Atrial Fibrillation Occurring During Acute Hospitalization: Updates for the Hospitalist

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Please place questions in Q&A Section at bottom of Zoom window!

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Joseph R. Sweigart, MD, SFHM
SHM Education Committee
Moderator

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Icahn School of Medicine at Mount Sinai

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Ebrahim Barkoudah, MD, MPH, FACP, SFHM
System Chief of Hospital Medicine
Regional Chief Medical Officer
Baystate Health

COI: Dr. Barkoudah reports research support payments from National Institutes of Health/National Heart, Lung, and Blood Institute, Bristol Myers Squibb and Janssen, payments made to Brigham and Women's Hospital for performing clinical endpoints sponsored by various entities, payments from WebMD and Advisory Board fees from Medscape, Janssen, Novartis, Pfizer, and travel expenses from Alexion. Editor in Chief, Journal of Clinical Outcomes Management

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Attestation Disclosure to the Audience

The activity director(s), planning committee member(s), speaker(s), author(s) or anyone in a position to control the content for the Atrial Fibrillation Occurring During Acute Hospitalization

NO financial interest or relationship which could be perceived as a real or apparent conflict of interest. There were no individuals in a position to control the content that refused to disclose.

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Question 1:

With regard to the identification of atrial fibrillation during hospitalization, what is currently considered the most effective method for detecting this condition?

A. Routine ECG for spot monitoring
B. Use of telemetry throughout the patient's stay
C. Patient-reported symptoms followed by targeted testing
D. All of the above

E. None of the above

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Question 2:

Concerning the management of atrial fibrillation in hospitalized patients, which of the following approaches is recommended as an effective strategy?

A. Immediate cardioversion, irrespective of the duration of atrial fibrillation
B. Rate control with beta-blockers or non-dihydropyridine calcium channel blockers for all patients
C. Long-term anticoagulation therapy without consideration of individual stroke risk
D. Rhythm control strategy, irrespective of the patient's symptomatic status
E. None of the above

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Circulation
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https://doi.org/10.1161/CIR.0000000000001133

AHA SCIENTIFIC STATEMENT

Atrial Fibrillation Occurring During Acute Hospitalization: A Scientific Statement From the American Heart Association

Janice Y. Chyou, MD, FAHA, Chair, Ebrahim Barkoudah, MD, MPH, Jonathan W. Dukes, MD, Larry B. Goldstein, MD, FAHA, Jose A. Joglar, MD, FAHA, Anson M. Lee, MD, Steven A. Lubitz, MD, MPH, FAHA, Keith A. Marill, MD, MS, Kevin B. Sneed, PharmD, Megan M. Streur, PhD, ARNP, Graham C. Wong, MD, MPH, FAHA, Rakesh Gopinathannair, MD, MA, FAHA, Vice Chair, and on behalf of the American Heart Association Acute Cardiac Care and General Cardiology Committee, Electrocardiography and Arrhythmias Committee, and Clinical Pharmacology Committee of the Council on Clinical Cardiology; Council on Cardiovascular Surgery and Anesthesia; Council on Cardiopulmonary, Critical Care, Perioperative and Resuscitation; Council on Cardiovascular and Stroke Nursing; and Stroke Council

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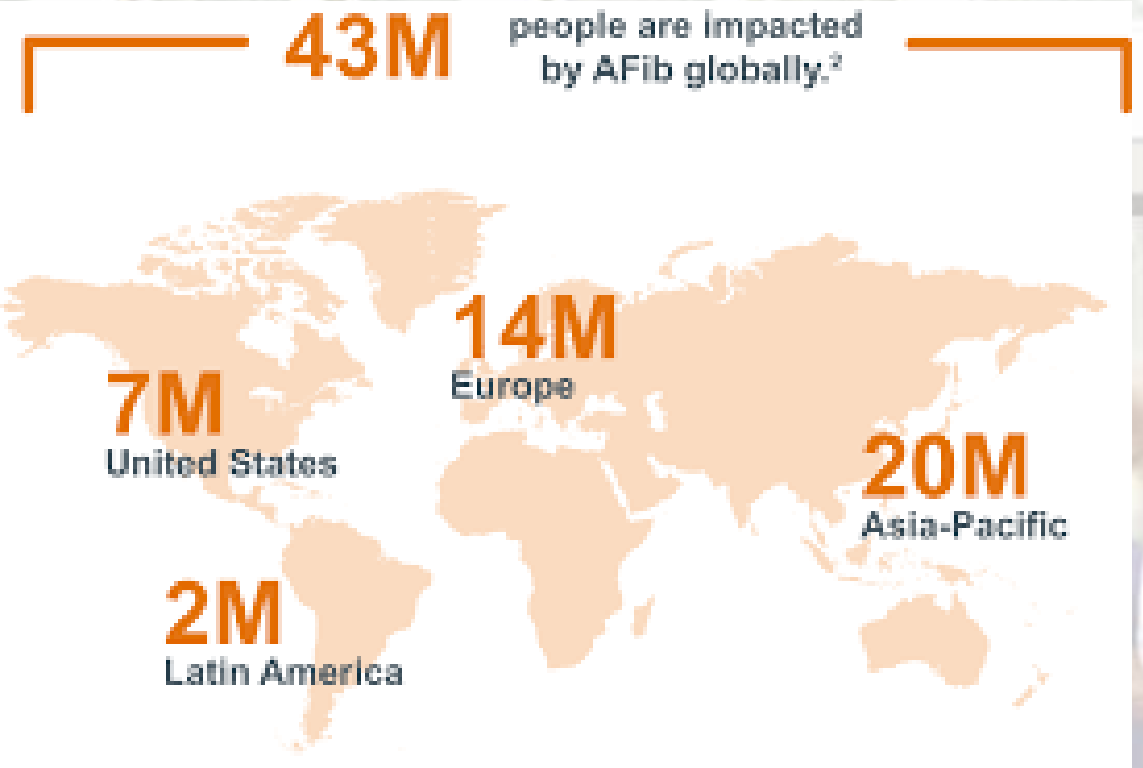

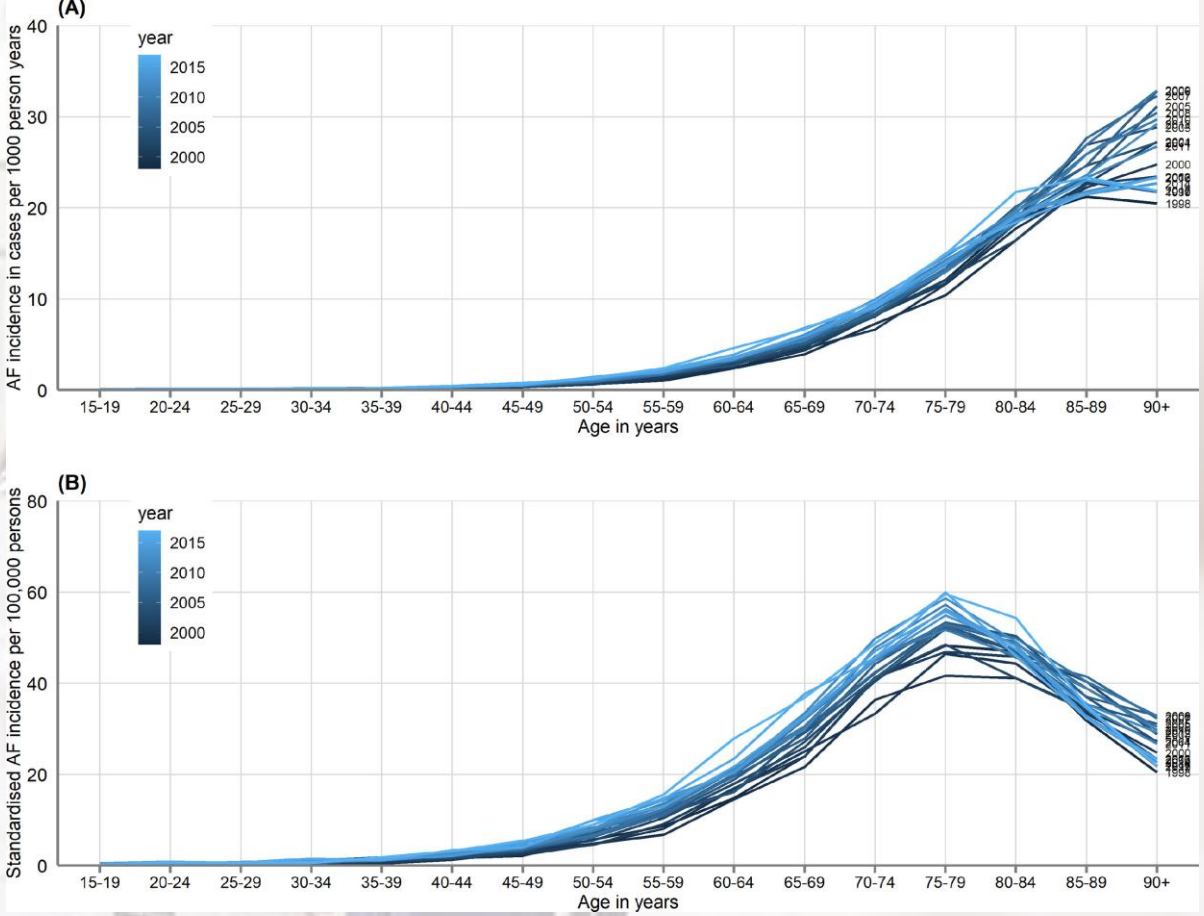

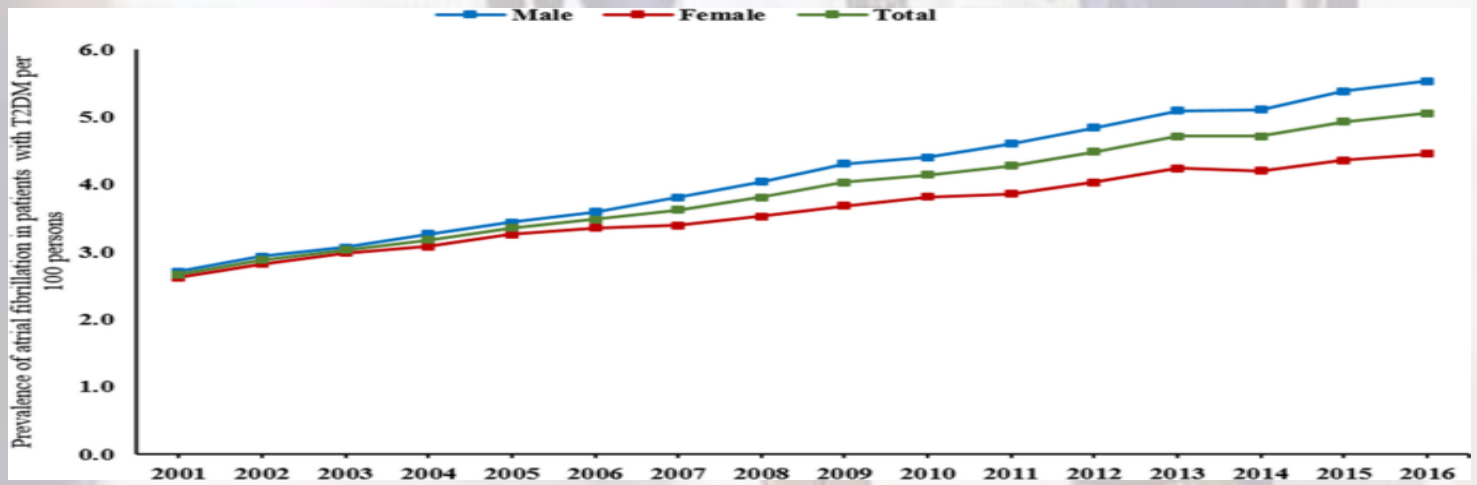

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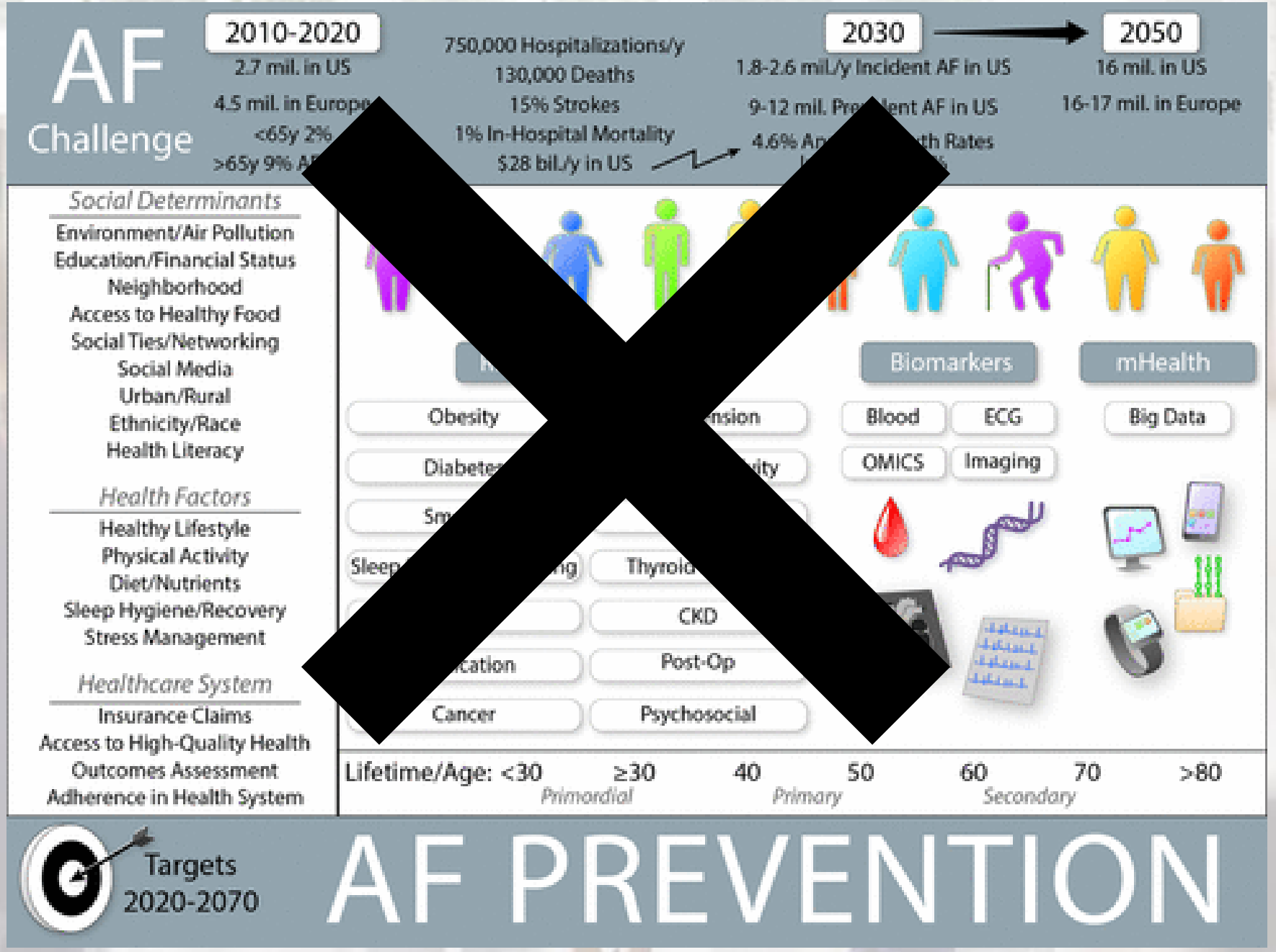

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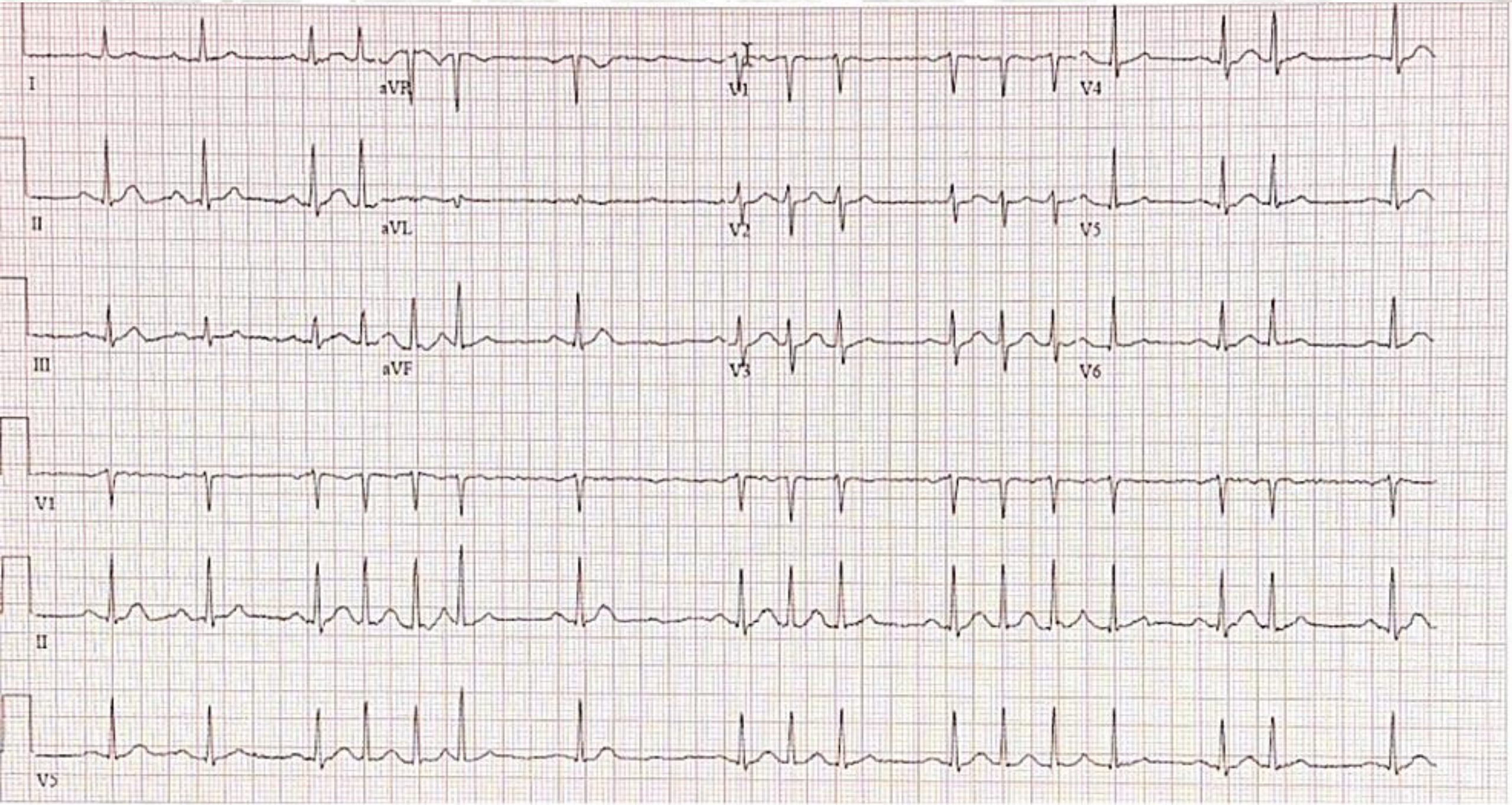
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5

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New-onset atrial fibrillation following hospitalization for pneumonia associated with increased thromboembolic risk

ATRIAL FIBRILLATION (AF): IS NEW-ONSET ATRIAL FIBRILLATION FOLLOWING HOSPITALIZATION OF PNEUMONIA ASSOCIATED WITH INCREASED THROMBOEMBOLIC RISK?

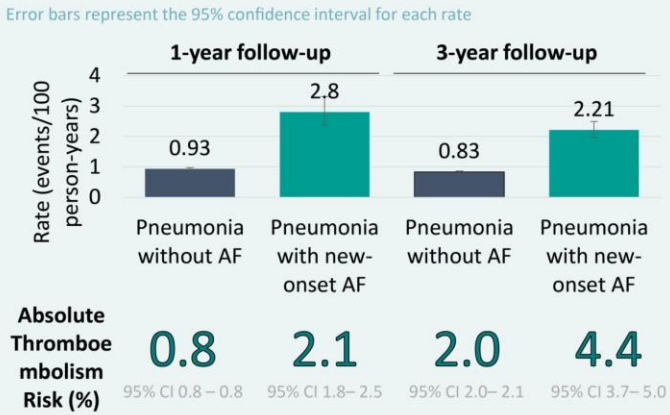
PROSPECTIVE COHORT STUDY

274,196 adult patients who were hospitalized with community-acquired pneumonia over 10-year period*

STATISTICAL ANALYSIS of thromboembolic events, recurrent atrial fibrillation, and death

PRIMARY OUTCOME

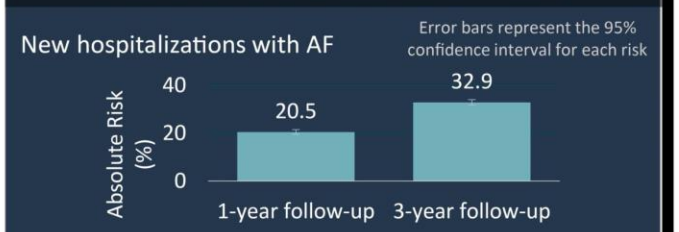
Proportion of arterial thromboembolic events (ischemic stroke or systemic arterial embolism) that led to hospital admission

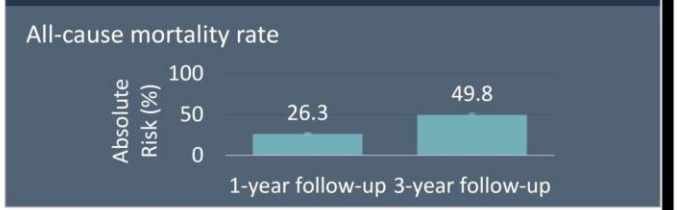


Absolute Thromboembolism Risk (%)	Pneumonia without AF	Pneumonia with new-onset AF	Pneumonia without AF	Pneumonia with new-onset AF
	0.8	2.1	2.0	4.4
	95% CI 0.8 – 0.8	95% CI 1.8– 2.5	95% CI 2.0– 2.1	95% CI 3.7– 5.0

SECONDARY OUTCOMES

In patients with new-onset AF following hospitalization of pneumonia not on anticoagulation therapy





New-onset atrial fibrillation following hospitalization for community acquired pneumonia was associated with higher subsequent thromboembolic risk

*Of 2714,196 adult patients, 6553 patients (52.0%) had new-onset AF

Sogaard *et al*. *JAMA Network Open* .May 26, 2022.

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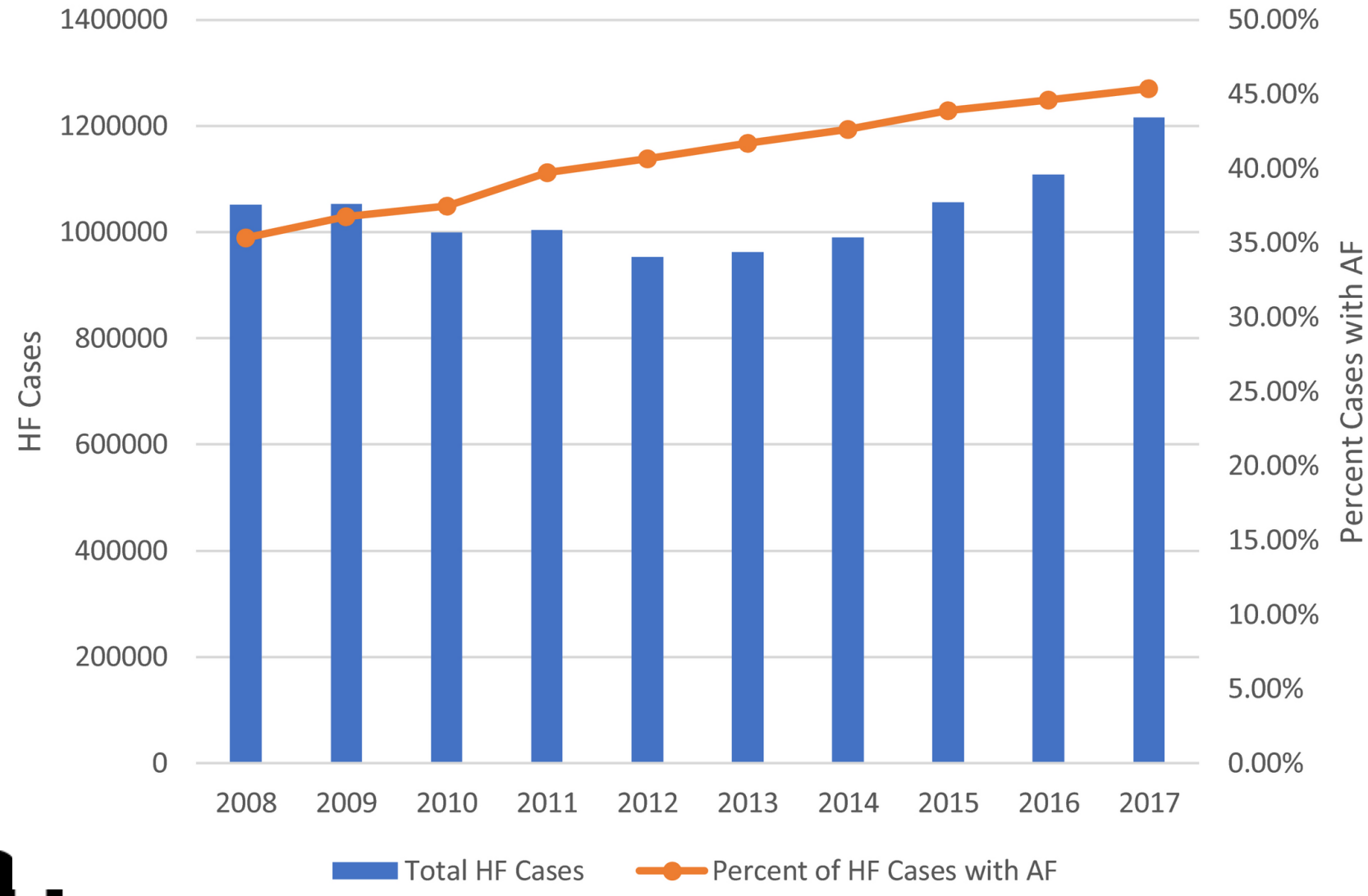
National Trends in the Burden of Atrial Fibrillation During Hospital Admissions for Heart Failure



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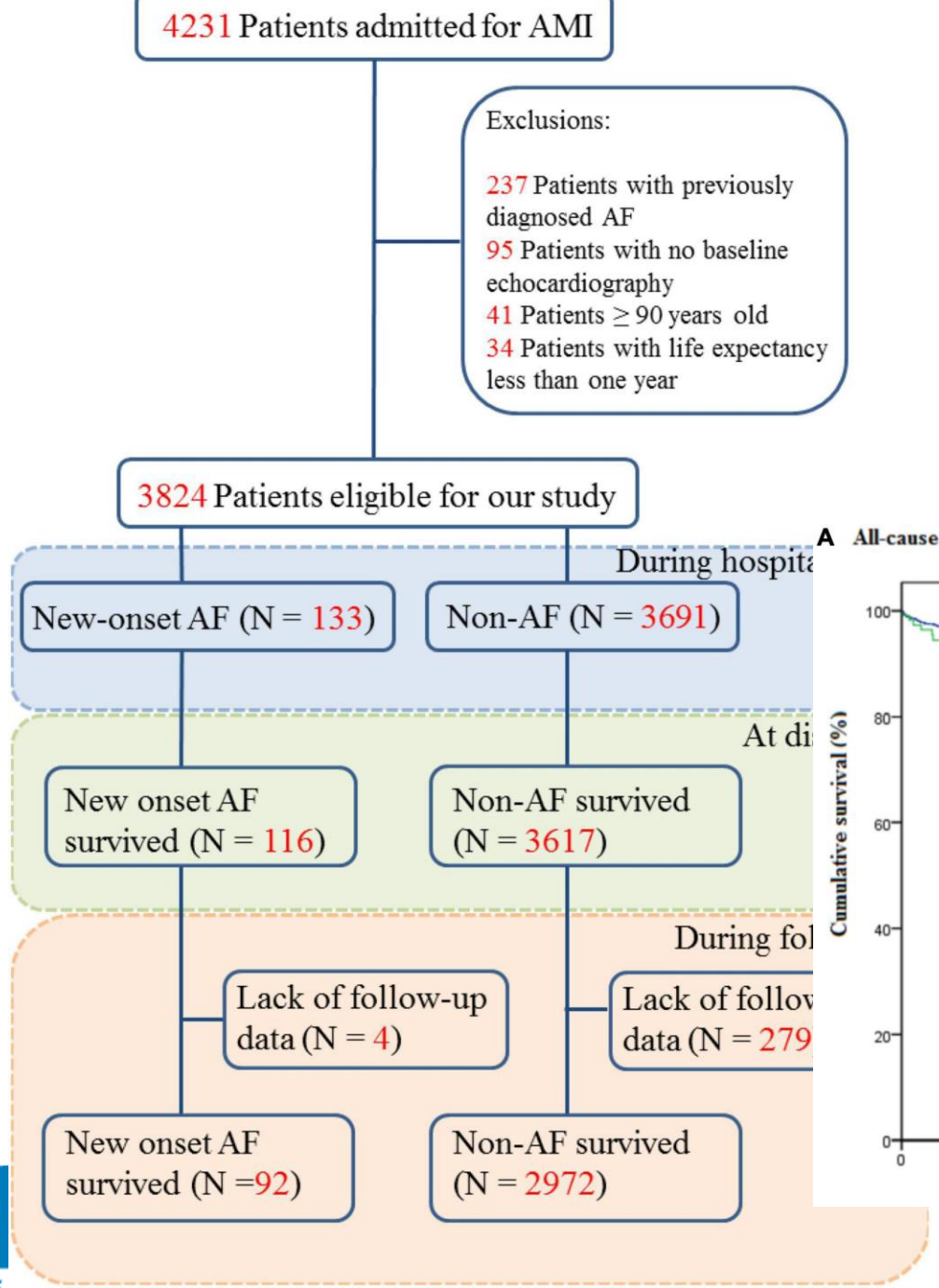
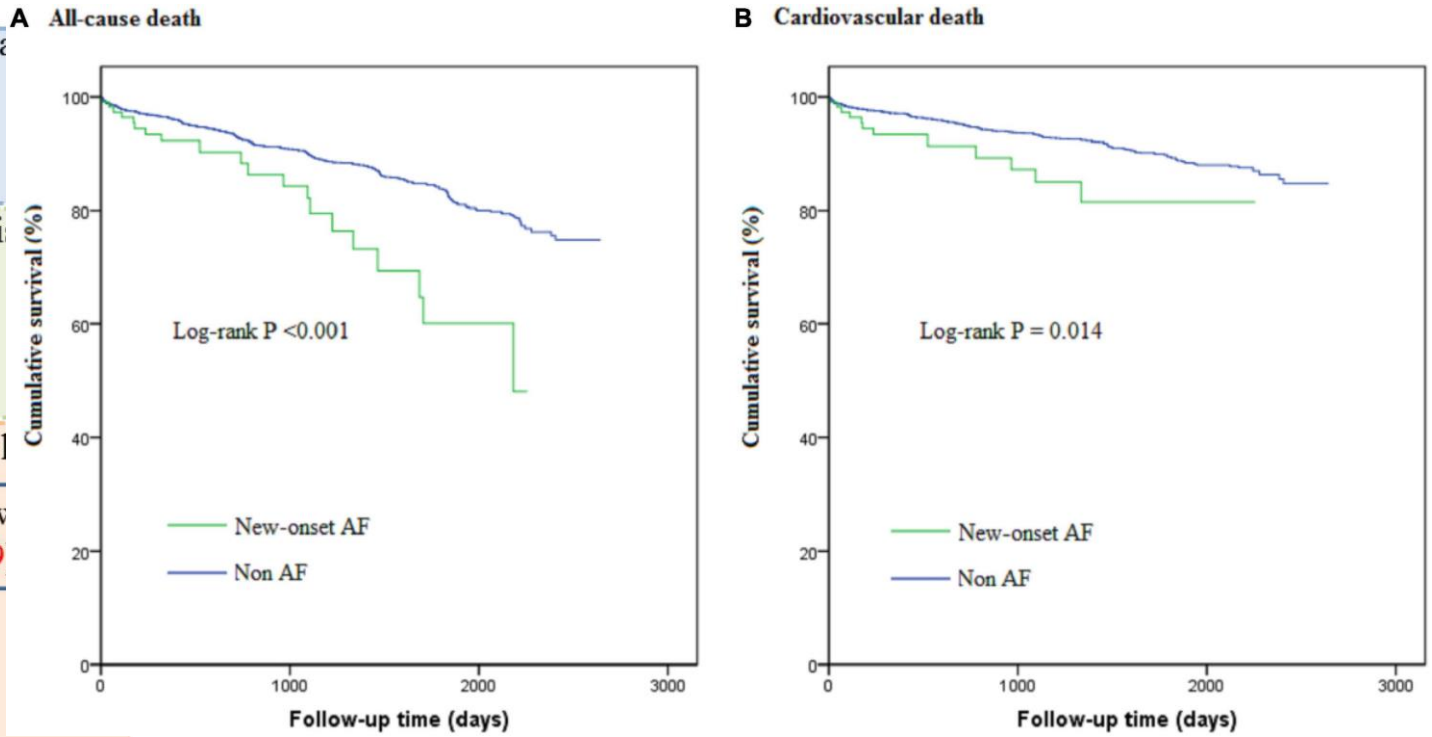
Journal of the American Heart Association. 2021;10:e019412

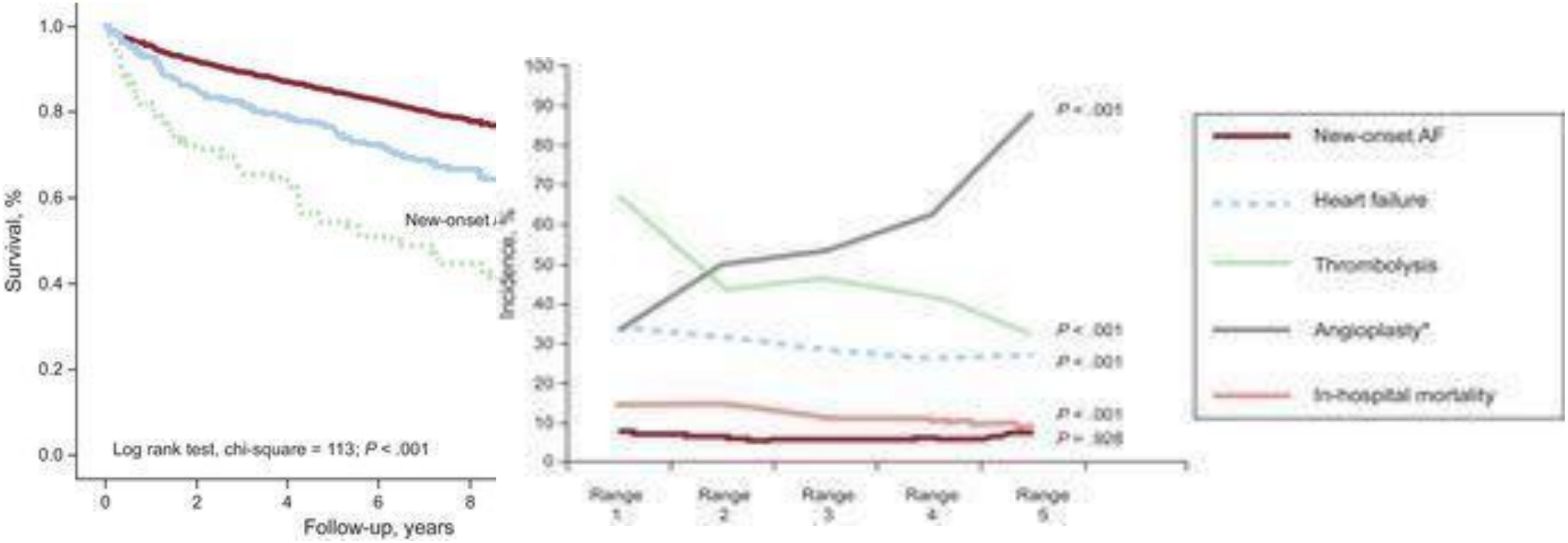
Implications of new-onset atrial fibrillation on in-hospital and long-term prognosis of patients with acute myocardial infarction





Front. Cardiovasc. Med., 28 October 2022
Sec. Cardiac Rhythmology
Volume 9 - 2022 | https://doi.org/10.3389/fcvm.2022.979546

Short- and Long-term Prognosis of Previous and New-onset Atrial Fibrillation in ST-segment Elevation Acute Myocardial Infarction



DOI: 10.1016/j.rec.2014.03.017

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PHENOTYPES

- HFrEF
- HFpEF
- HFmrEF

HEART FAILU

- Thromboembolism
- Cerebral hypoperfu
- Endothelial dysfunction

CEREBRAL COMPLICATIONS

- Hyperlipidemia
- Diabetes mellitus
- Older age
- Alcohol
- Smoking

Patients with Afib have:

5X increase in stroke risk

5X increase in heart failure (HF) development

GIC SUBTYPES

bolic
amic

MIC STROKE

tonomic dysfunction
sfuntion
ysfunction
cardiomyopathy

- Arrhythmia
- Acute myocardial infarction

CARDIAC COMPLICATIONS

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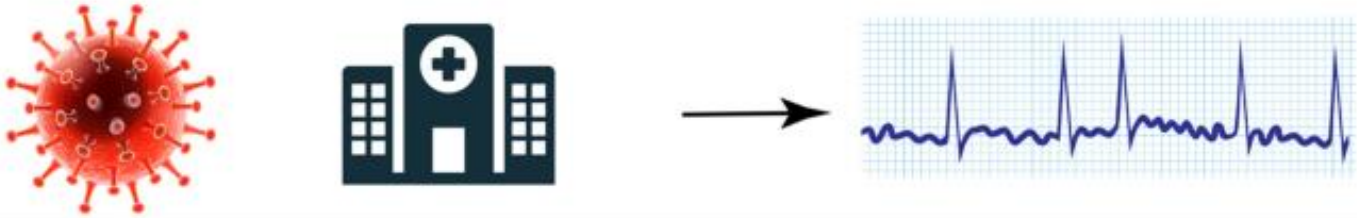
COVID-19 increases the risk for the onset of atrial fibrillation in hospitalized patients

Atrial fibrillation in hospitalized COVID-19 patients

Research Question:



Is **COVID-19** in **hospitalized patients** associated with **atrial fibrillation** ?

Methods and Results:

- Retrospective **database review** of adult patients
- **Matching** on common risk factors for AF and **multivariable logistic regression**
- Identification of **116,529 patients** (78,725 eligible for analysis)
- Comparison of **COVID+**, **COVID-** and **pre-pandemic** patients

COVID+ vs. COVID-	**COVID+ vs. pre-pandemic**
OR 1.19	**OR 1.57**
(95% CI: 1.00, 1.41)	(95% CI: 1.23, 2.00)

for development of AF

COVID-19 is associated with an increased risk of AF in hospitalized patients.

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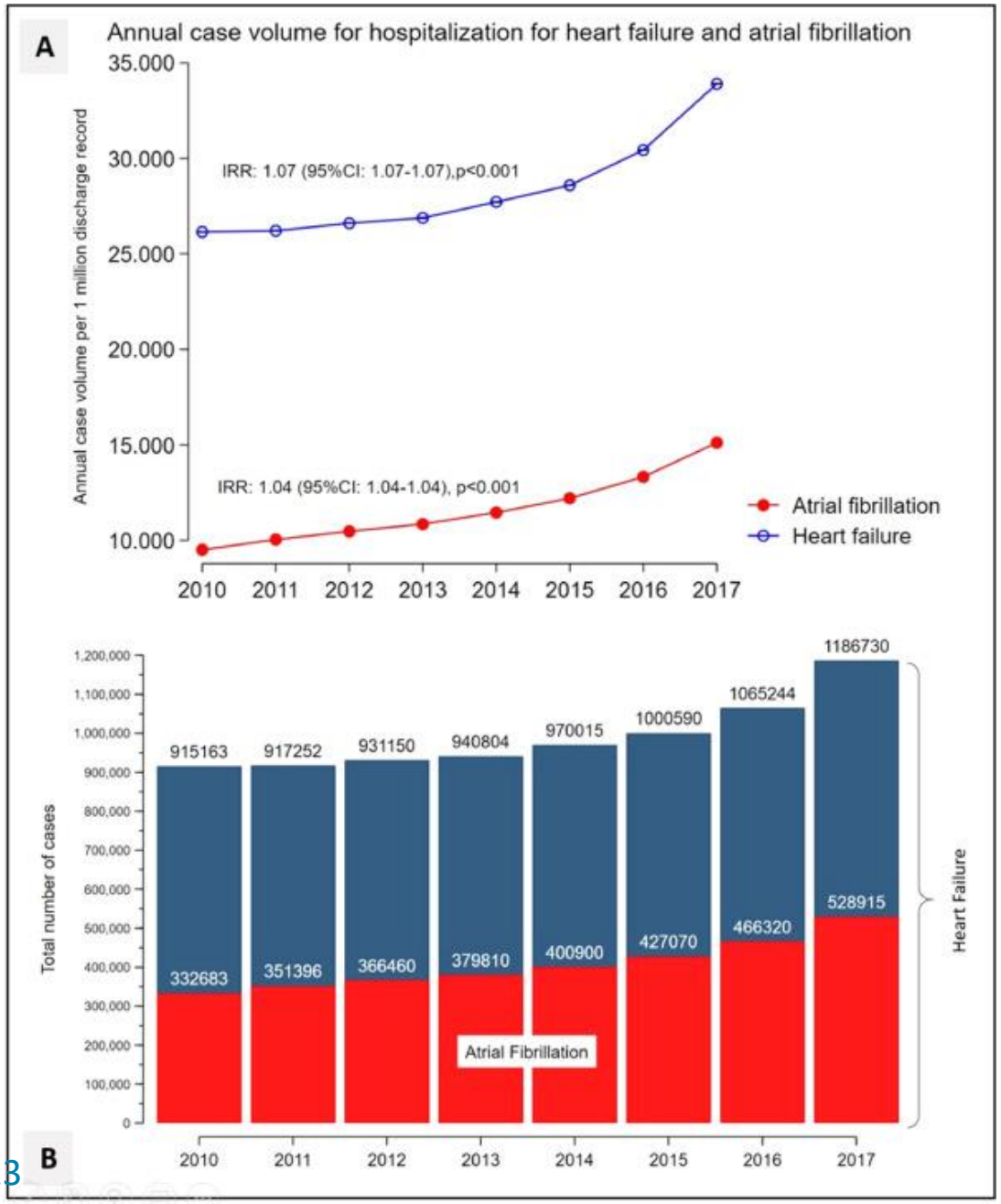
Economic Impact of Atrial Fibrillation on Hospitalization Outcomes of Acute Heart Failure in the United States

- the prevalence of atrial fibrillation among patients with heart failure is significantly elevated
- 4% annual increase in the prevalence of AF among patients hospitalized with HF



https://doi.org/10.1016/j.amjcard.2020.10.028

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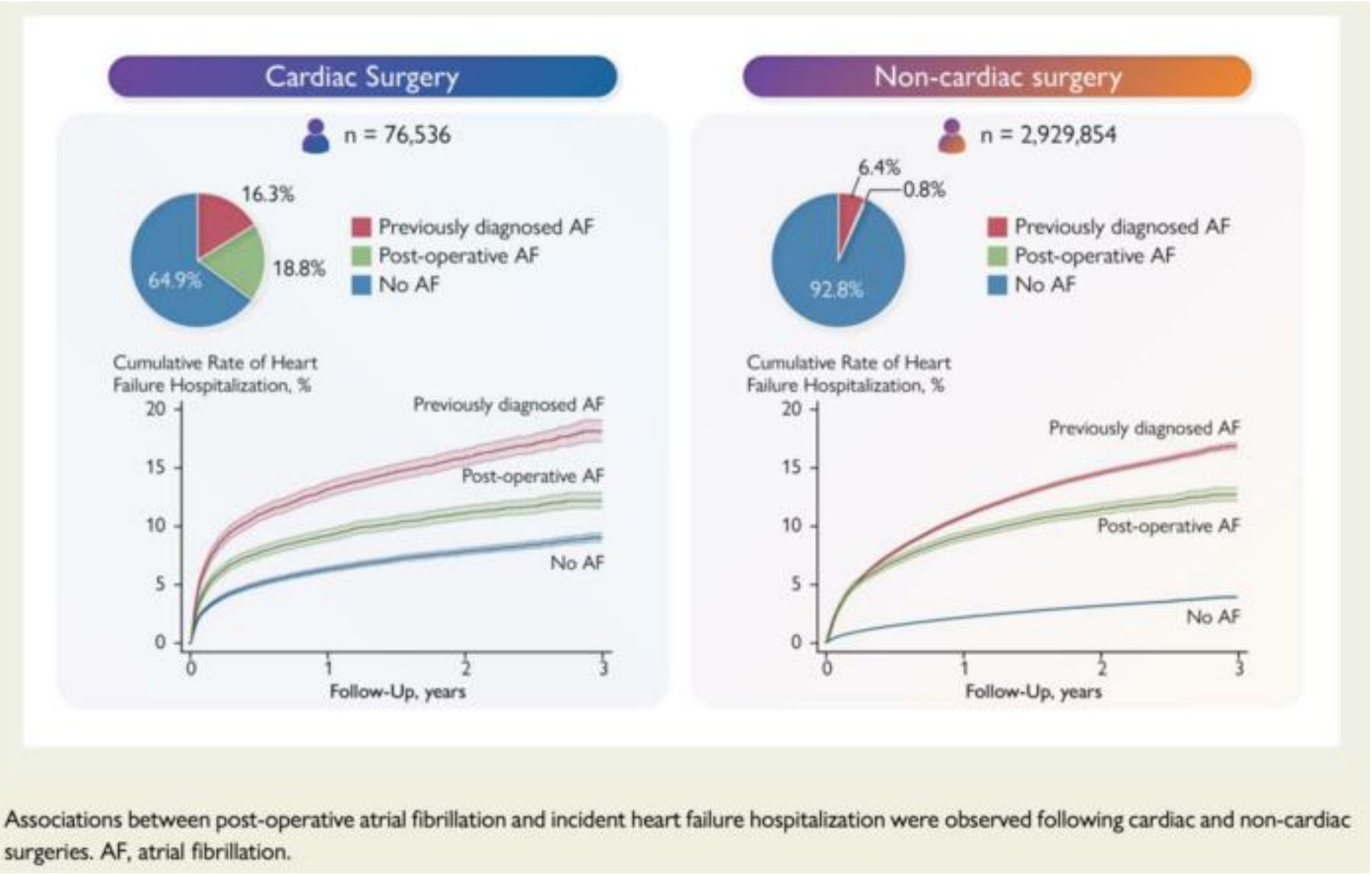

Associations between post-operative atrial fibrillation and incident heart failure hospitalization were observed following cardiac and non-cardiac surgeries. AF, atrial fibrillation.

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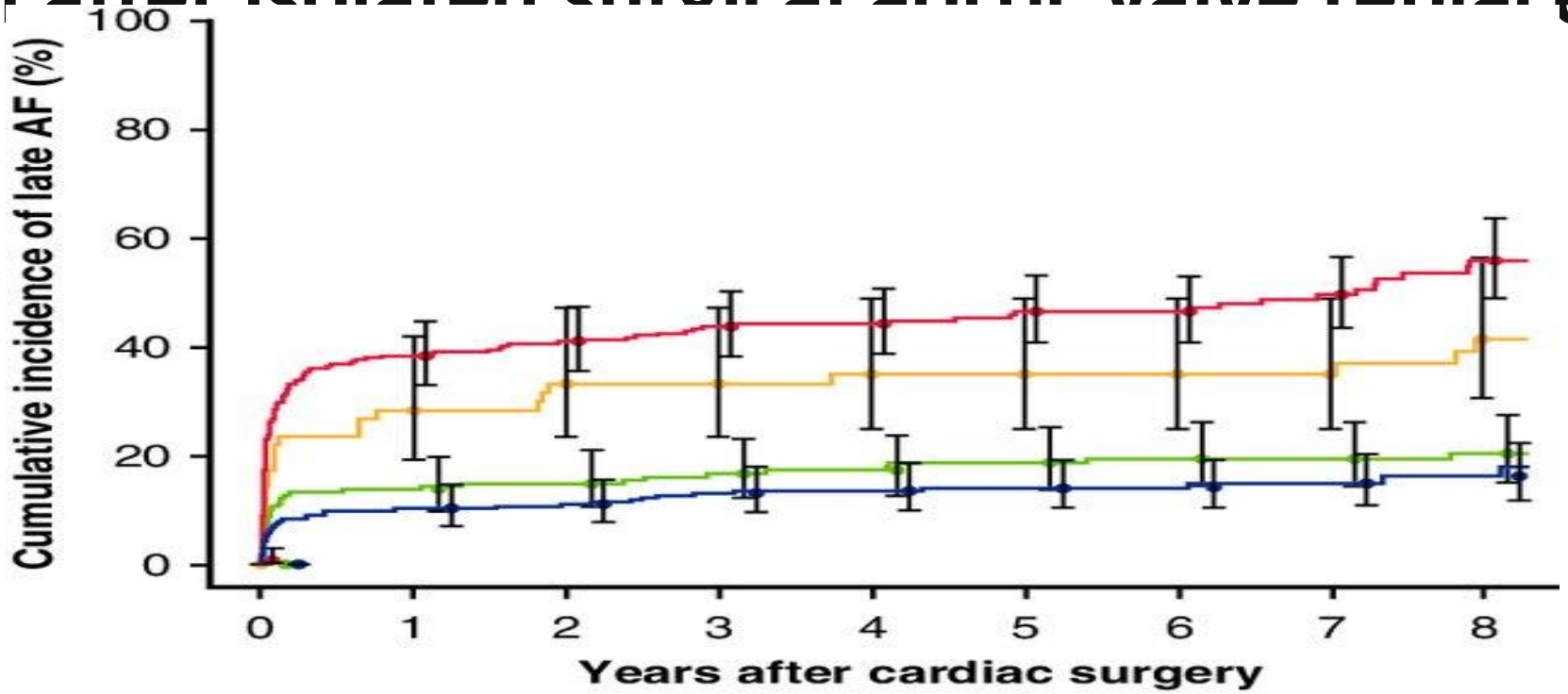
1] "Post-operative atrial fibrillation and risk of heart failure hospitalization", by Parag Goyal et al. *European Heart Journal*. doi:10.1093/eurheartj/ehac285
[2] "Post-operative AF and heart failure hospitalizations: what remains hidden in patients undergoing surgery", by Melissa E. Middeldorp and Christine M. Albert. *European Heart Journal*. doi:10.1093/eurheartj/ehac335

Late incidence and recurrence of new-onset atrial fibrillation after isolated surgical aortic valve replacement



Patients at risk

MEC: NOAF during index hospitalization +	64	43	38	36	34	33	29	25	20
BIO: NOAF during index hospitalization +	271	155	140	114	88	65	53	37	20
MEC: NOAF during index hospitalization –	189	153	142	130	119	104	88	78	69
BIO: NOAF during index hospitalization –	255	218	210	181	154	126	85	55	34

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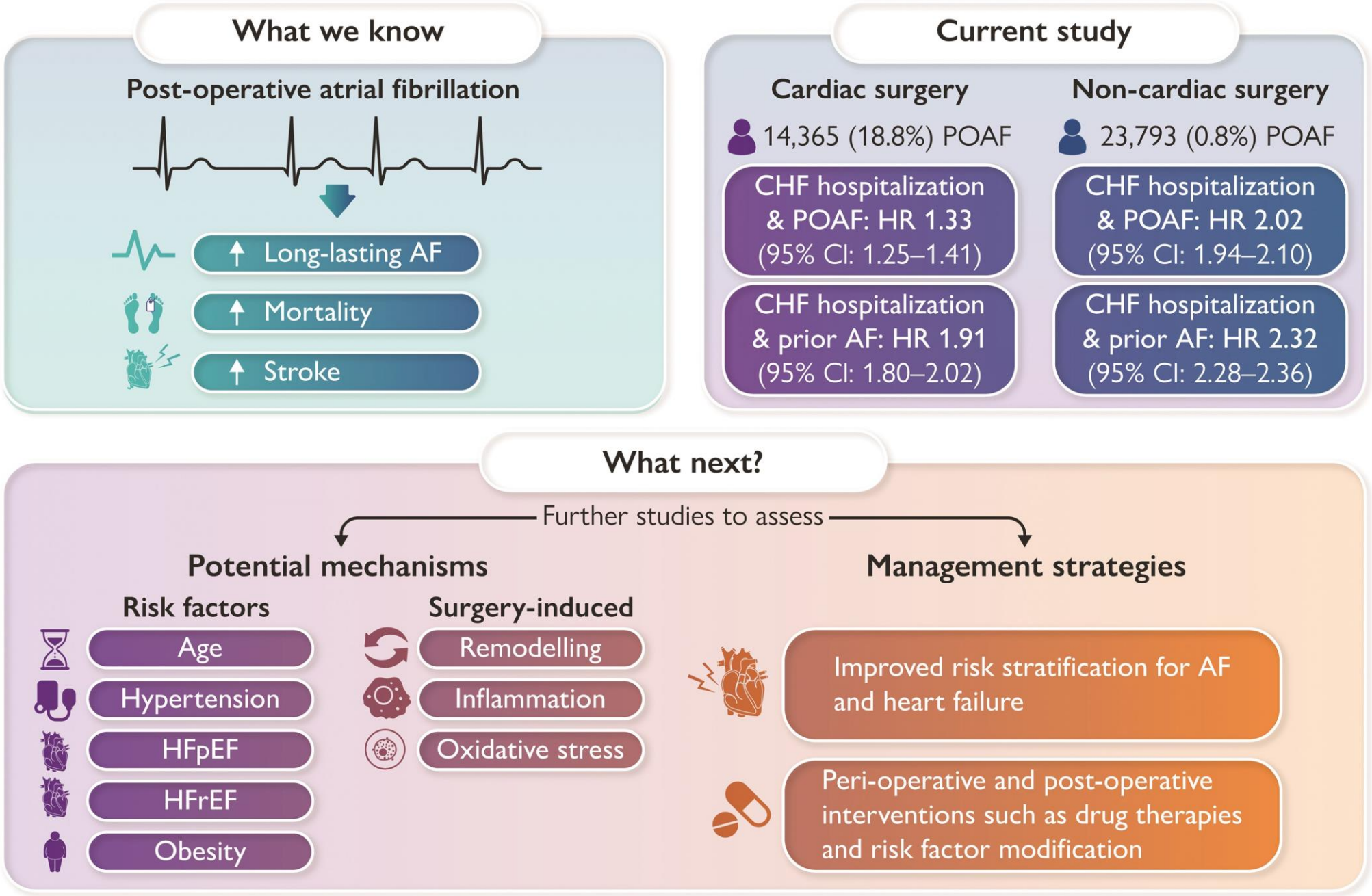

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European Heart Journal, Volume 43, Issue 31, 14 August 2022, Pages 2981–2983,

Incidence and recurrence of new-onset atrial fibrillation detected during hospitalization for non-cardiac surgery

Can J Anaesth. 2021 Jul;68(7):1045-1056

- From 39,233 citations screened, 346 studies that enrolled a total of 5,829,758 patients met eligibility criteria.
- Only 27 studies used prospective, continuous inpatient electrocardiographic (ECG) monitoring to detect incident AF.
- Overall, the incidence of postoperative AF during hospitalization ranged from 0.004 to 50.3%, with a median [interquartile range] of 8.7 [3.8–15.0]%.
- Atrial fibrillation incidence varied with type of surgery.
- Prospective studies using continuous ECG monitoring reported significantly higher incidences of AF than those that did not (**13.9% *vs* 1.9%,** respectively; $P < 0.001$).
- A total of 13 studies (25,726 patients) with follow-up up to 5.4 years reported on AF recurrence following hospital discharge; only one study used a prospective systematic monitoring protocol.
- **Recurrence rates ranged from 0 to 37.3%.**

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Circulation
Volume 147, Issue 15, 11 April 2023; Pages e676-e698
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Disclosures

- Dr. Chyou has no relevant relationships with industry over the last 12 months to disclose.
- Spousal disclosure: Dr. Chyou's spouse received compensation from McGraw-Hills publishing for contributions to textbook.

Learning Objective

To understand the conceptual framework, acute, and long-term considerations for atrial fibrillation occurring during acute hospitalization

1) **Review the recently published American Heart Association Scientific Statement on Atrial Fibrillation Occurring During Acute Hospitalization**
2) **Highlight recent and ongoing relevant studies**

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Acute AF Defined

Acute AF is defined as AF detected in the setting of acute care or acute illness; this includes AF occurring during acute hospitalization.

The acute AF may be detected or managed for the first time during acute hospitalization for another condition.

Moved away from secondary AF

Acute AF occurs in a wide range of medical and surgical conditions

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Chyou, JY et al. *Circulation* 2023

Significance

Increasing incidence (likely parallel broad increase in incident AF with aging population)

Manifest across a range of medical and surgical settings

Associated with longer length of hospitalization, greater morbidity, mortality, high rates of subsequent recurrence of AF

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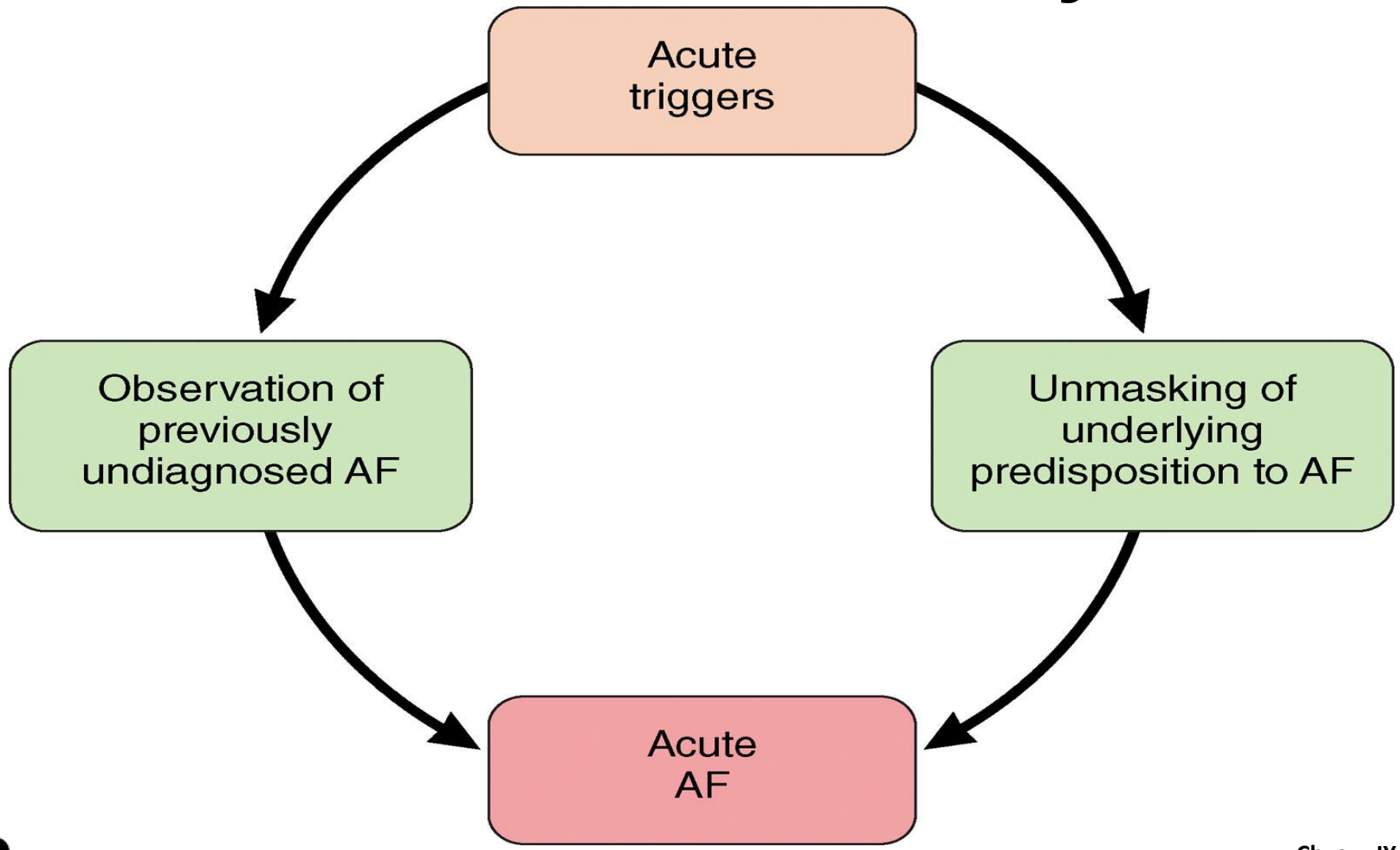
Chyou, JY et al. *Circulation* 2023

Mechanistic Pathways



Chyou, JY et al. *Circulation* 2023

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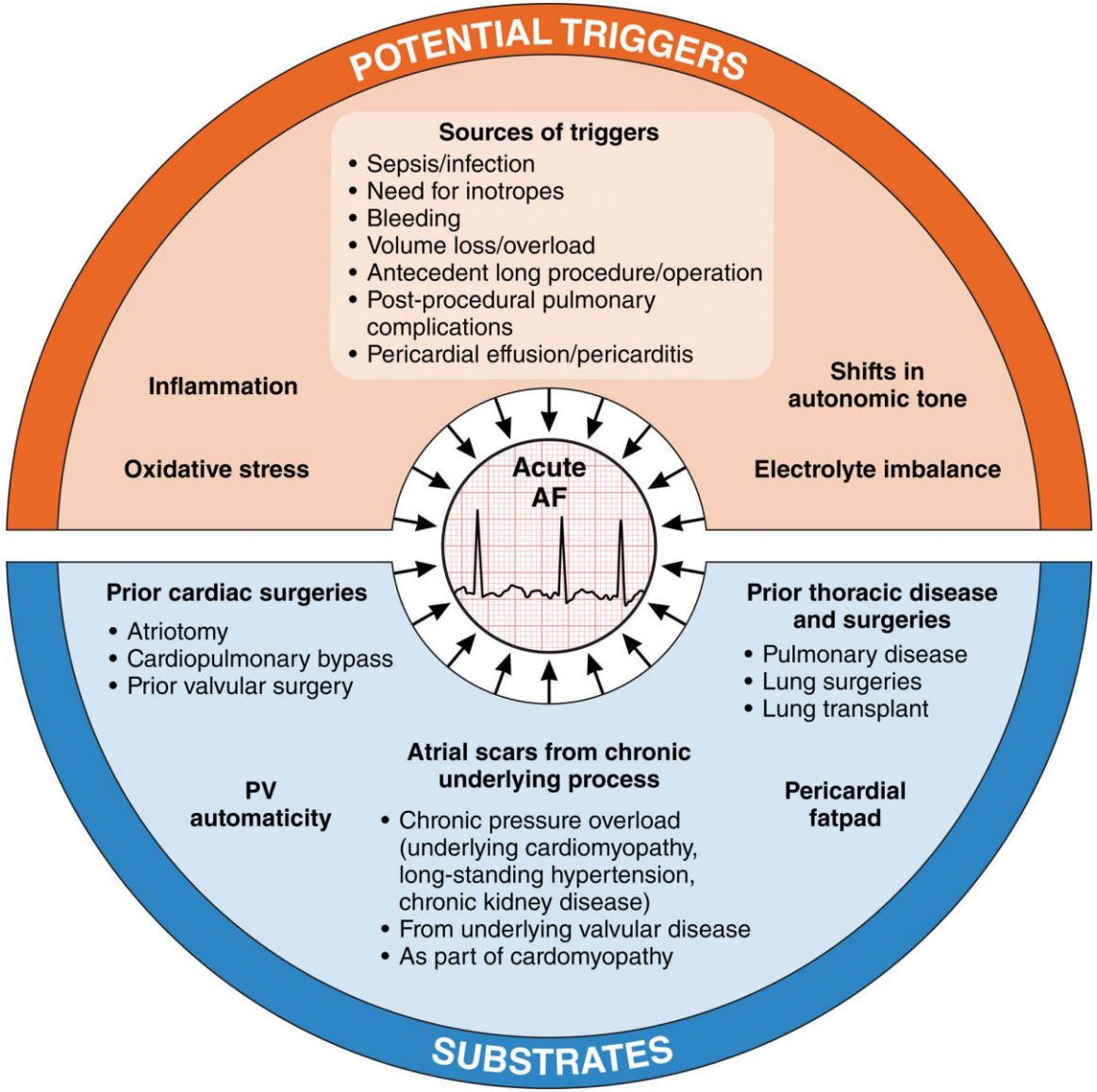
Conceptual Framework: Substrates & Triggers



Chyou, JY et al. *Circulation* 2023

Management approach begins with triage based on hemodynamic stability

Hemodynamically unstable AF

Management with immediate electrical cardioversion to restore sinus rhythm

Recommendations for Electric Therapies for Atrial Fibrillation/ Flutter		
COR	**LOE**	**Recommendations**
1	C-LD	1. Hemodynamically unstable patients with atrial fibrillation or atrial flutter with rapid ventricular response should receive electric cardioversion.

ACLS (Panchal, AR et al. *Circulation*. 2020); AHA/ACC/HRS (January, CT et al. *Circulation*. 2014); ESC (Hindricks, G et al. *Eur Heart J* 2021)

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In hospitalized patients with hemodynamically stable acute AF

Hemodynamically Stable AF

Acute Management & Preference for Rhythm Control depend on

- Symptoms
- Patient tolerance of AF
- Ability to adequately rate control
- Ongoing acute illness
- Underlying comorbidities
- Candidacy and feasibility for anticoagulation

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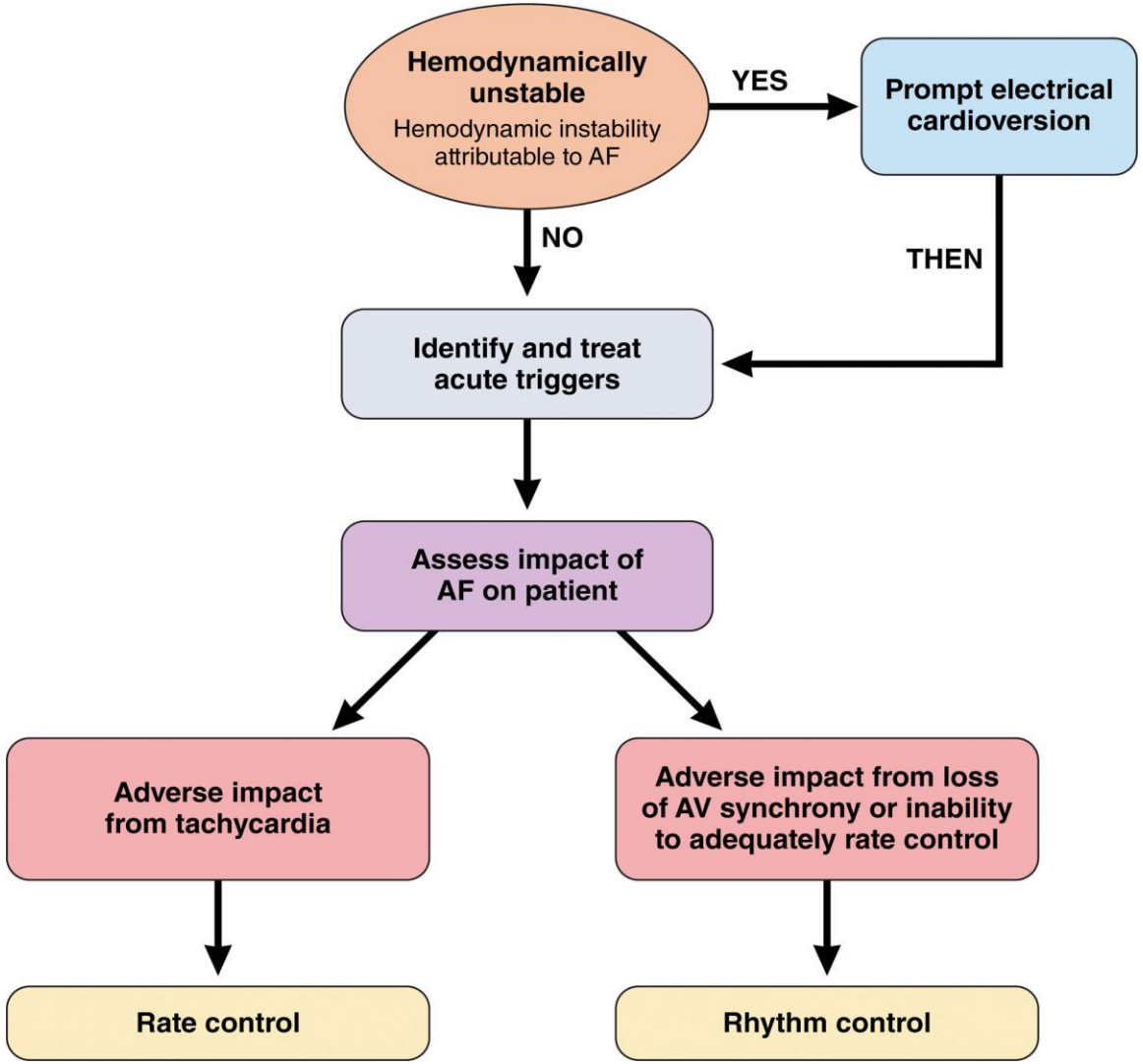
Approach to Acute Management of triggers, rate vs. rhythm control strategy in acute AF

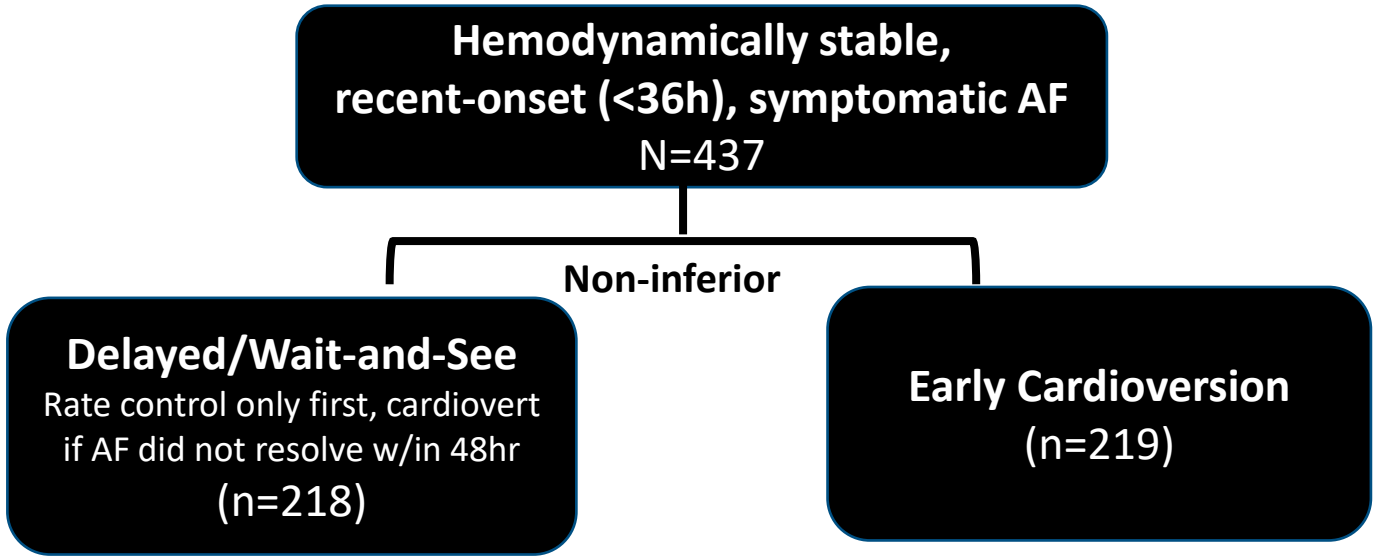


Chyou, JY et al. *Circulation* 2023

Cardioversion of hemodynamic stable acute AF

When: RACE 7

Early or Delayed Cardioversion in Recent-Onset Atrial Fibrillation



"Wait-and-see" approach non-inferior

Pluymaekers, N et al. *New Engl J Med* 2019

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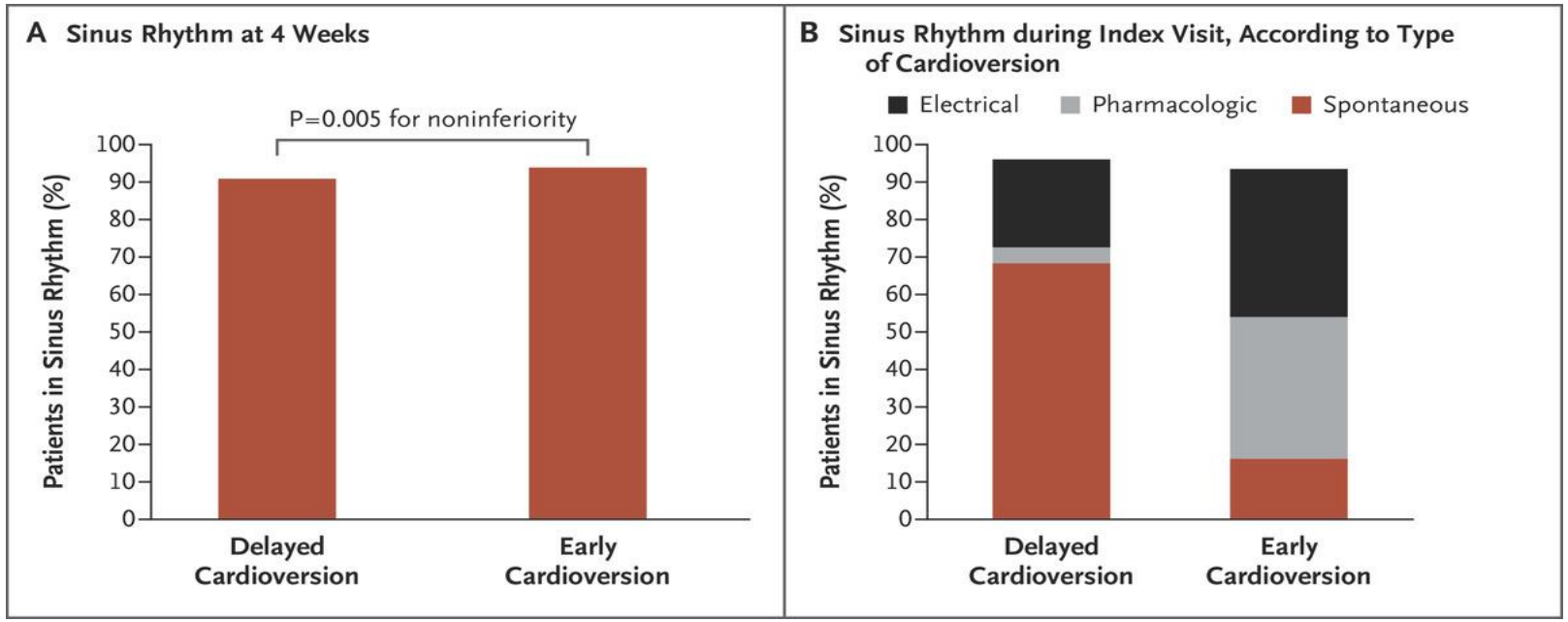
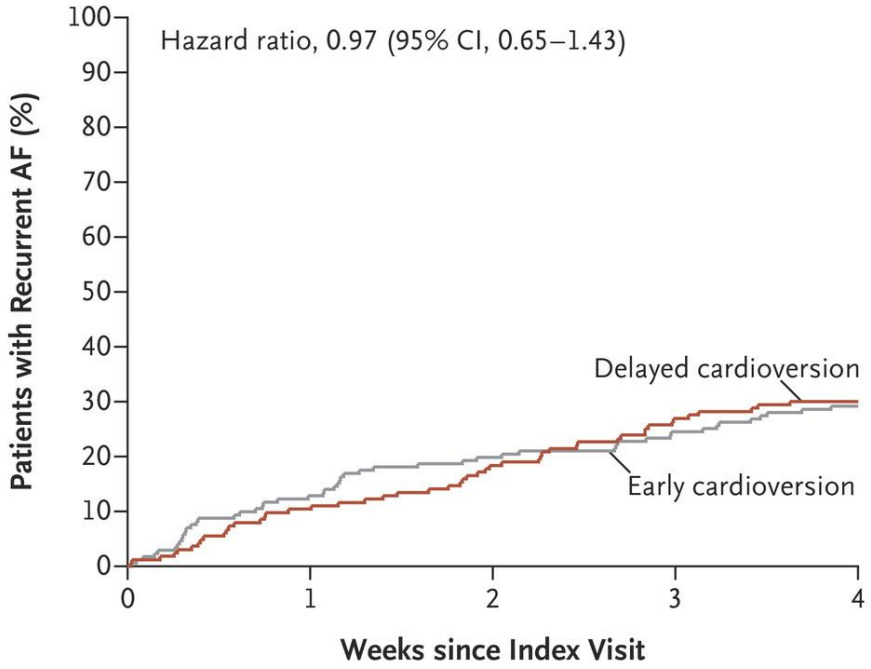
“Wait-and-see” approach non-inferior

Spontaneous conversion



Similar recurrence at 4 weeks



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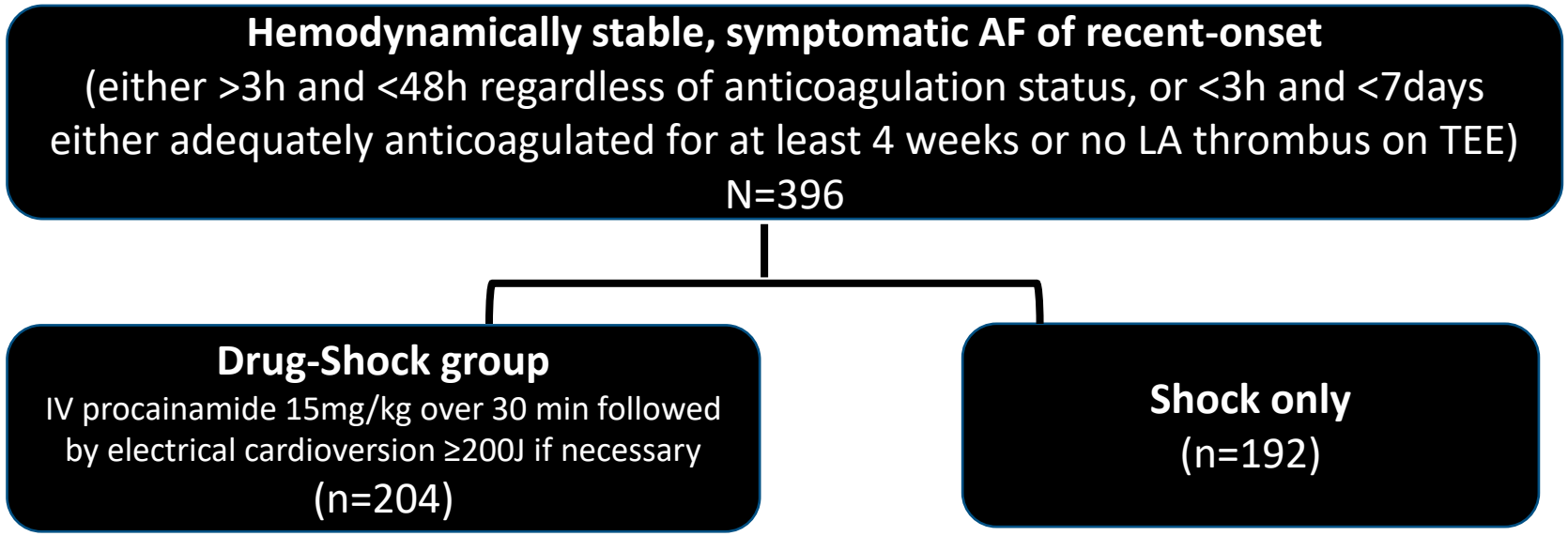
Pluymaekers, N et al. *New Engl J Med* 2019

Cardioversion of hemodynamic stable acute AF

How: RAFF2



For patients with AF of recent onset planned for rhythm control strategy, comparable efficacy and safety for drug then shock vs. shock only approach.

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Stiell, IG et al. *Lancet* 2020

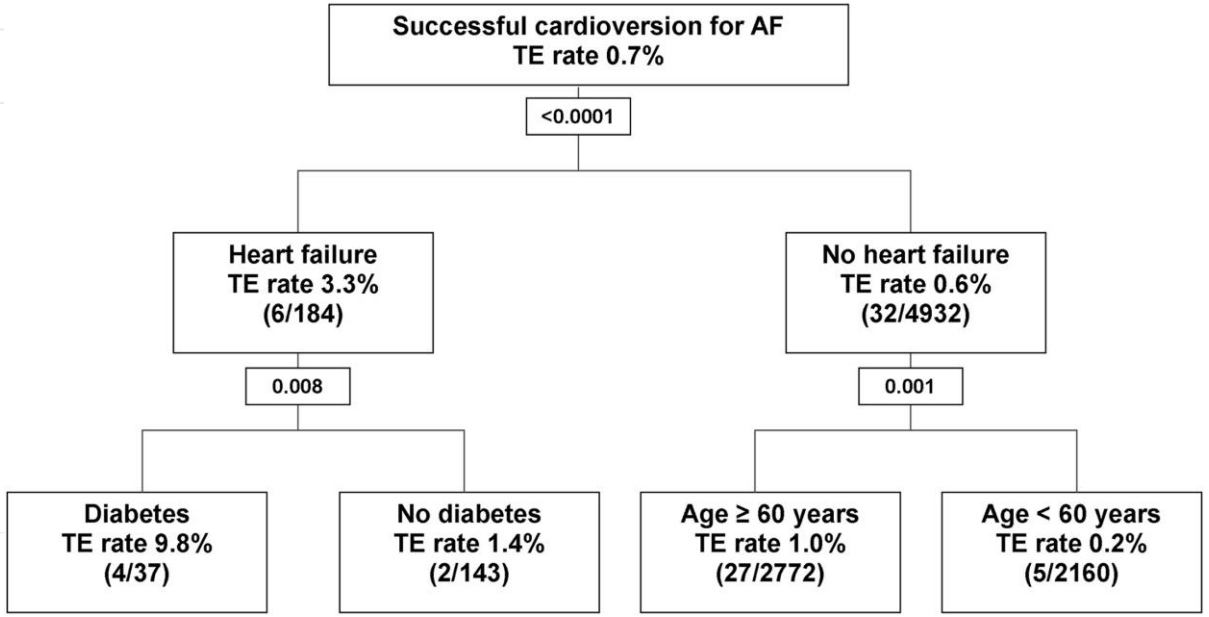
AF <48h, thromboembolic risks?

May not be universally low

<48h w/o anticoagulation: differential thromboembolic risks by patient risk factors

	OR (95% CI)	p Value	OR (95% CI)	p Value
Age	1.07 (1.04–1.10)	<0.001	1.05 (1.02–1.08)	<0.001
Female	2.95 (1.54–5.65)	0.001	2.06 (1.06–3.98)	0.03
Heart failure	5.17 (2.02–13.20)	<0.001	2.85 (1.12–7.24)	0.03
Diabetes	3.11 (1.41–6.89)	0.005	2.28 (1.07–4.87)	0.03
Vascular disease	2.82 (1.48–5.40)	0.002	1.61 (0.82–3.15)	0.17
Aspirin or clopidogrel	2.07 (1.05–4.07)	0.04		

CI = confidence interval; OR = odds ratio.



Airaksinen, KE et al. *J Am Coll Cardiol* 2013

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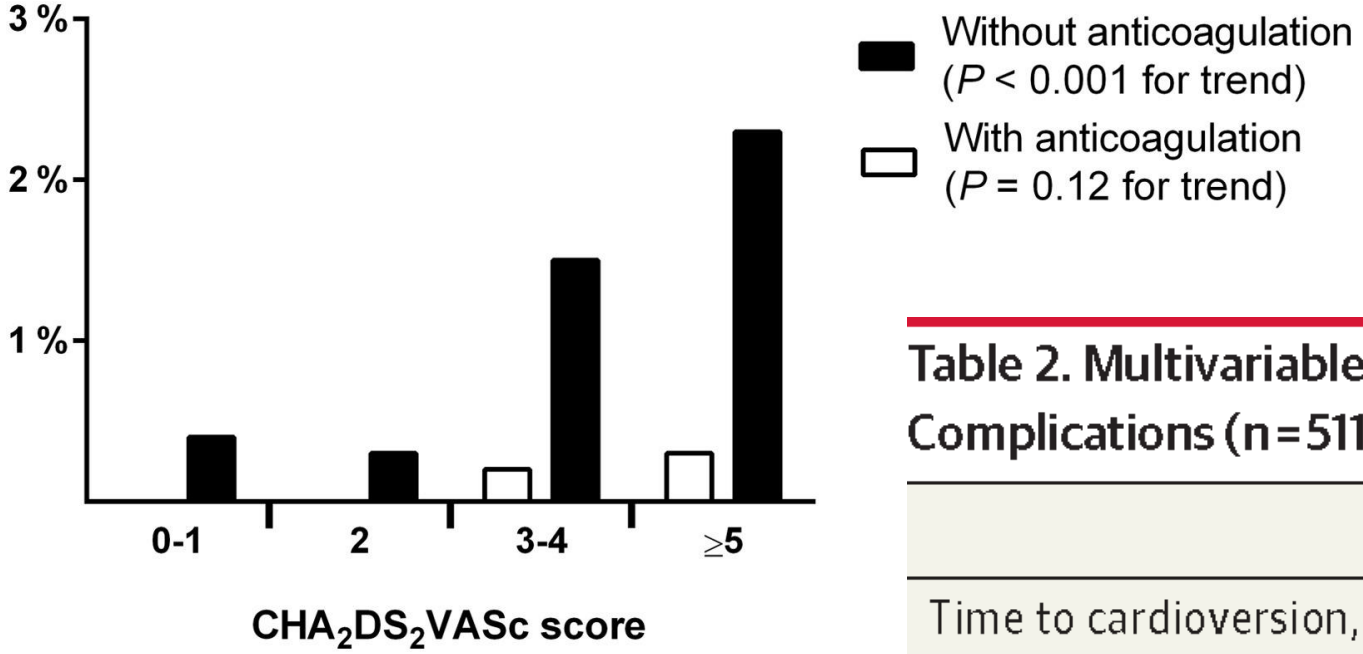
AF <48h, thromboembolic risks?

May not be universally low

By CHA2DS2Vasc, reduction of risks with anticoagulation



Differential risks by duration

Table 2. Multivariable Analysis of Risk Factors for Thromboembolic Complications (n=5116)

	Odds Ratio (95% CI)[a]	*P* Value
Time to cardioversion, h		
12-24 vs <12	4.0 (1.7-9.1)	.001
24-48 vs <12	3.3 (1.3-8.9)	.02

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Nuotio, I et al, *JAMA* 2014; Grönberg, T et al. *Am J Cardiol,* 2016

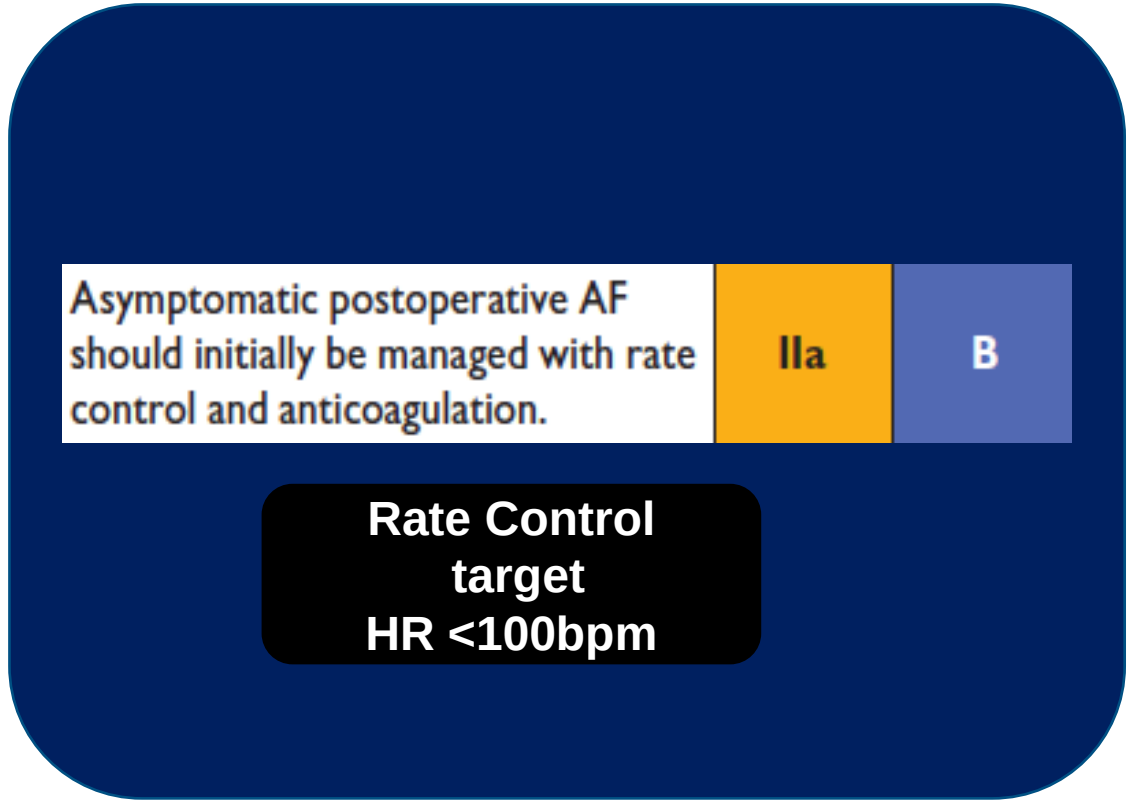
AF after cardiac surgery is a distinct form of acute AF

POAF: Rate vs. Rhythm Control

Rate Control vs. Rhythm Control for AF after Cardiac Surgery (CTSN)
N= 523

- Rate Control (HR <100bpm) n=262
- Rhythm Control (amiodarone) n=261

Comparable endpoints of hospitalization and readmission



Gillinov AM, et al. *N Engl J Med*. 2016; Kirchhof P, et al. *Eur Heart J*.2016; Hindricks, G et al. *Eur Heart J* 2021

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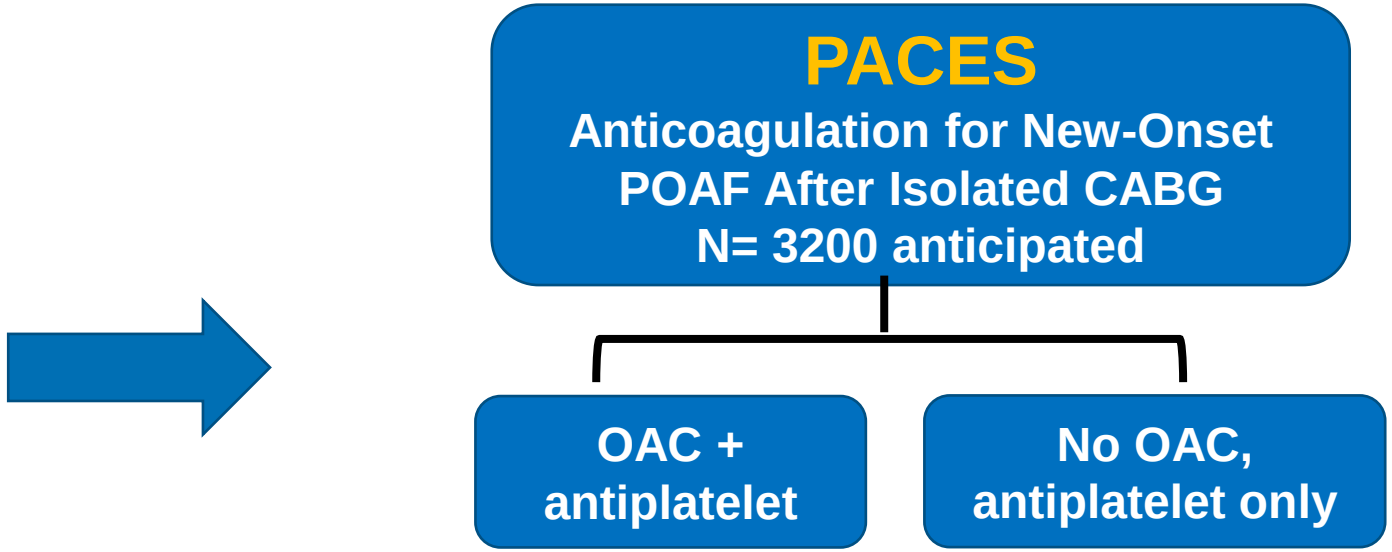
POAF: Anticoagulation

Currently based on CTSN rate vs. rhythm control trial protocol:

If pt remains in POAF or had recurrent AF **≥48hrs**, anticoagulate with warfarin, bridging allowed



OAC = oral anticoagulant as warfarin (INR 2-3) or DOAC (apixaban, rivaroxaban, edoxaban or dabigatran)

Gillinov AM, et al. *N Engl J Med*. 2016

In the broader acute AF in the hospitalized patient population: RCTs on anticoagulation

Post Non-cardiac Surgery:

- **ASPIRE** (NCT03968393)

AF-related stroke:

Early versus late initiation of anticoagulation using DOACs for AF-related stroke

- **ELAN** (NCT03148457)
- **OPTIMAS** (NCT03759938)
- **TIMING** (NCT02961348)
- **START** (NCT03021928)]

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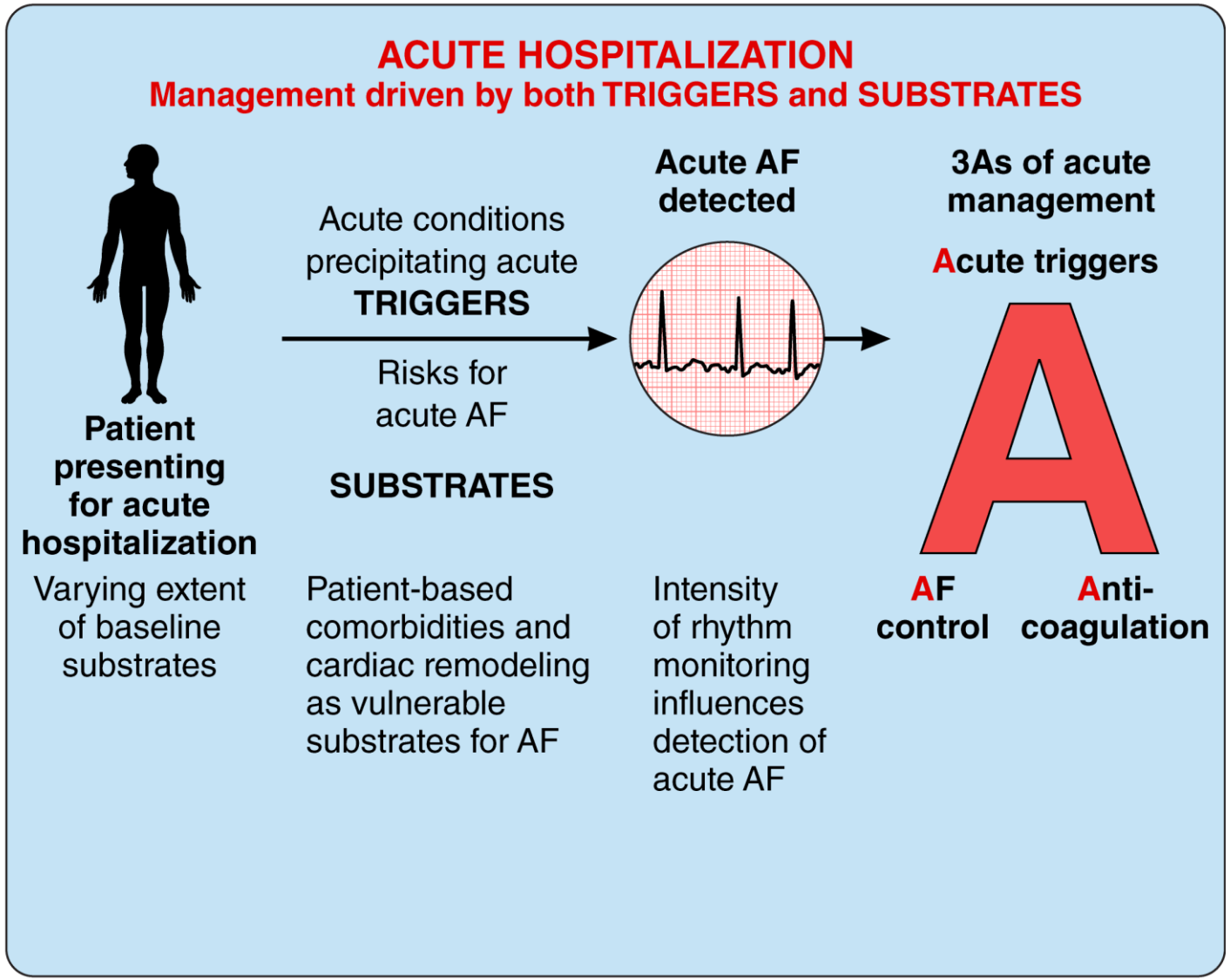
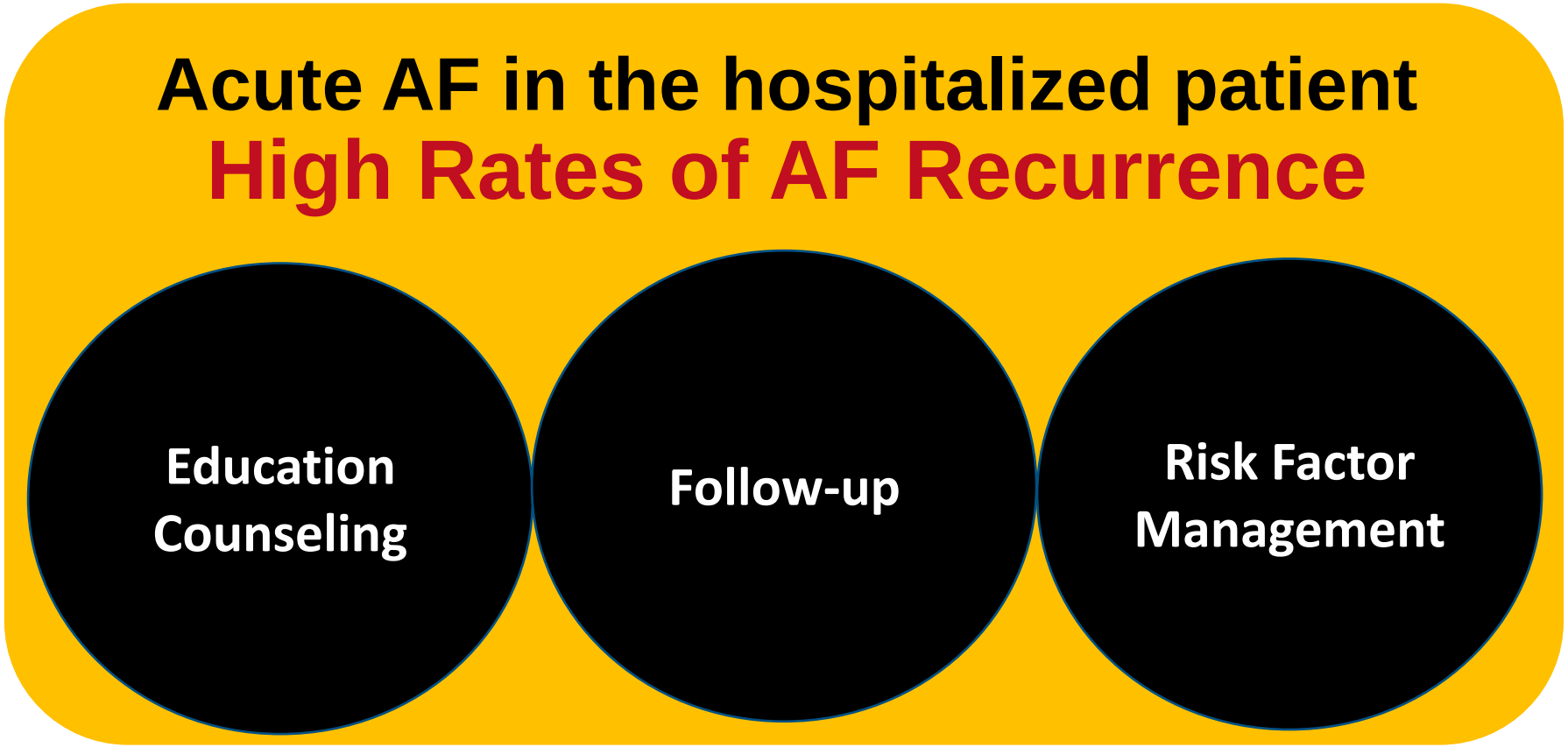
Management During Acute Hospitalization



Chyou, JY et al. *Circulation* 2023

High AF recurrence after acute hospitalization



5-year recurrence with acute AF in the setting of
- Acute medical illness: 42%-68%
- Noncardiac surgeries: 39%
- Cardiac surgeries (valves, CABG): 39%-76%

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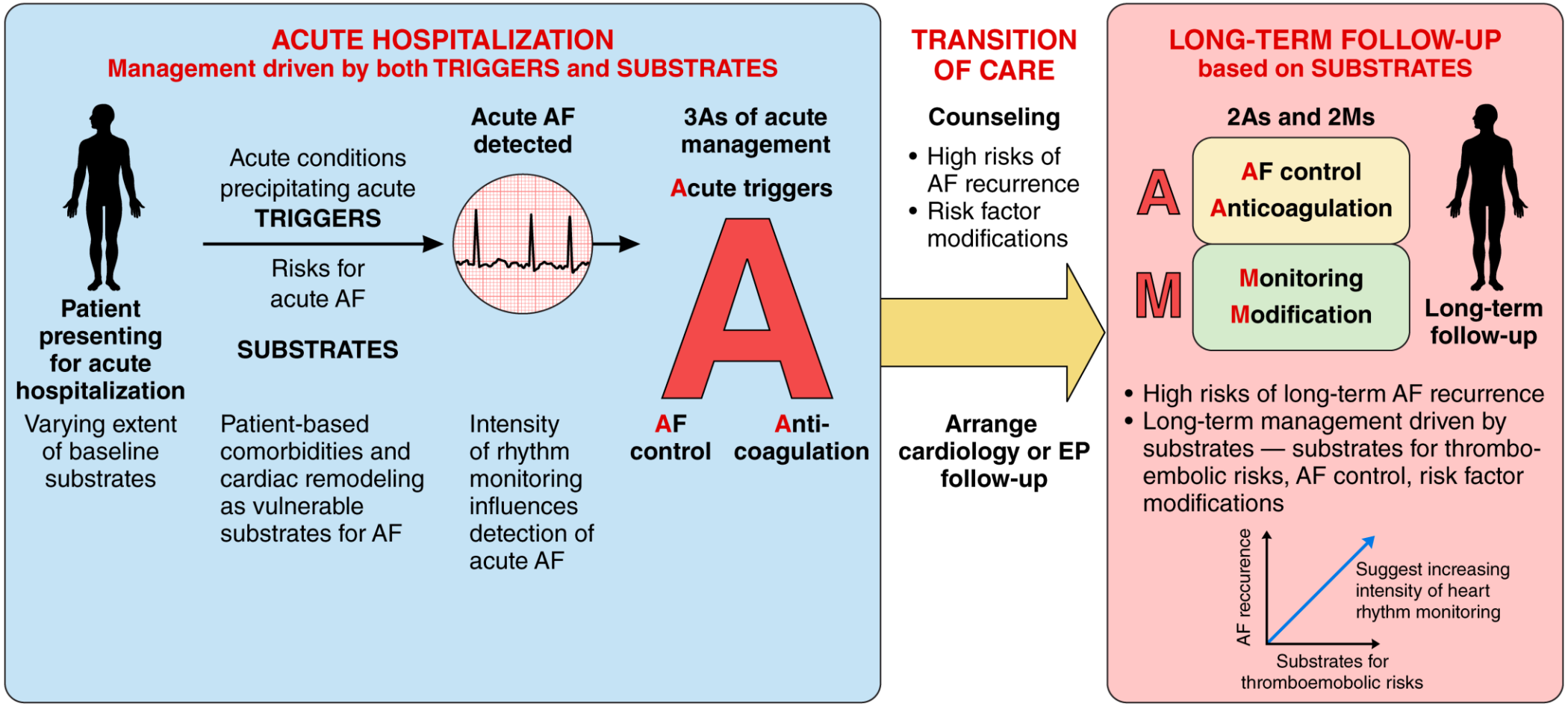
Warrants attention at Transition of Care and Long-term Follow-up



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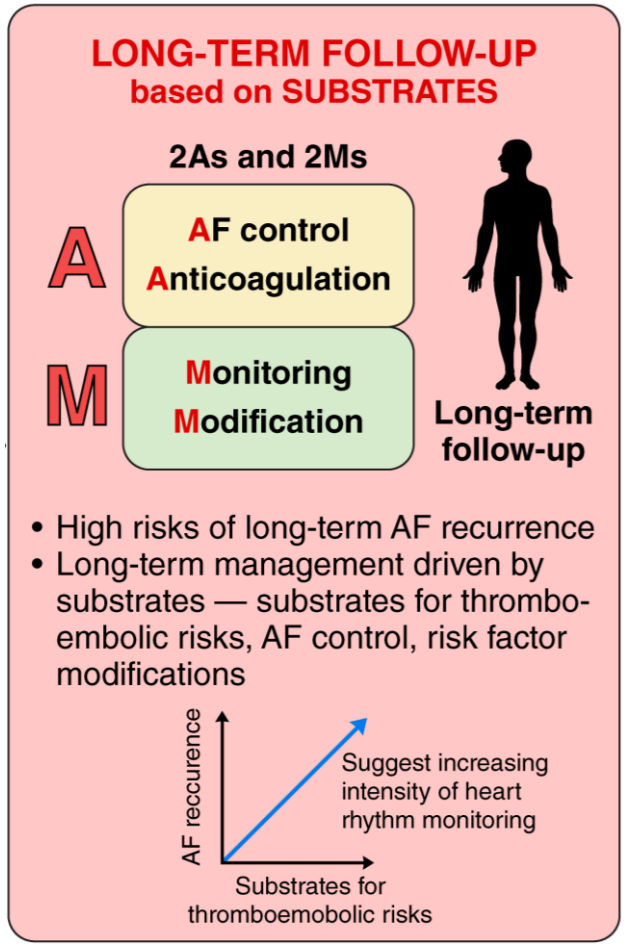
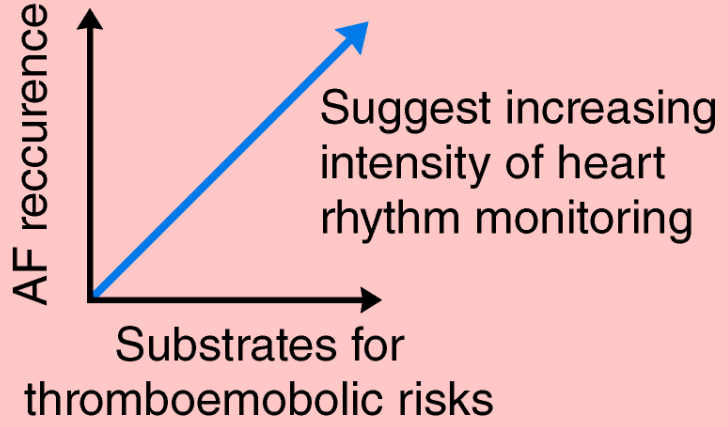
Long-term Follow-up Driven by Substrates



- High risks of long-term AF recurrence
- Long-term management driven by substrates — substrates for thrombo-embolic risks, AF control, risk factor modifications



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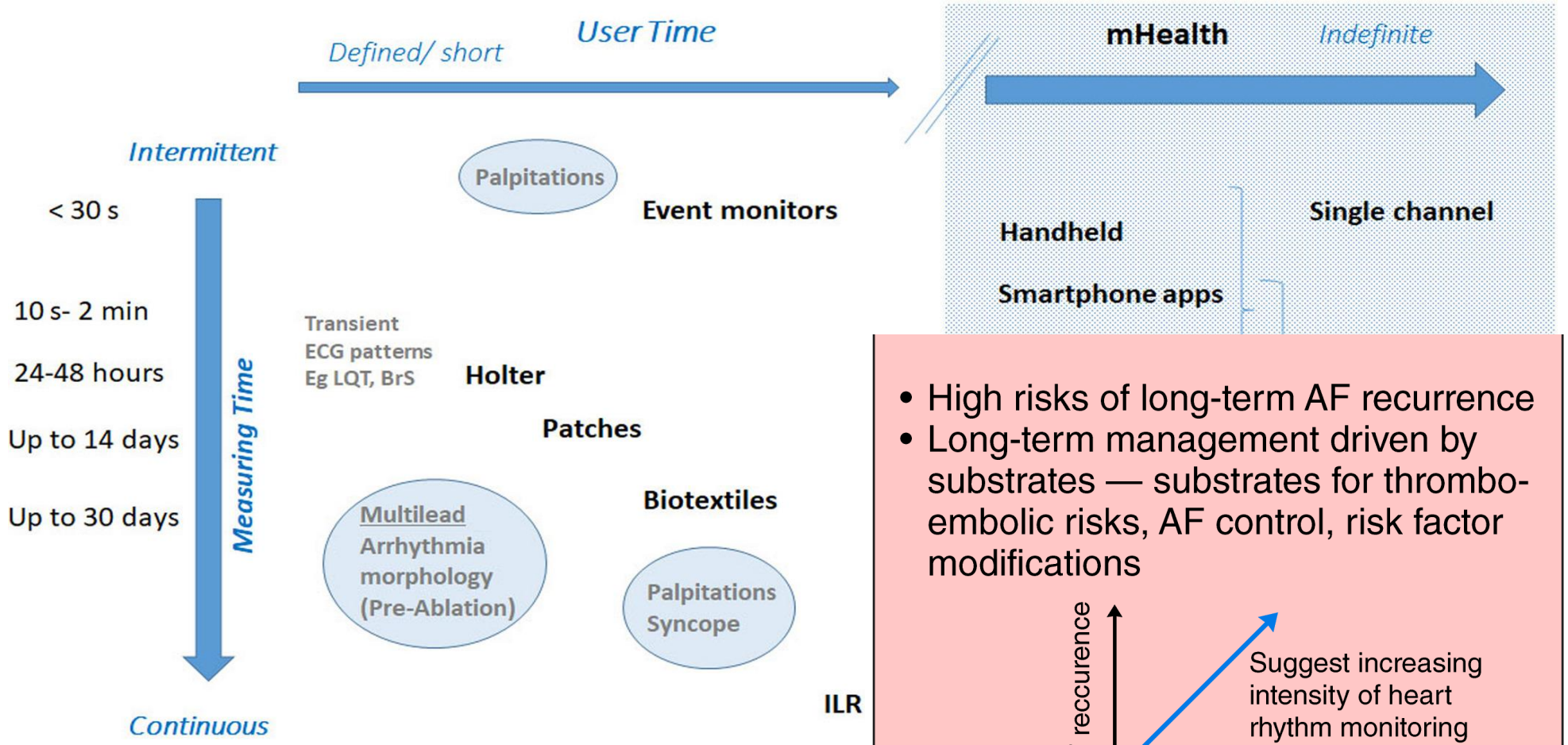
Monitoring



- High risks of long-term AF recurrence
- Long-term management driven by substrates — substrates for thrombo-embolic risks, AF control, risk factor modifications

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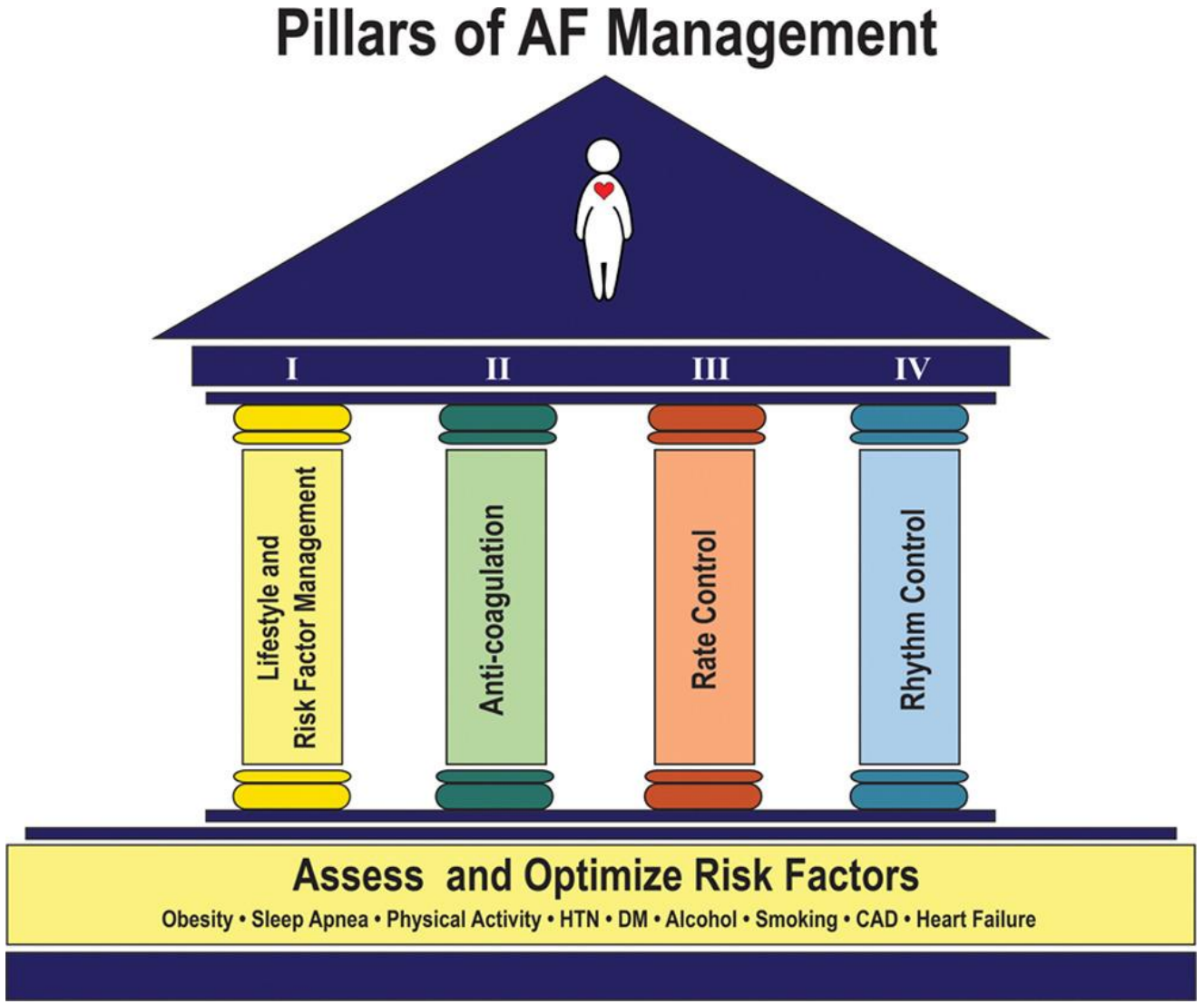
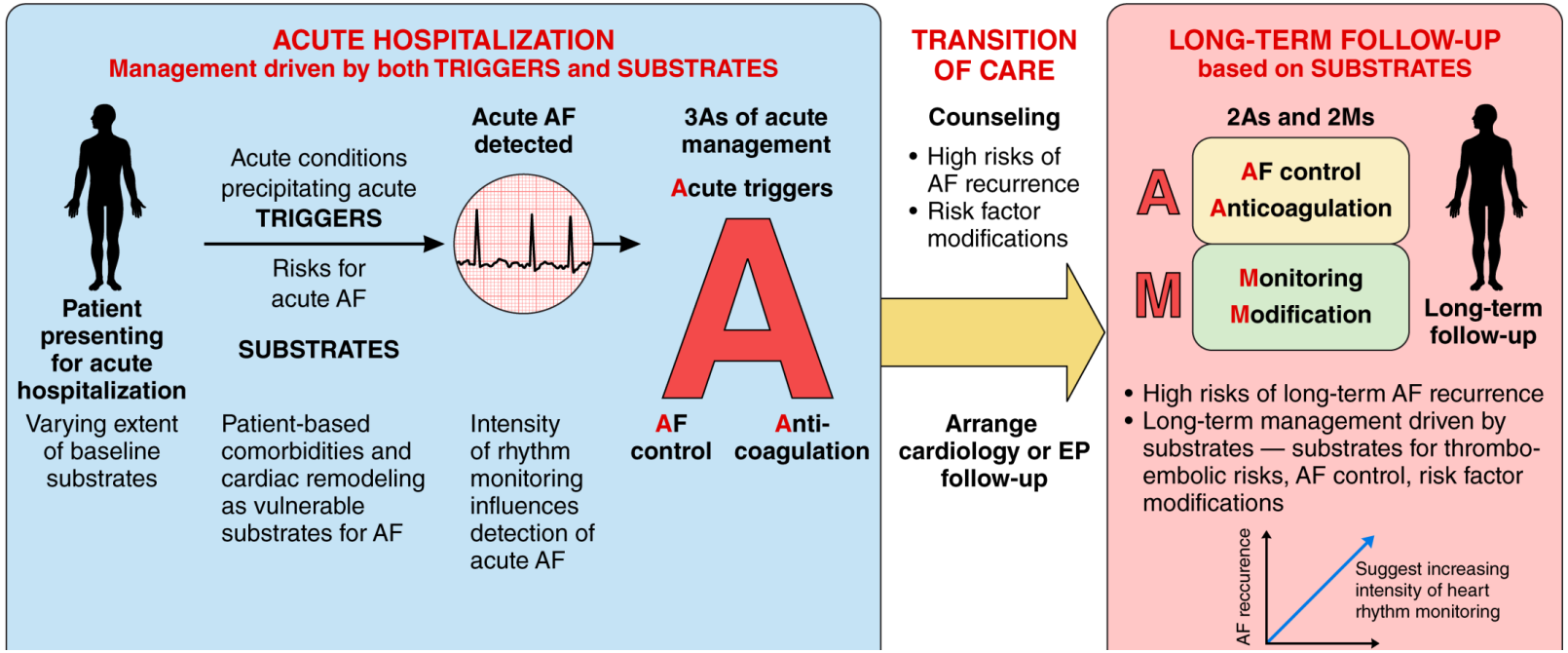
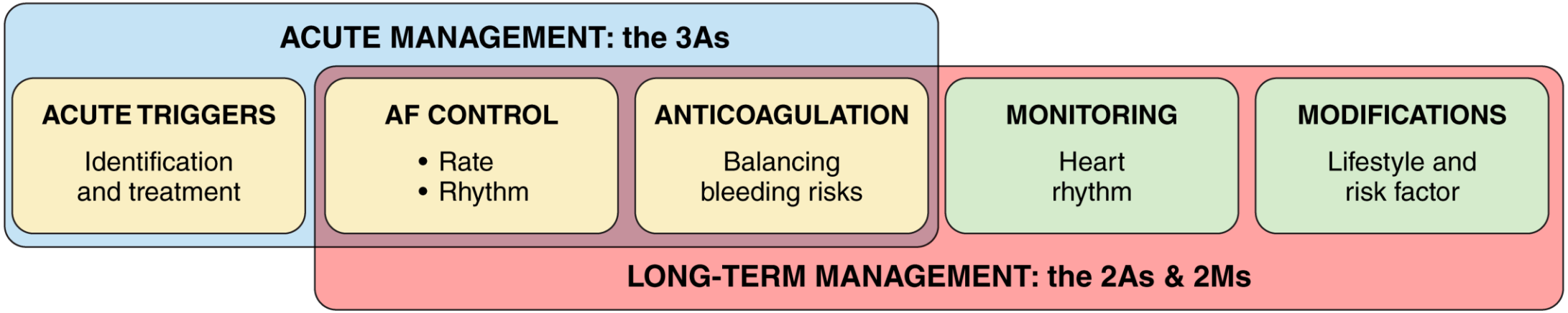
Verma, A et al, 2021 ; Chyou, JY et al. *Circulation* 2023

Modification of Lifestyle and Risk Factors



Chung, MK et al. *Circulation* 2020





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Thank you

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Discussion