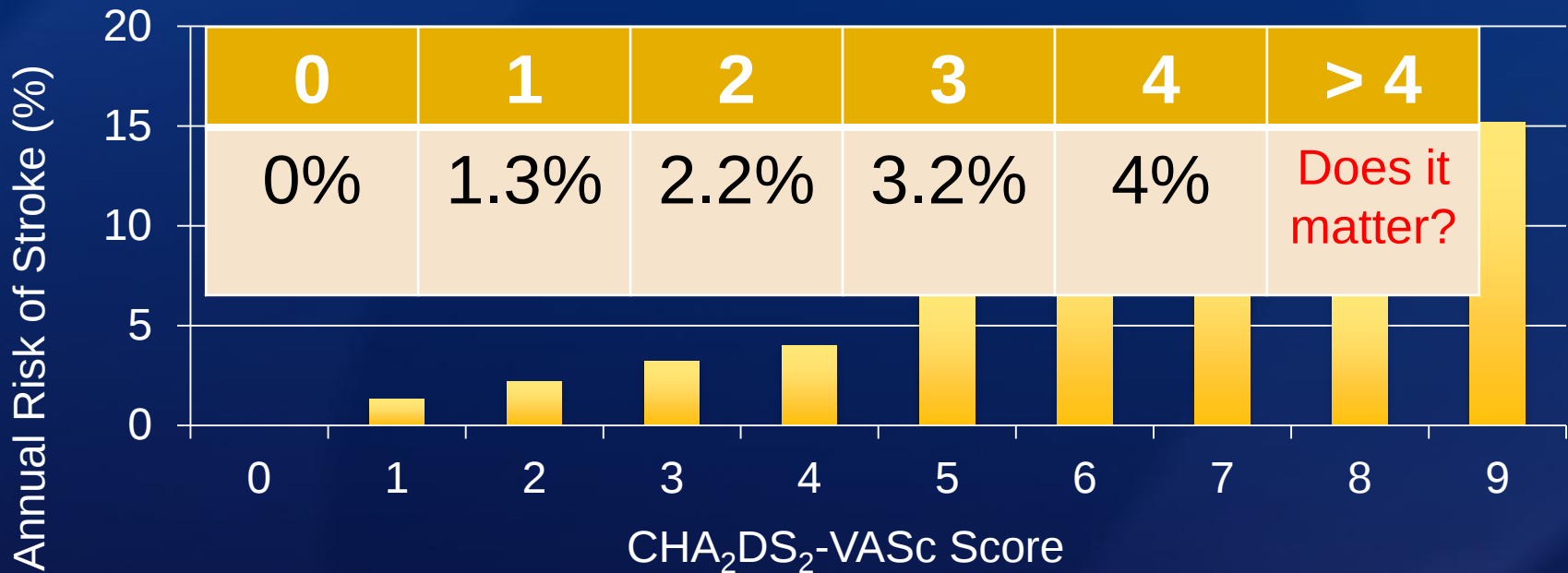
Relative contributions of different risk factors to the CHADS₂ score (“NIH”)

- 73,558 patients with AF not treated with OAC (Denmark)



Olesen et al BMJ 2011;342:d124

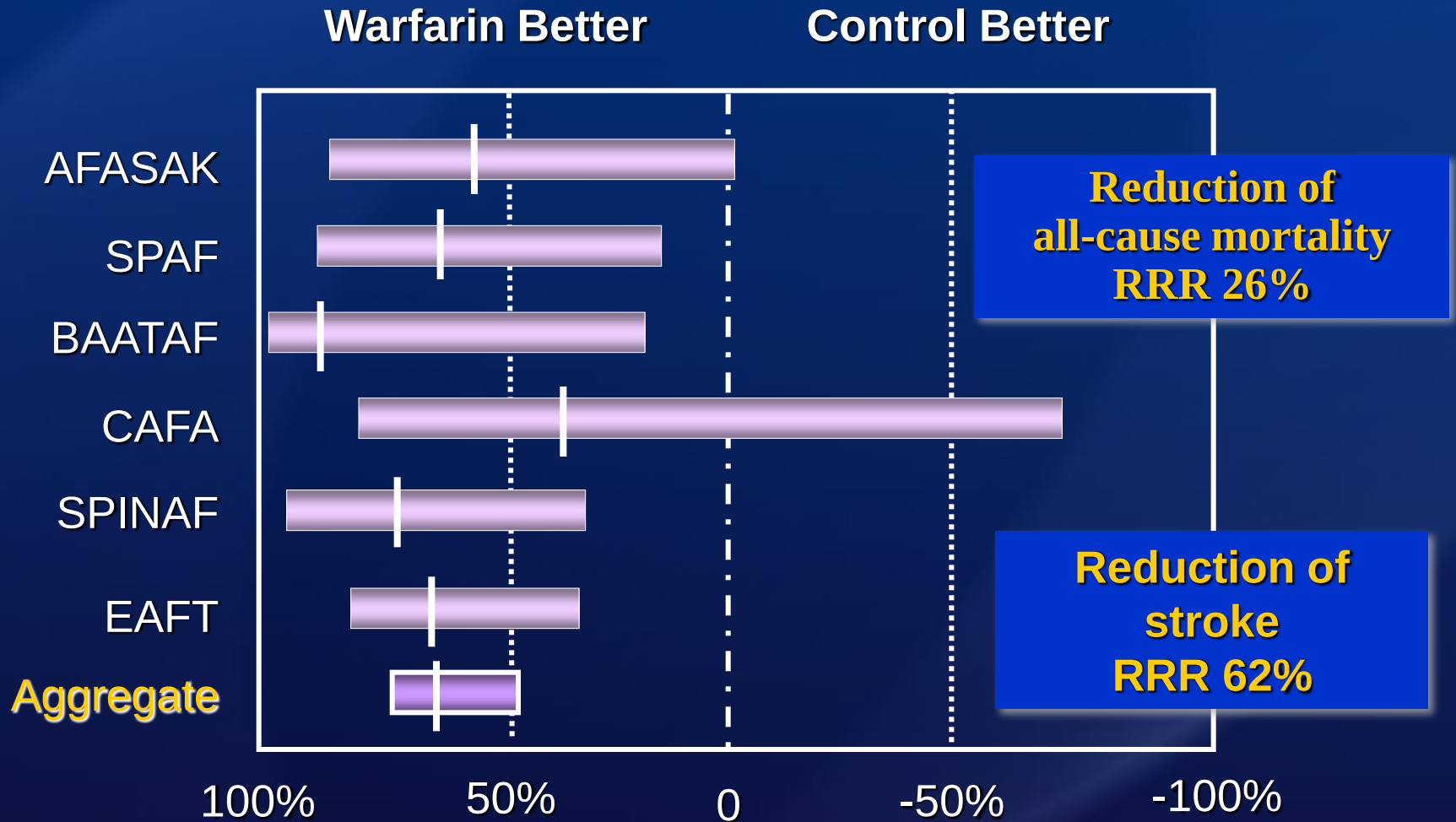
Relationship Between the CHA₂DS₂-VASc Score and the Risk of Stroke



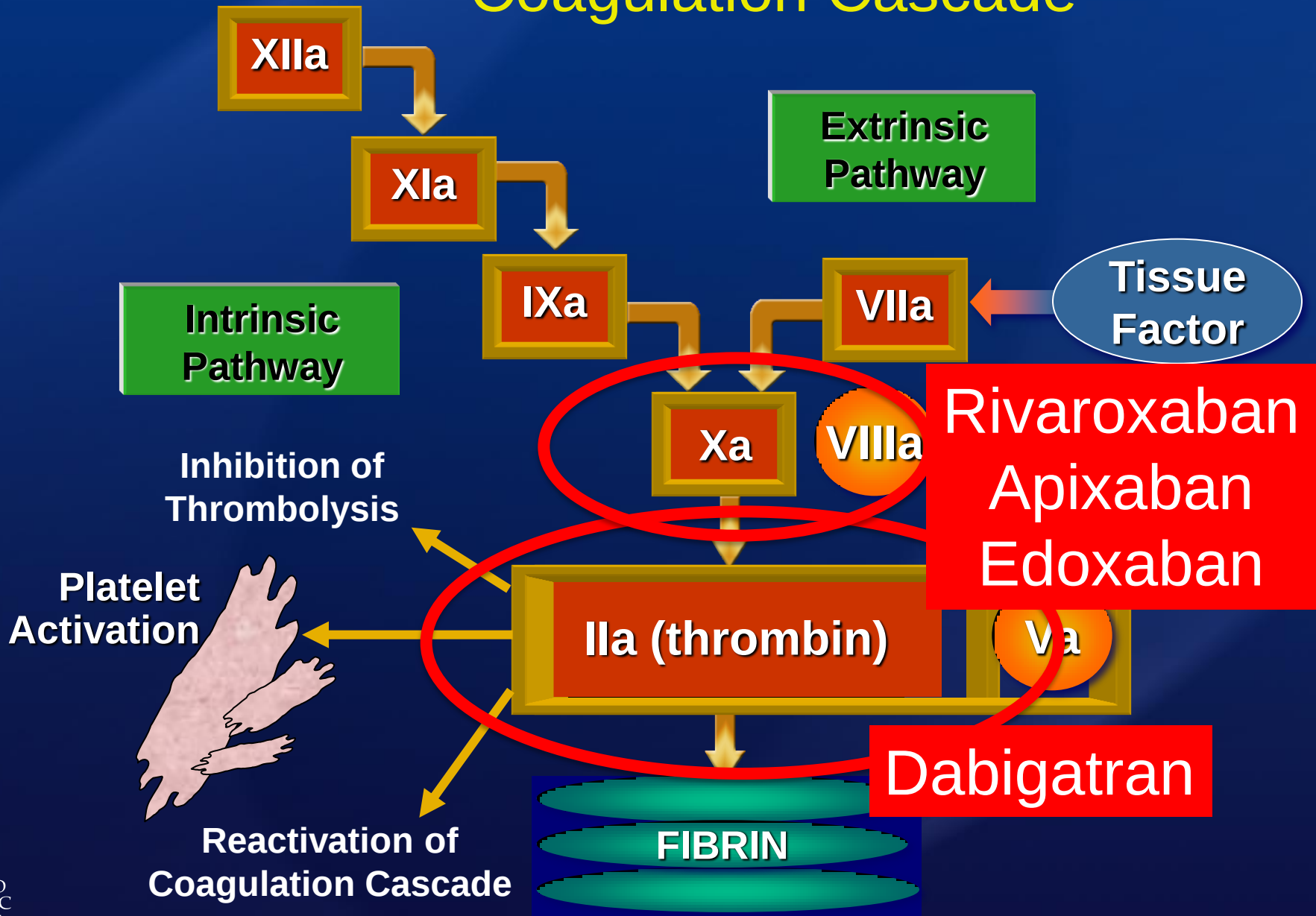
- CHA₂DS₂-VASc: Weights age, adds vascular disease and gender
- Greater granularity at “low and moderate” risk

Anticoagulation in AF

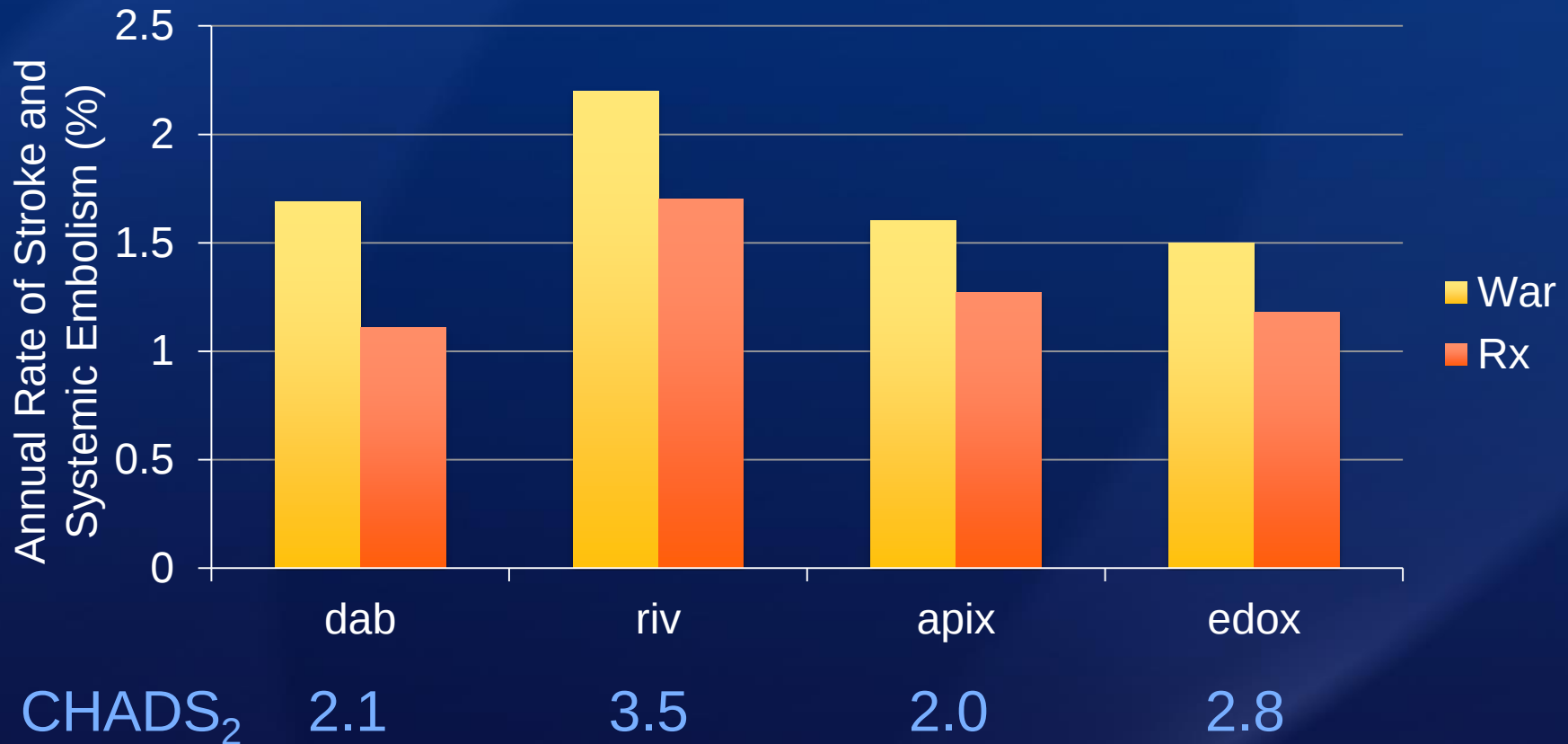
Stroke Risk Reductions



Coagulation Cascade

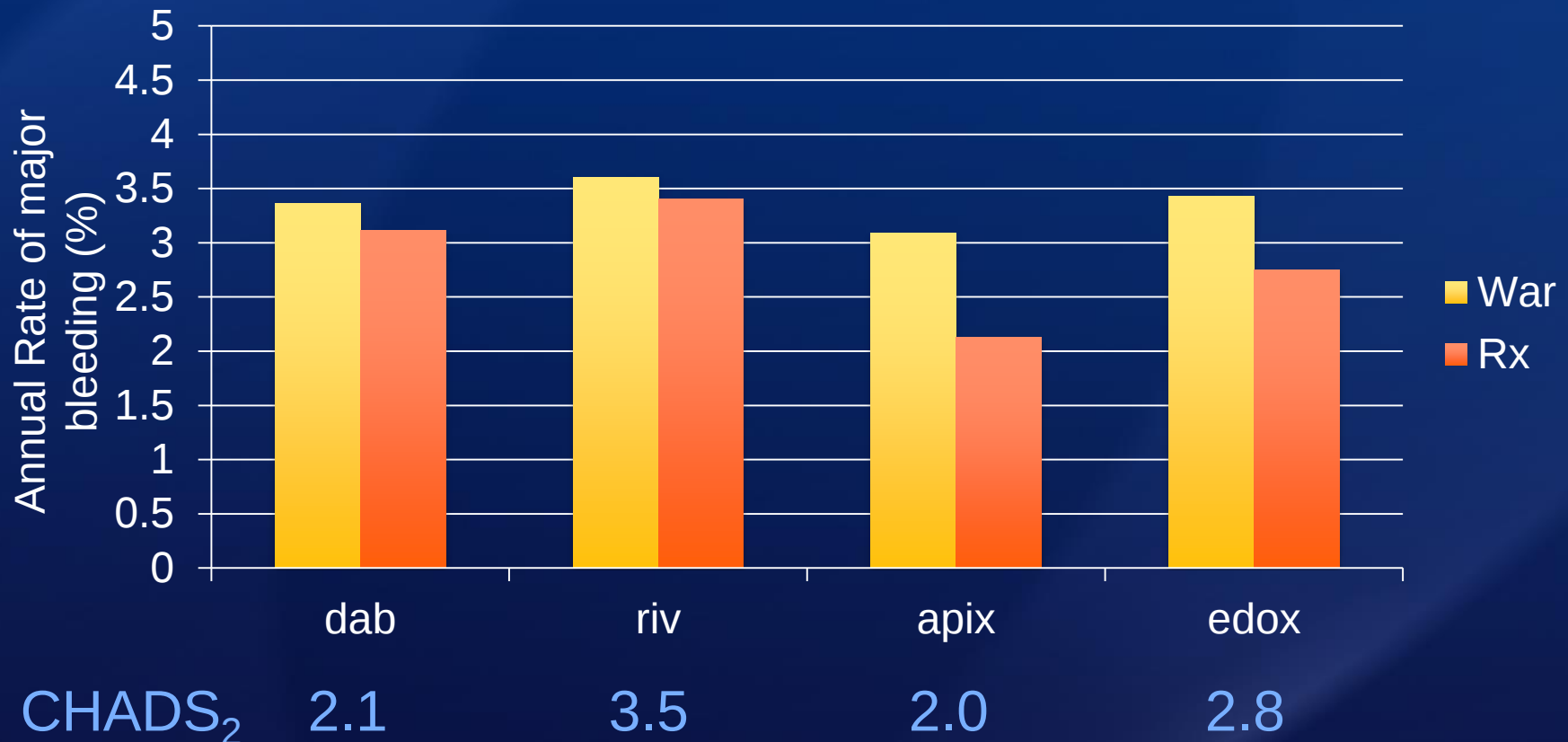


Summary of the NOAC Trials: *Annual Risk of Stroke and Systemic Embolism*



Connolly et al NEJM 2009, Patel et al 2011, Granger et al NEJM 2011, Giugliano NEJM 2013

Summary of the NOAC Trials: *Annual Risk of Major bleeding*



Connolly et al NEJM 2009, Patel et al 2011, Granger et al NEJM 2011, Giugliano NEJM 2013

2019 ACC/AHA/HRS AF guidelines

Stroke Risk

COR	LOE	Recommendation
I	A,B	For patients with AF and an elevated CHA2DS2-VASc score of 2 or greater in men or 3 or greater in women, oral anticoagulants are recommended
I	A	NOACs (dabigatran, rivaroxaban, apixaban, and edoxaban) are recommended over warfarin in NOAC-eligible patients with AF (except with moderate-to-severe mitral stenosis or a mechanical heart valve)
IIb	C-LD	For patients with AF (except with moderate-to-severe mitral stenosis or a mechanical heart valve) and a CHA2DS2-VASc score of 1 in men and 2 in women, prescribing an oral anticoagulant to reduce thromboembolic stroke risk may be considered

2019 ACC/AHA AF guidelines

Stroke Risk-nonpharmacologic strategies

COR	LOE	Recommendation
IIb	B-NR	Percutaneous LAA occlusion may be considered in patients with AF at increased risk of stroke who have contraindications to long-term anticoagulation

2019 ACC/AHA AF guidelines

Stroke Risk-weight loss

COR	LOE	Recommendation
I	B-R	For overweight and obese patients with AF, weight loss, combined with risk factor modification, is recommended

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

- Hypertension
- Endocarditis
- Pericardial disease
- Vascular disease
- Ischemic Heart Disease
- Stroke
- Dysrhythmias
- Congenital heart disease
- Valvular heart disease
- Heart Failure
- Miscellaneous

Stroke risk reduction

- *CHA₂DS₂-VaSC (without sex)*
- *NOAC rather than VKA*

Conservative measures

- *Weight loss, exercise, sleep apnea*

Symptom management

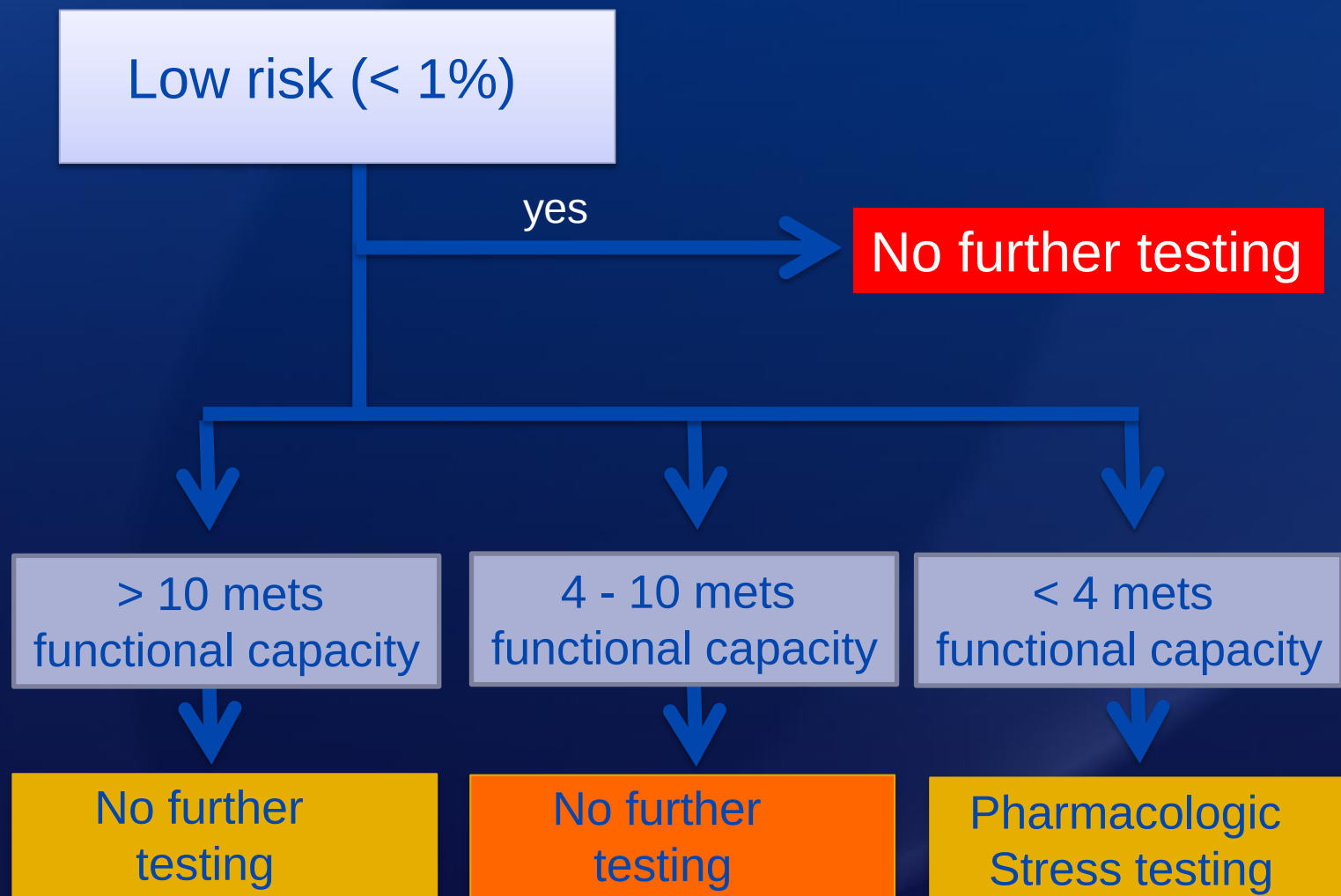
- *Rate vs. rhythm control*

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

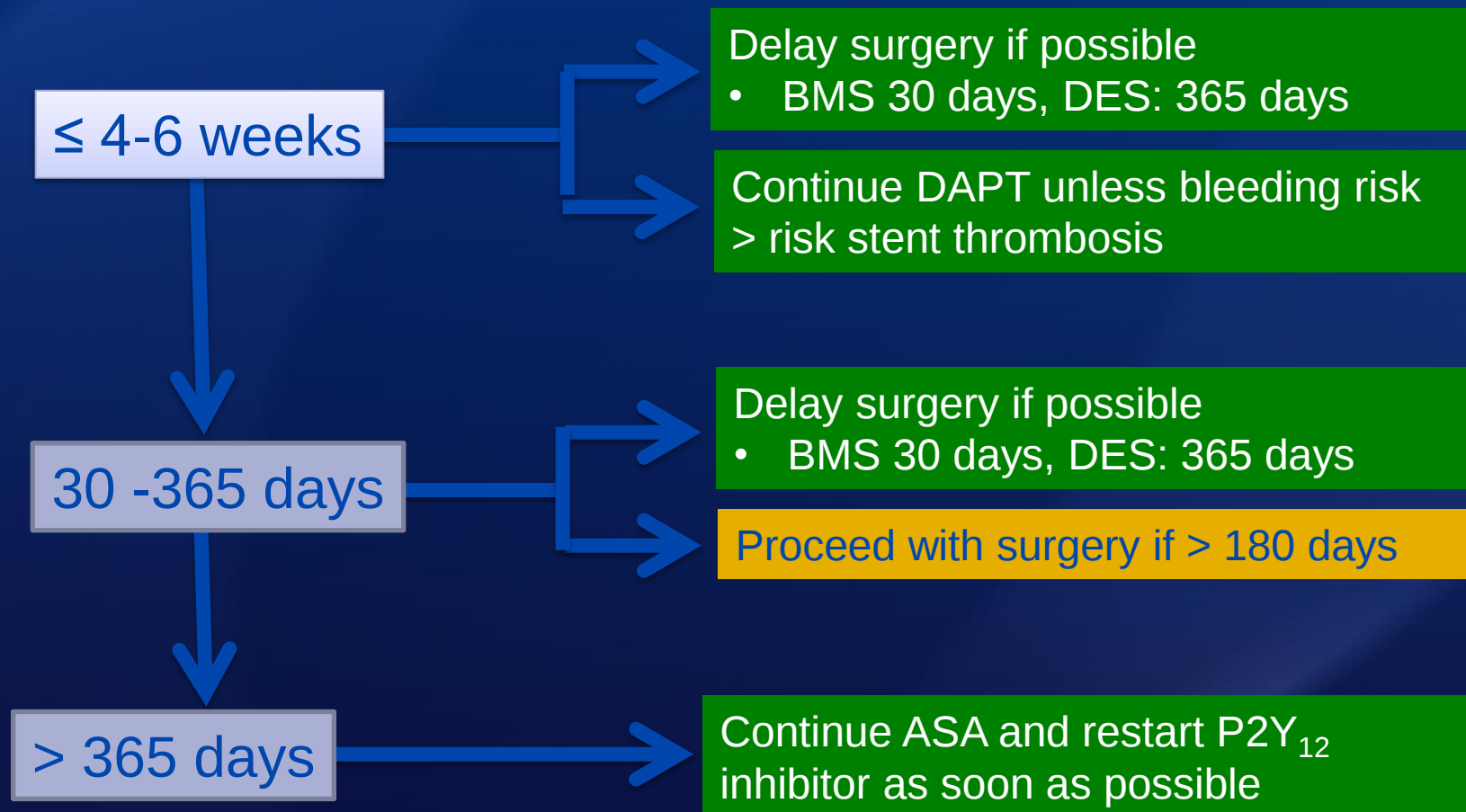
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2014 ACC/AHA Perioperative Guideline

Perioperative Risk



2014 ACC/AHA Perioperative Guideline Stent and perioperative DAPT



EXPERT CONSENSUS DECISION PATHWAY

2017 ACC Expert Consensus Decision Pathway for Periprocedural Management of Anticoagulation in Patients With Nonvalvular Atrial Fibrillation



A Report of the American College of Cardiology Clinical Expert Consensus Document Task Force

John U. Doherty, MD, FACC, *Chair*

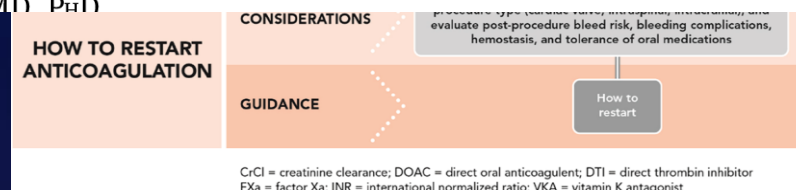
Ty J. Gluckman, MD, FACC

William I. Hucker, MD, PhD

Thomas L. Ortel, MD, PhD

Sherry J. Saxonhouse, MD, FACC

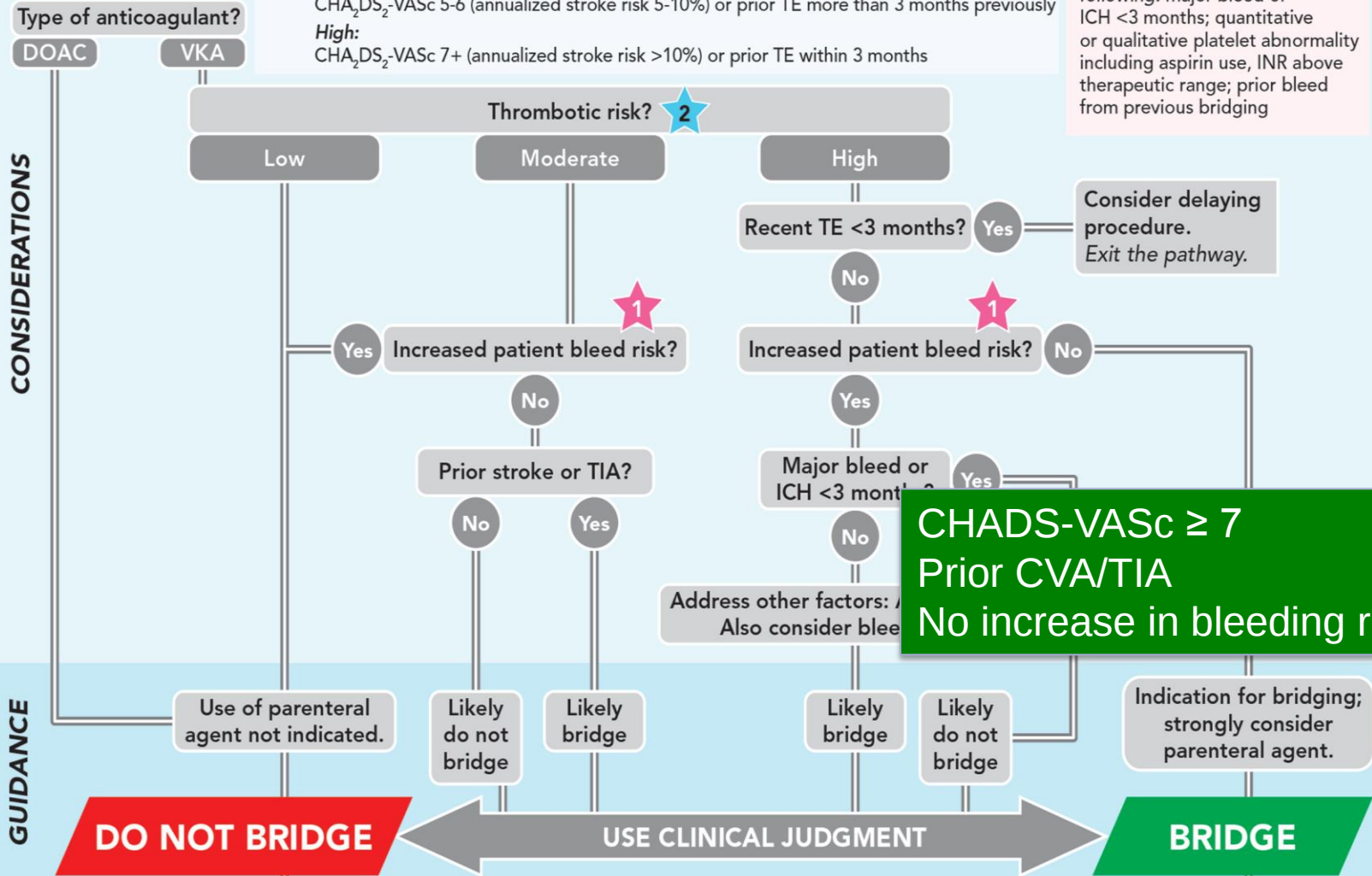
Sarah A. Spinler, PHARM D, AACC



WHETHER TO BRIDGE

2 Assess patient thrombotic risk definitions:
Low: CHA₂DS₂-VASc 1-4 (annualized stroke risk <5%), no prior TE
Moderate: CHA₂DS₂-VASc 5-6 (annualized stroke risk 5-10%) or prior TE more than 3 months previously
High: CHA₂DS₂-VASc 7+ (annualized stroke risk >10%) or prior TE within 3 months

1 Assess patient bleed risk checklist
 Bleed risk considered increased if any 1 of the following: major bleed or ICH <3 months; quantitative or qualitative platelet abnormality including aspirin use, INR above therapeutic range; prior bleed from previous bridging



Discontinuing NOAC prior to surgery (if necessary)

Drug	Recommendation
Dabigatran	CrCl $\geq$ 50 ml/min: 24-48° CrCl < 50 ml/min: 3-5 days
Rivaroxaban	> 24°
Apixaban	Moderate to high risk: 48° Low risk: 24°
Edoxaban	> 24°

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

- Hypertension
- Endocarditis
- Peripheral artery disease
 - Pharm stress for < 4 mets
 - Bridging almost never required
 - Uninterrupted DAPT if possible after DES
- Ischemic Heart Disease
 - Preoperative consultation
- Dysrhythmias
- Lipid disorders
- Congenital heart disease
- Antithrombotic Rx
- Valvular heart disease
- Miscellaneous
- Heart Failure

ABIM Internal Medicine Certification Examination Blueprint (Cardiology)

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