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In partnership with:

جمعية القلب السعودية
Saudi Heart Association

Stroke and AF Mechanisms and Temporal Relationships

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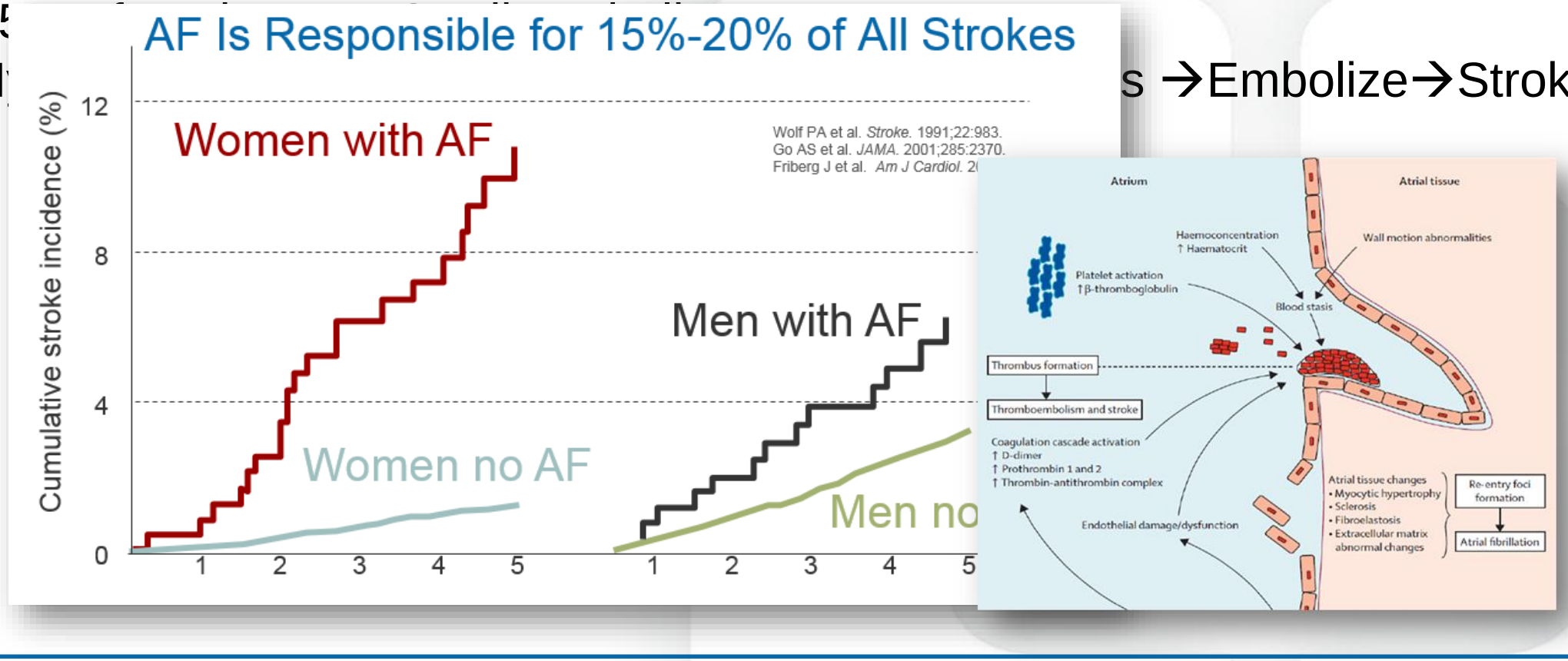
AF “Causes” Stroke

- Patients with AF: 3-5x increased risk of stroke
- 75
  H s →Embolize→Stroke



AF and Stroke: Does the Amount of AF Matter?

Amount ?
Duration ?
Pattern ?
Overall Burden ?
Other factors ?

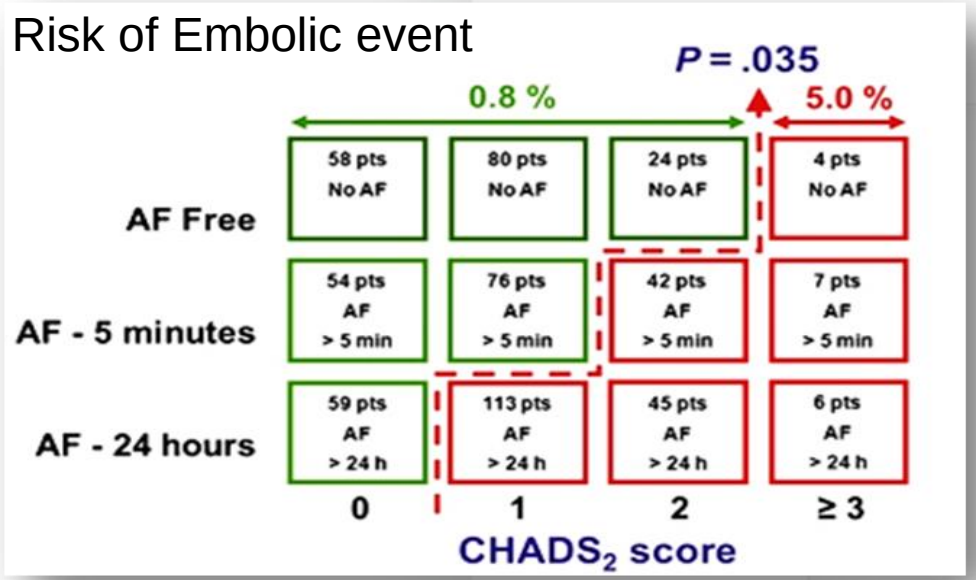
Trials Using Continuous Arrhythmia Monitoring to Correlate AT/AF and Stroke Risk

Study Name	Monitoring Device	Prior AT/AF?	AT/AF Burden Threshold	Endpoint Event	Hazard Ratio (C.I.)
MOST Sub-study22	100% Pace-maker	Allowed, but not required	>5 minutes	Death or non-fatal stroke	2.79 [1.51,5.15]
Italian AT500 Registry23	100% Pace-maker	History of symptomatic AT	>24 hours	Ischemic stroke, TIA, or pe-ripheral arterial embolism	3.1 [1.1, 10.5]
TRENDS24	TRENDS24 50% Pace-maker 31% ICD 19% CRT	Allowed, but not required	≥5.5 hours	Ischemic stroke, TIA, or systemic embolism	2.20 [0.96, 5.05]
Biotronik25	100% CRT	Allowed, but not required	≥3.8 hours	Ischemic stroke, TIA, or pe-ripheral arterial embolism	9.4 [1.8, 47.0]
ASSERT27	95% Pace-maker 5% ICD	Excluded	≥6 minutes	Ischemic stroke or systemic embolism	2.49 [1.28, 4.85]

There is a clear association between the burden of AF and stroke

AF and Stroke: Does the Amount of AF Matter?

- Botto: *JCE 2009; 20:241-248 (n=568)*
  - Stroke risk is a function of both AF burden and $CHADS_2$ score. **Low burden/high $CHADS_2$** and high burden/low $CHADS_2$ both have high risk.



AF Causes Stroke: Issues

- Duration of AF episode vs. stroke
  - A single brief episode of subclinical AF in patients with LA dilatation is associated with a 2 fold higher risk of stroke

- Rhythm control does not appear to reduce the risk of stroke

- Tempor
  - Despit
    AF unt

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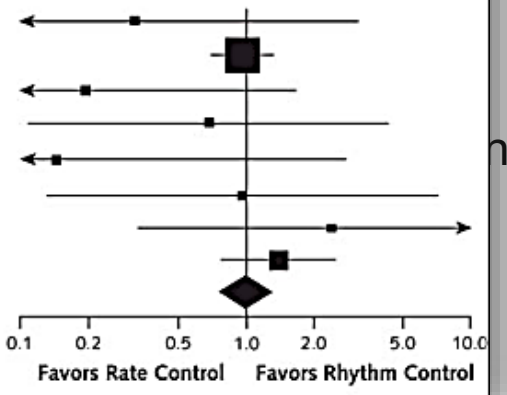
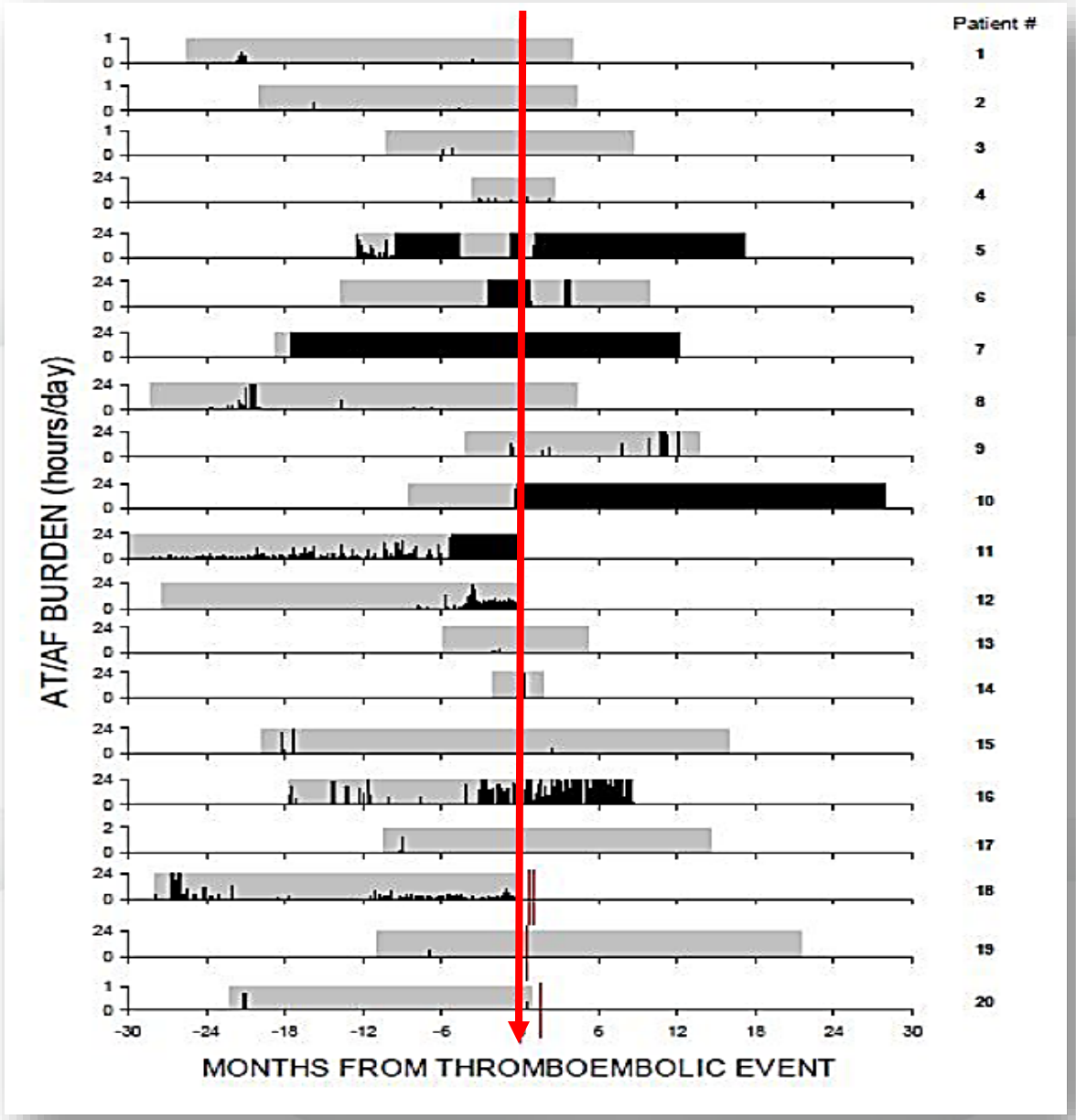
C.

		Stroke	
		Rate Control	Rhythm Control
Brignole et al, 2002 (17)	0.319 (0.032–3.142)	1/69	3/68
Wyse et al, 2002 (27)	0.964 (0.701–1.326)	77/2027	80/2033
Carlsson et al, 2003 (18)	0.192 (0.022–1.673)	1/100	5/100
Okçün et al, 2004 (20)	0.685 (0.110–4.276)	3/84	2/39
Opolski et al, 2004 (21)	0.143 (0.007–2.801)	0/101	3/104
Petrac et al, 2005 (22)	0.960 (0.130–7.091)	2/52	2/50
Yildiz et al, 2008 (28)	2.391 (0.330–17.342)	2/66	2/155
Talajic et al, 2010 (24)	1.392 (0.776–2.495)	28/694	20/682
Overall	0.994 (0.759–1.302)		



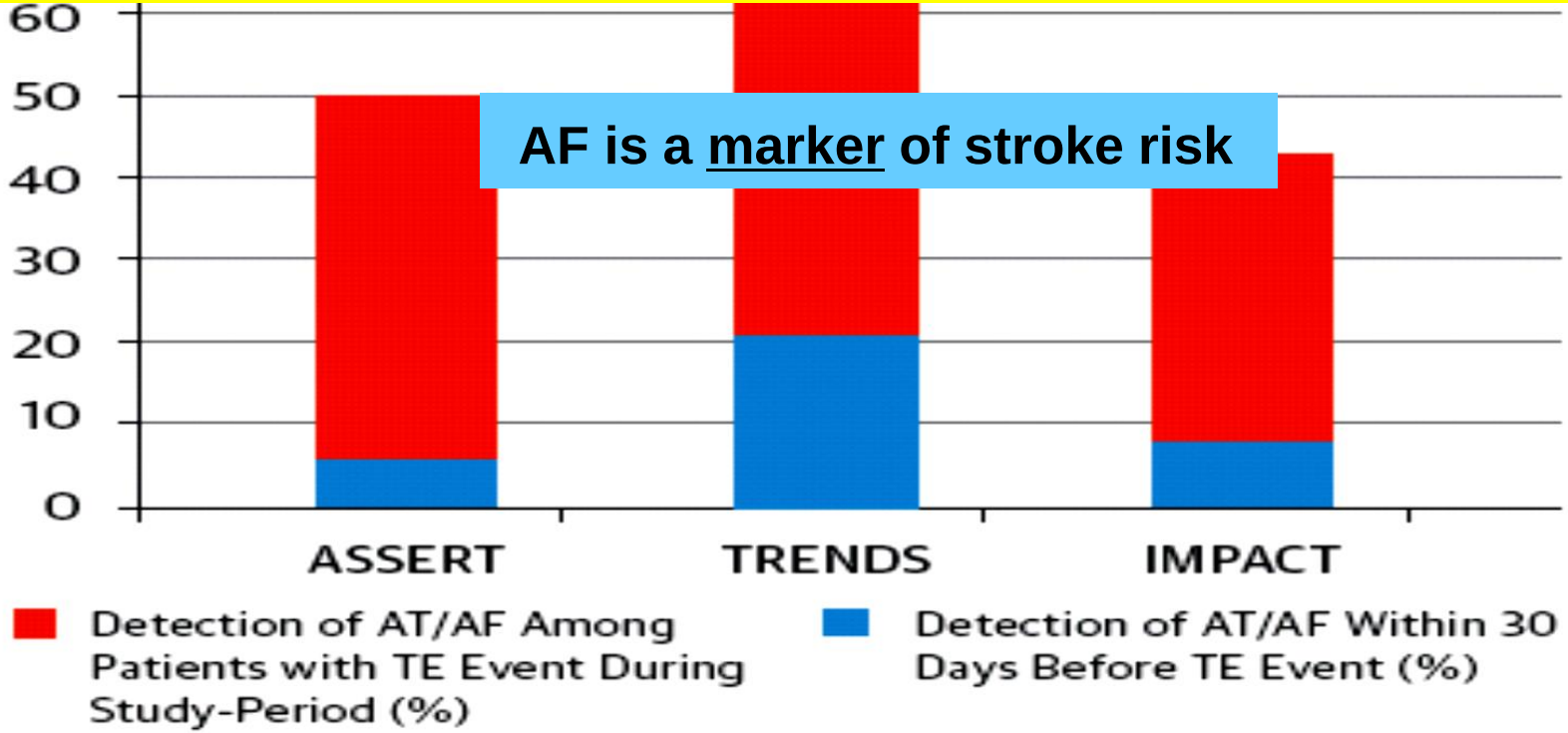
Al Khatib et al. Ann Intern Med. 2014;160(11):760-773.

Temporal Disconnect between subclinical AF and Embolic Events



AF and Stroke: Temporal Disconnect

Correlation between the burden of AF and stroke
BUT
Poor temporal relation between timing of AF and occurrence of stroke



AF is a marker of stroke risk

Risk is ongoing irrespective of AF occurrence: Related to CV "badness".

AF : Contribution of Associated Factors to Stroke

- Shared Risk Factors
- Associated LA abnormalities

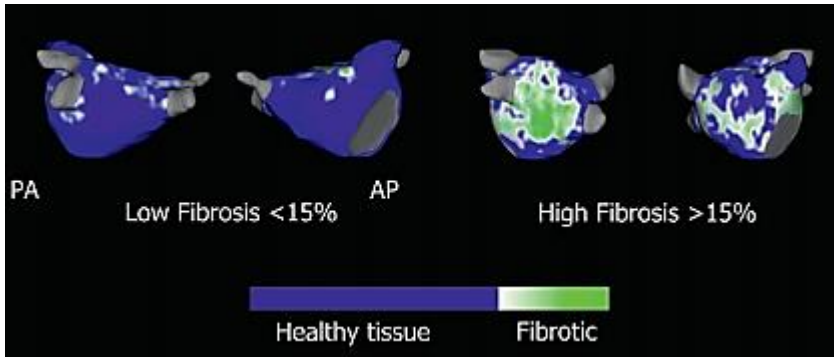
  Fibrosis
  Protein deposits
  Endothelial dysfunction
  Chamber dilatation
  Mechanical dysfunction (LAA)

- “Atrial disease ⟷ Thrombogenicity”

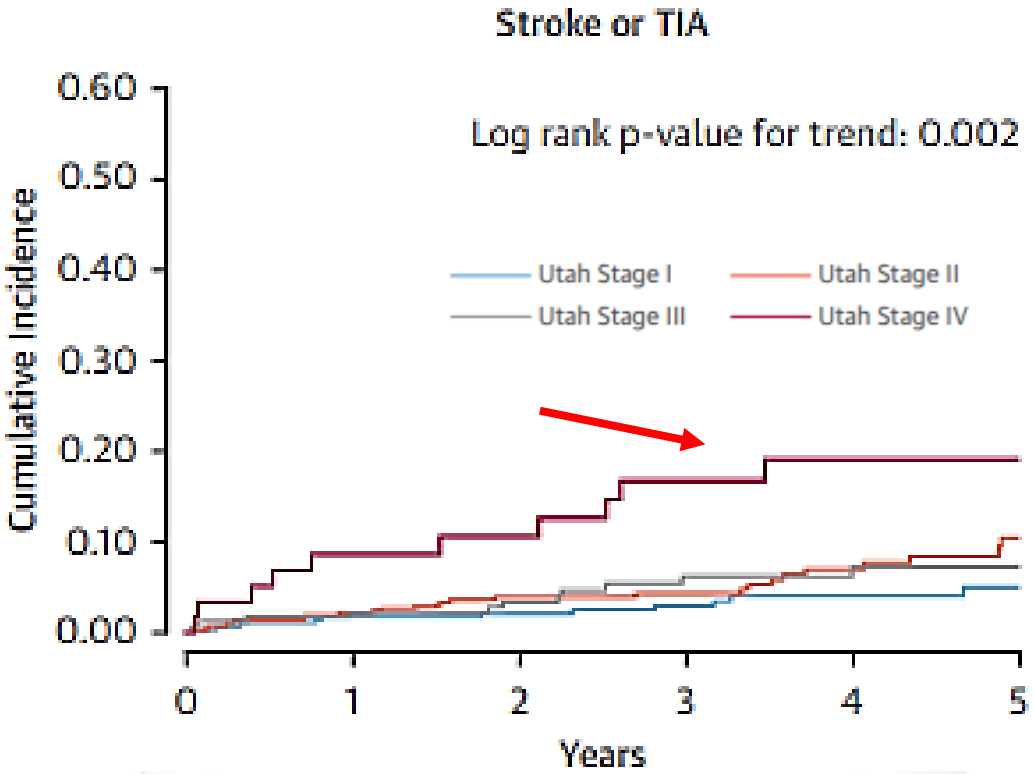
Left Atrial Fibrosis and Risk of Cerebrovascular and Cardiovascular Events in Patients With Atrial Fibrillation

Time for a New Risk stratification?

N=1228



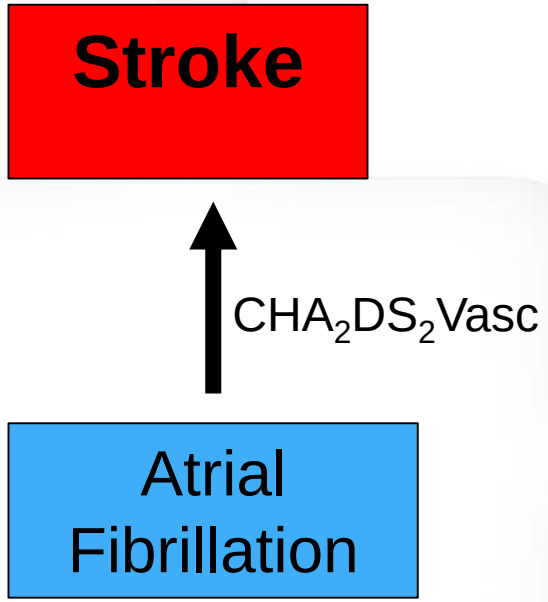
CHA2DS2-VASc	Stage 1	Stage 2	Stage 3	Stage 4
0/1	48%	37%	33%	20%
2	18%	21%	22%	27%
≥3	34%	42%	45%	53%



Severe LA LGE (fibrosis) is associated with increased MACCE risk, driven primarily by increased risk of stroke or TIA

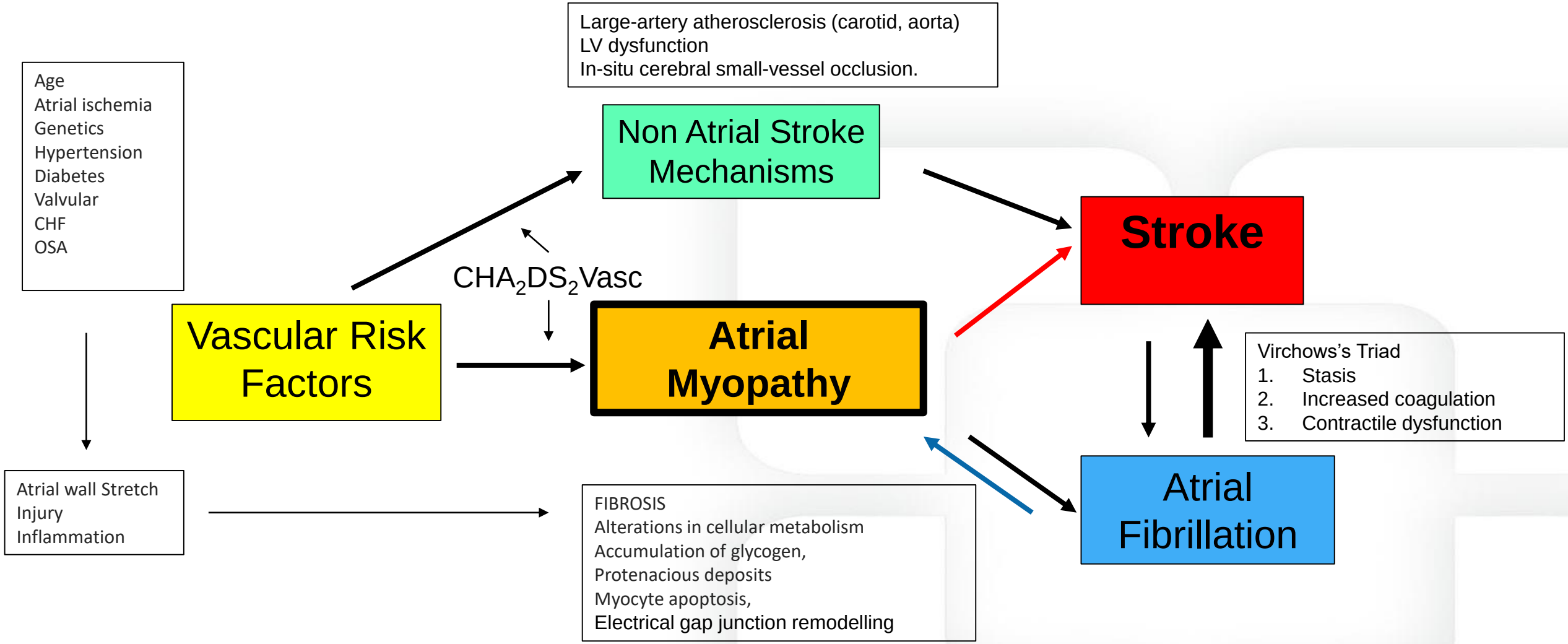
King et al. J Am Coll Cardiol 2017;70:1311–21

Conventional Model for Stroke in Atrial Fibrillation



Kamel et al. Stroke. 2016 March ; 47(3): 895–900

New Model for Stroke in Atrial Fibrillation



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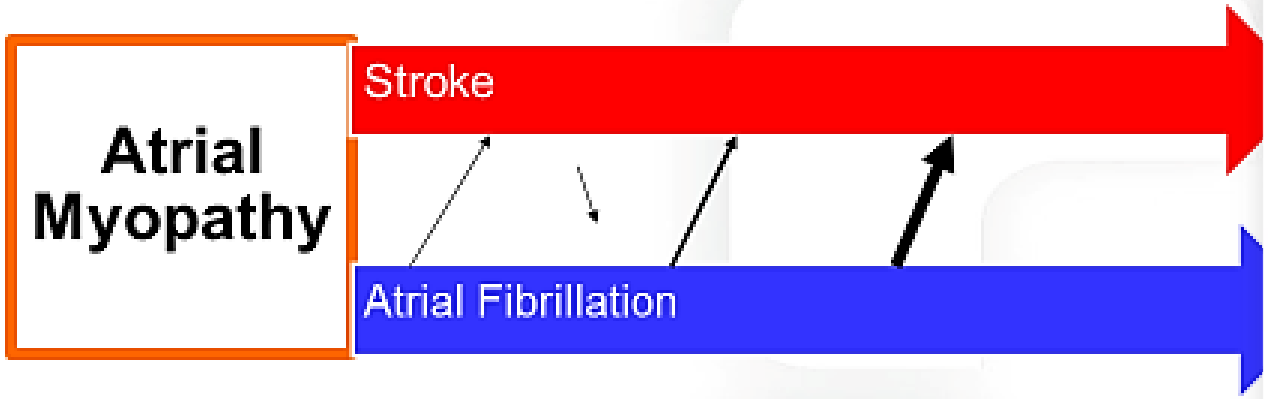
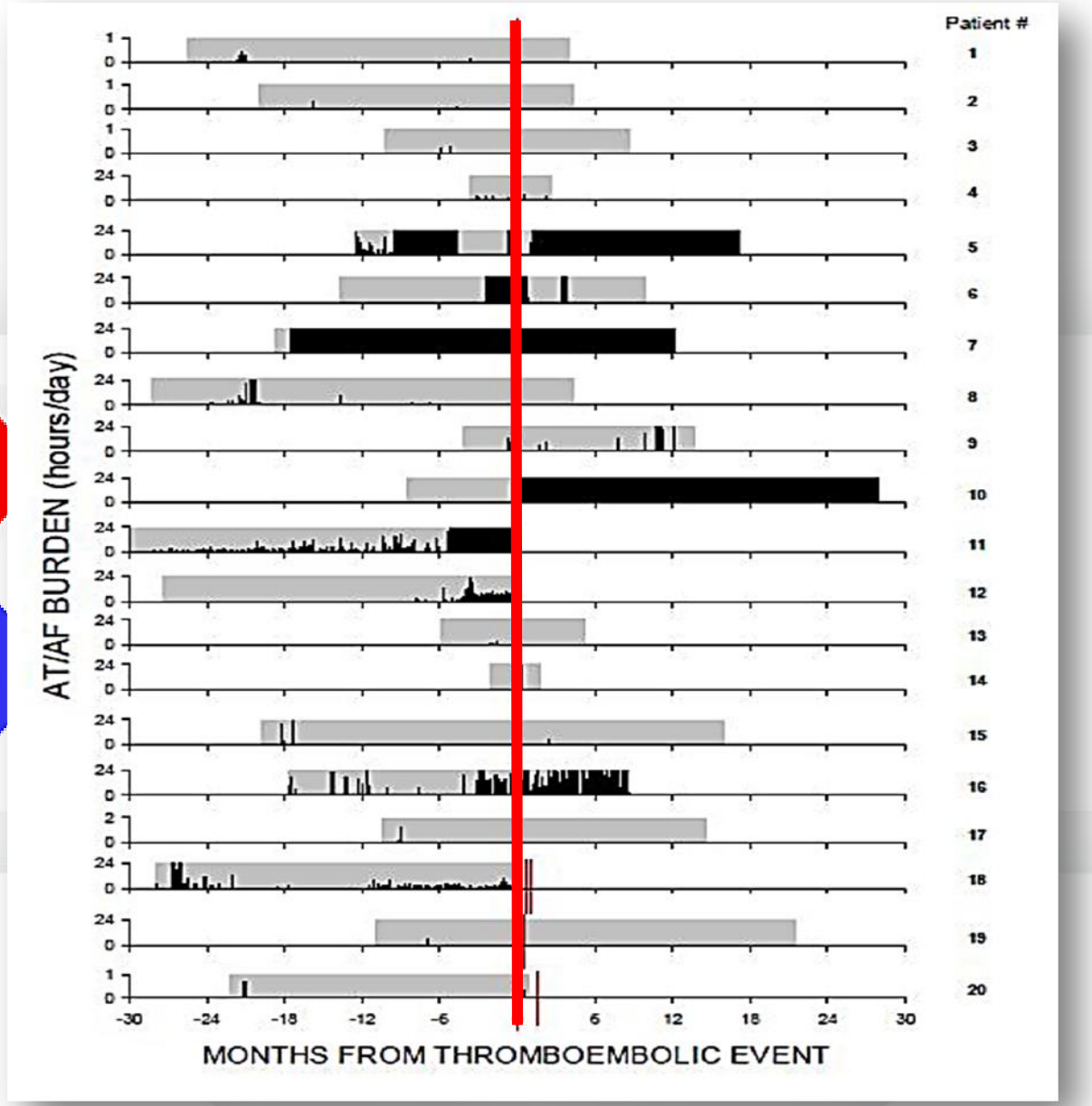
Understanding the Model



2 phenotypes of the same disease



Implications for Therapy

- Cryptogenic stroke…No need for AF
- New risk stratification…Lone Afib?
- Implication for anticoagulation: Change in Perception
- Better screening: Atrial substrate (EKG) rather than AF monitoring (AI)
- Targeted therapy to reverse atrial myopathy (…?effect on stroke risk)

→Therapy: Anticoagulation + RF modifications

How about patients without AF…Can we prevent the first stroke?

Case 1

- 71 year old female
- July 2016: (2 years ago) Single episode Afib for 1 hour.
- CHA2DS2-VASc=2 (borderline hypertension)
- BMI 26
- She was told by her MD: Lifelong anticoagulation.
- What do you think?

We do not have guidelines for every patient we see in our practice

Case 2

- 66 year old male patient
- Documented episodes of PAF 4 years ago, mildly symptomatic
- No OAC back then: CHA2DS2-VASc=0
- Treated with Flecainide with no “clinical recurrence”
- Now presenting for follow up.
- He has evidence of HTN started on Lisinopril 6 months ago by LMD
- Denies palpitations.
- Discussion re: OAC→ What would you recommend?

Case 2

- 80 year old female
- HTN, DM and CHF (LVEF 40%)
- Holter: NSR, PAC's, short runs of PAT (20 beats) asymptomatic
- Very concerned about stroke.
- Options:
  - Do nothing: No anticoagulation
  - Anticoagulate
  - Low dose anticoagulation
  - ILR to screen for AF

EARLY AF detection, Faster NOAC therapy→ Fewer strokes??

- EMBRACE
- CRYSTAL-AF
- FIND-AF


Thank You