



Impact of Frailty on Early Rhythm Control Outcomes in Older Adults with Atrial Fibrillation



Ga-In Yu

Division of Cardiology , Department of Internal Medicine,
GyeongSang National University Changwon Hospital,
GyeongSang National University College of Medicine,
Republic of Korea.

Korean Heart Rhythm Society Disclosure

The author have no financial conflicts of interest
to disclose concerning the presentation



Korean Heart Rhythm Society Disclosure

*Ga-In Yu¹; Daehoon Kim²; Hee Tae Yu²; Tae-Hoon Kim²; Jung-Hoon Sung³;
Hui-Nam Pak²; Moon-Hyoung Lee²; Gregory Y.H. Lip⁴; Pil-Sung Yang³; Boyoung Joung^{2*}*

¹GyeongSang National University Changwon Hospital, Changwon, Republic of Korea

²Severance Hospital, Yonsei University College of Medicine, Seoul, Republic of Korea

³CHA Bundang Medical Center, CHA University, Seongnam, Republic of Korea

⁴Liverpool Heart & Chest Hospital, University of Liverpool, Liverpool, United Kingdom

The authors have no financial conflicts of interest to disclose concerning the presentation



Disclosure

- This work was supported by a grant from the Patient-Centered Clinical Research Coordinating Center (PACEN) funded by the Ministry of Health & Welfare, Republic of Korea (grant numbers: HC19C0130).
- The funders had no role in the study design, collection, analysis and interpretation of data, writing of the report, or the decision to submit the report for publication.



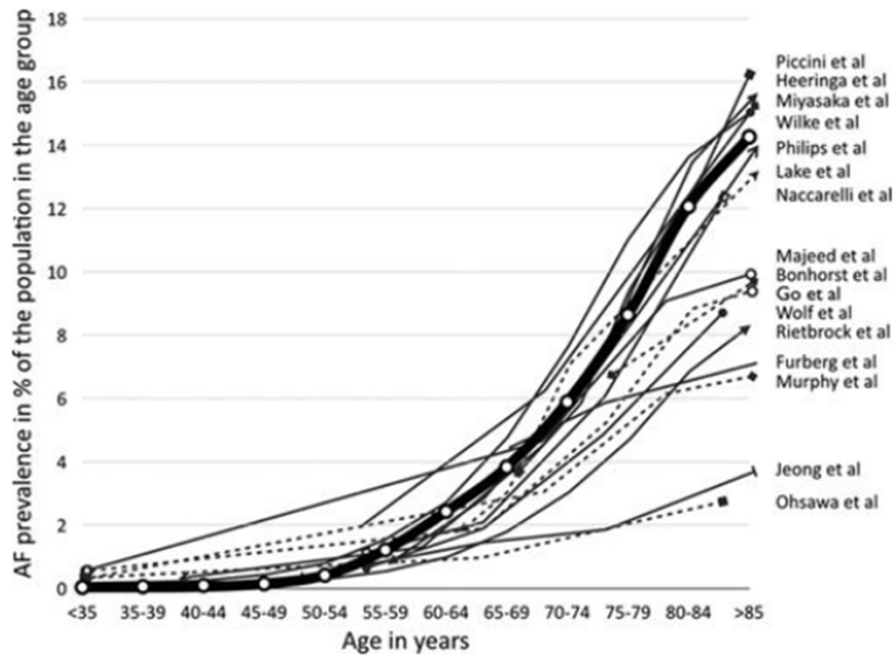
Contents

- Management of the Atrial Fibrillation (AF)
- Early rhythm control therapy in AF
- Assessment of frailty on old age
- Impact of frailty on early rhythm control outcomes in older age with AF

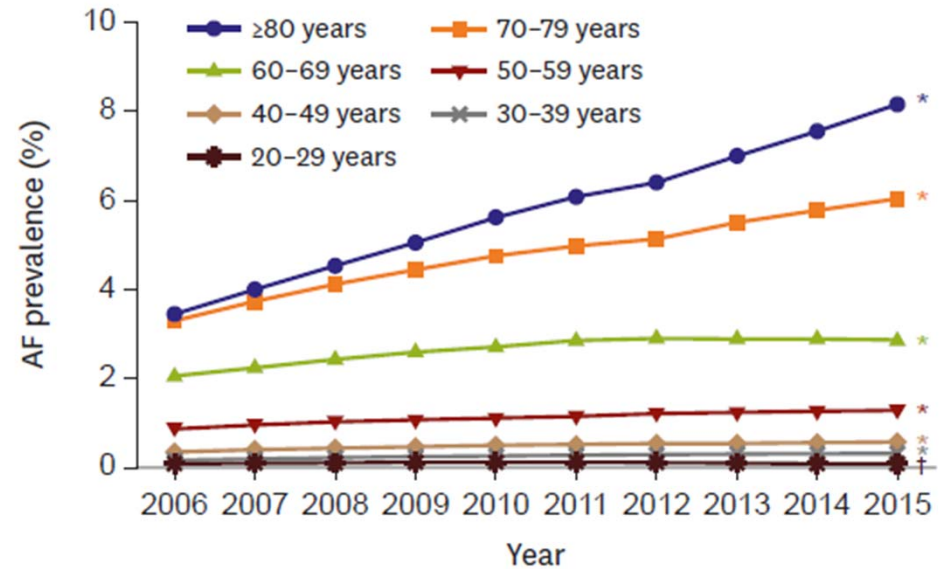


Prevalence of AF

Worldwide







Korea







Andrade J, et al. *Circulation Research*. 2014;114:1453-1468.
 Joung BY, et al. *Korean Circ J*. 2018 Dec;48(12):1033-1080.



AF related outcomes

AF-Related Outcome	Frequency in AF	Mechanism(s)
 Death	1.5 - 3.5 fold increase	Excess mortality related to: <ul style="list-style-type: none"> • HF, comorbidities • Stroke
 Stroke	20-30% of all ischaemic strokes, 10% of cryptogenic strokes	<ul style="list-style-type: none"> • Cardioembolic, or • Related to comorbid vascular atheroma
 LV dysfunction / Heart failure	In 20-30% of AF patients	<ul style="list-style-type: none"> • Excessive ventricular rate • Irregular ventricular contractions • A primary underlying cause of AF
 Cognitive decline / Vascular dementia	HR 1.4 / 1.6 (irrespective of stroke history)	<ul style="list-style-type: none"> • Brain white matter lesions, inflammation, • Hypoperfusion, • Micro-embolism

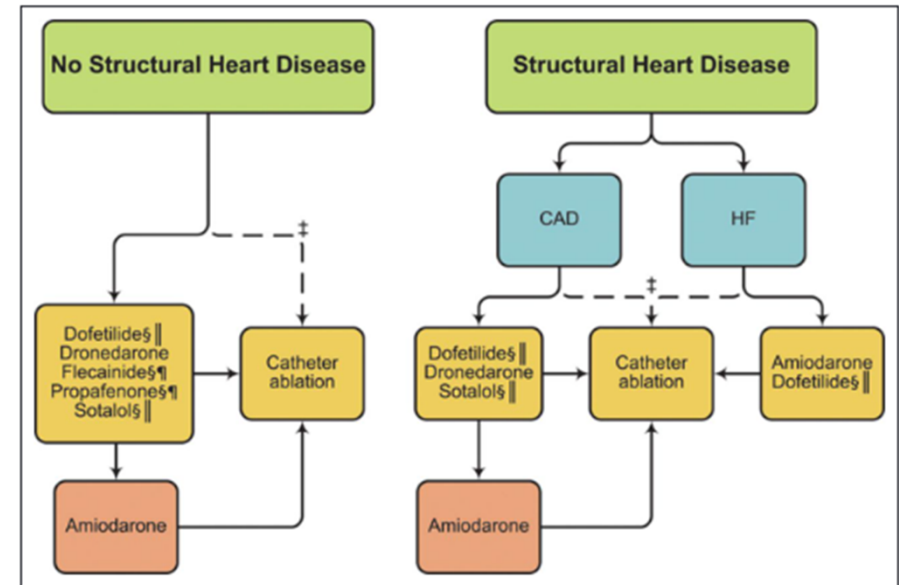
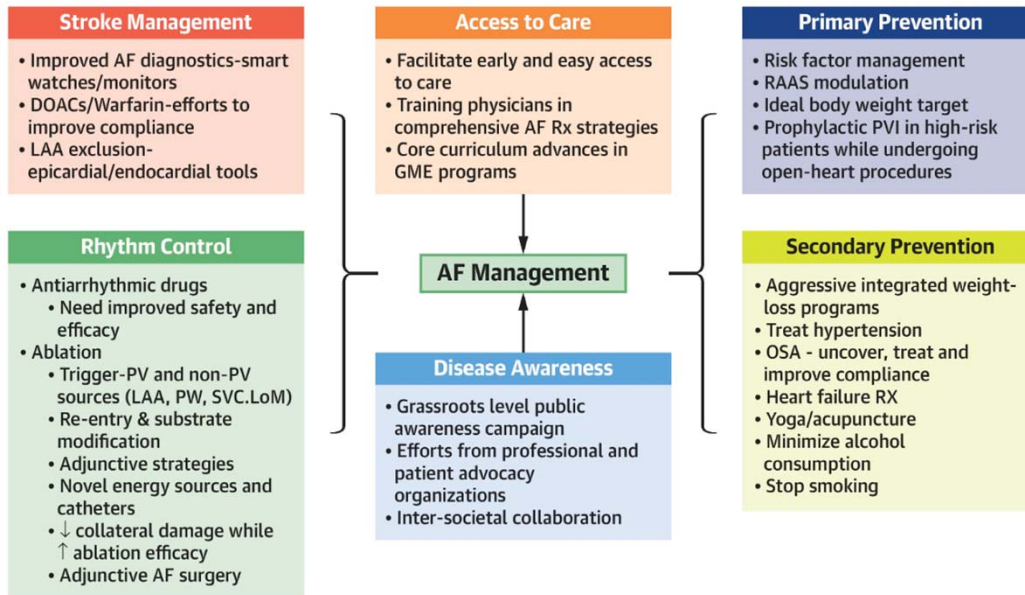
AF-Related Outcome	Frequency in AF	Mechanism(s)
 Cognitive decline / Vascular dementia	HR 1.4 / 1.6 (irrespective of stroke history)	<ul style="list-style-type: none"> • Brain white matter lesions, inflammation, • Hypoperfusion, • Micro-embolism
 Depression	Depression in 16-20% (even suicidal ideation)	<ul style="list-style-type: none"> • Severe symptoms and decreased QoL • Drug side effects
 Impaired quality of life	>60% of patients	<ul style="list-style-type: none"> • Related to AF burden, comorbidities, psychological functioning and medication • Distressed personality type
 Hospitalizations	10-40% annual hospitalization rate	<ul style="list-style-type: none"> • AF management, related to HF, MI or AF related symptoms • Treatment-associated complications

Hindricks G, et al. *Eur Heart J.* 2020;42:373–498.



Management of AF (AHA/ACC/HRS 2019)

Strategies for rhythm control in patients with AF



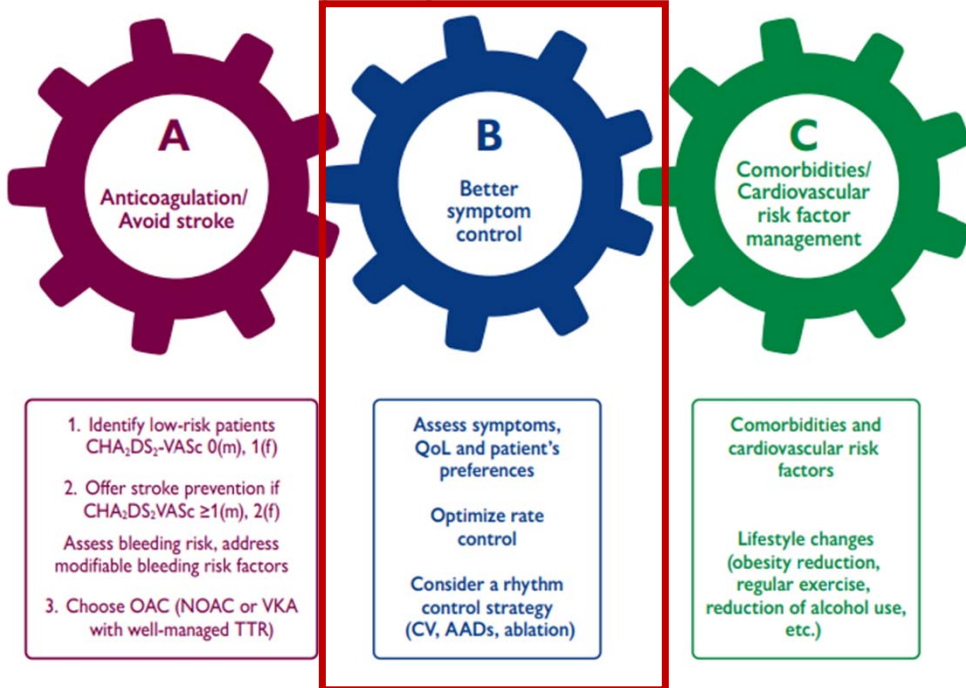
Rhythm control strategy for AF

January CT, et al. *Circulation* 2019;140:e125-e151.
 Chung MK, et al. *J Am Coll Cardiol* 2020;75:1689-1713.

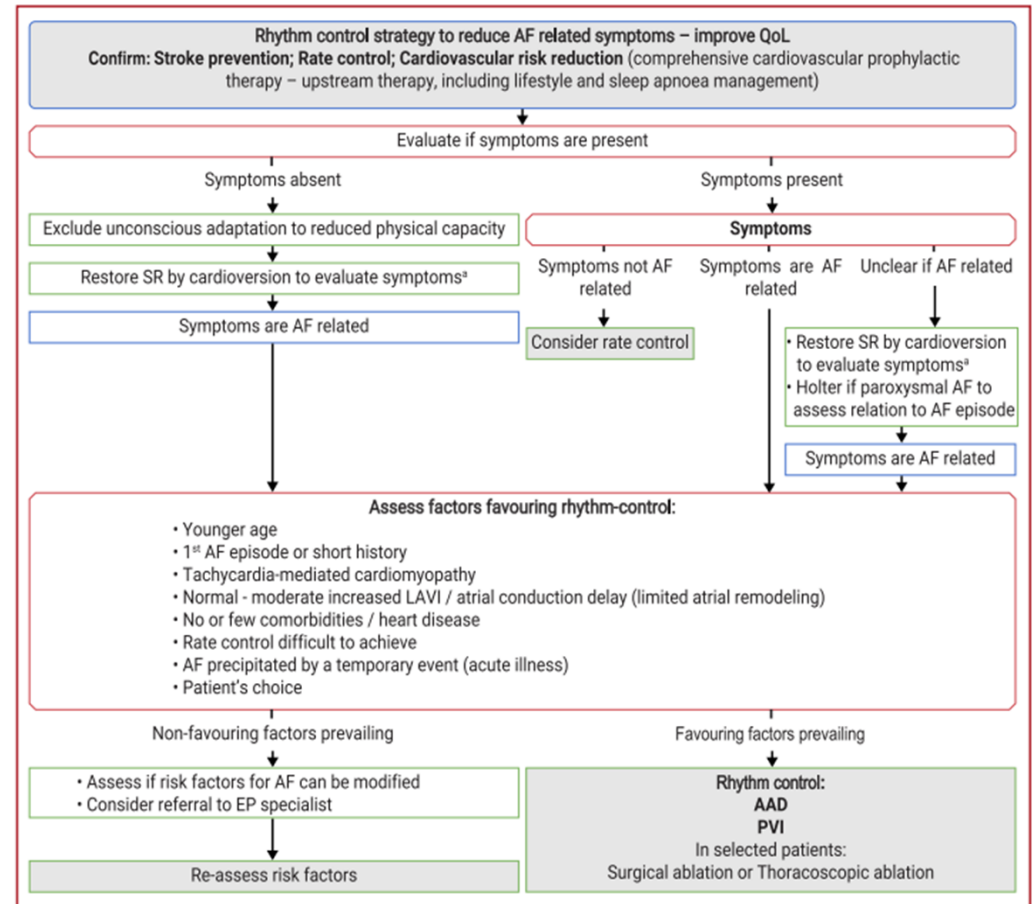


Management of AF (ESC 2020)

Treat AF: The ABC pathway



**Rec rhythm control therapy
for better symptom control**



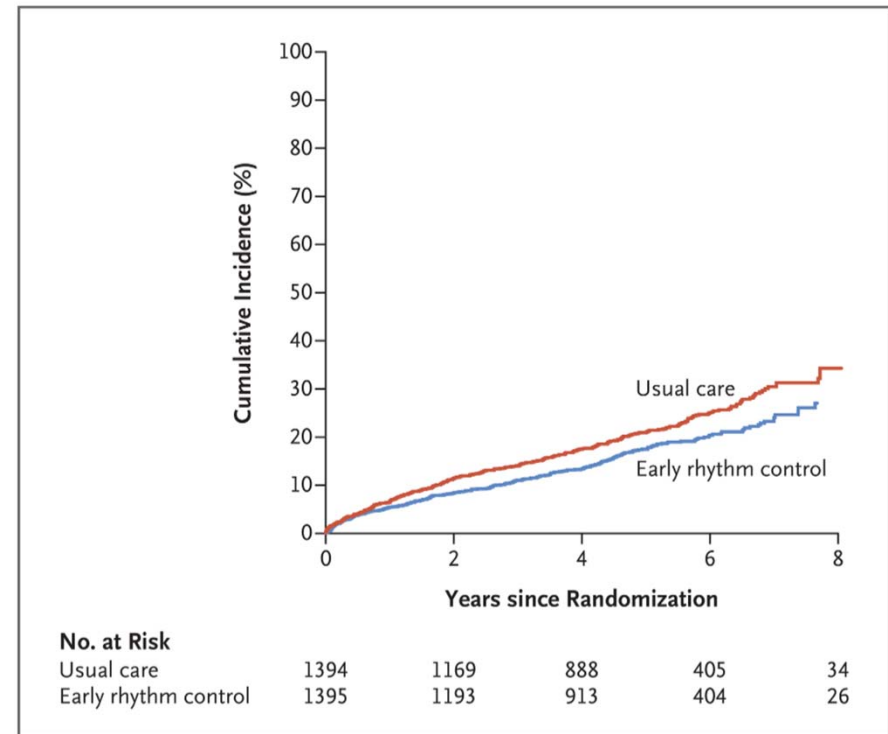
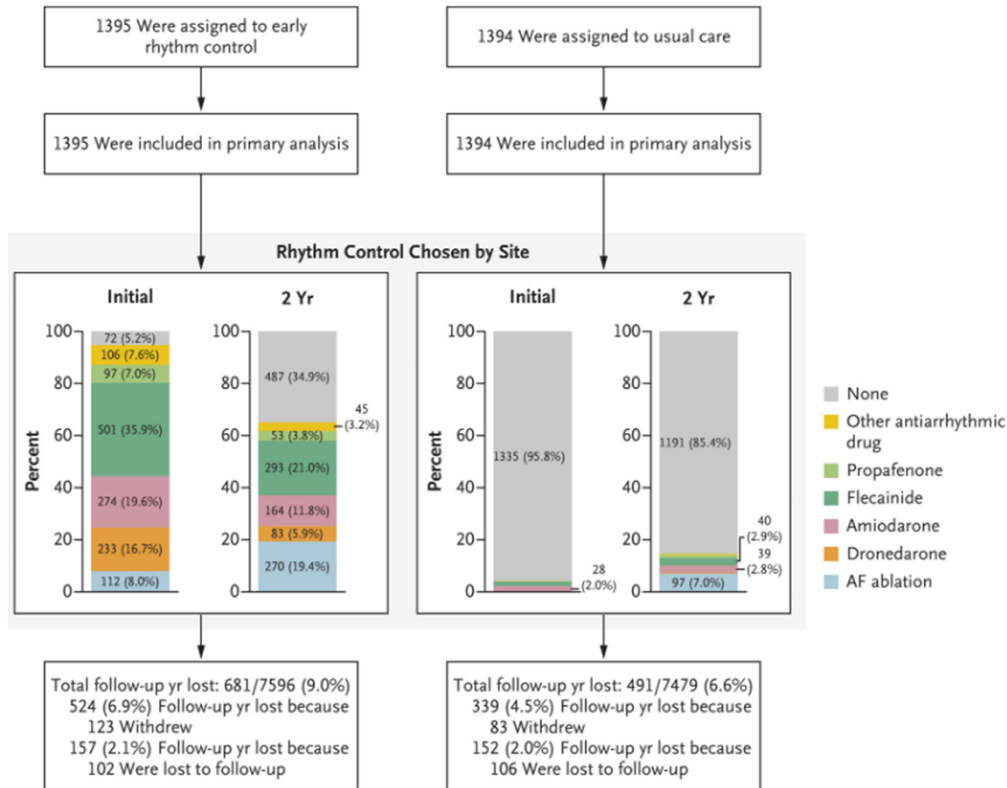
Hindricks G, et al. *Eur Heart J.* 2020;42:373–498.

KHRS 2023



Early rhythm control therapy in AF

Outcome of early rhythm control vs. usual case in AF



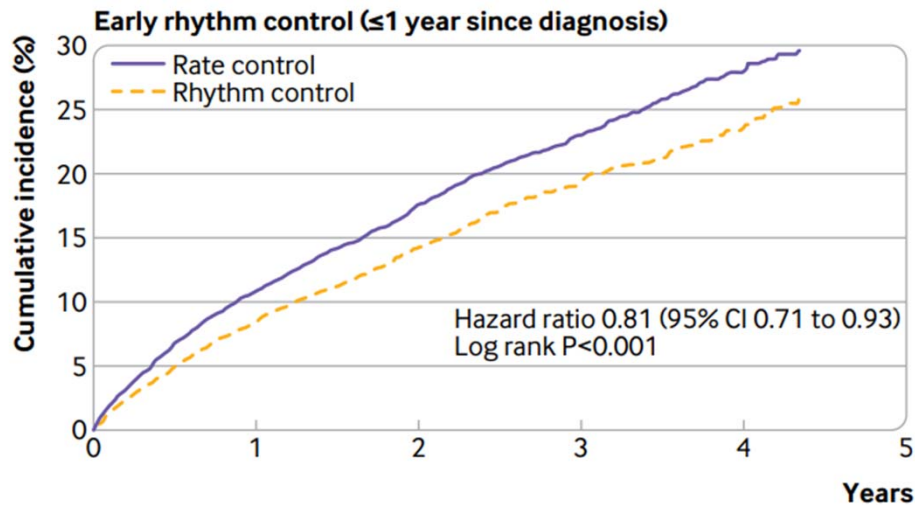
Kirchhof P, et al. *N Engl J Med*. 2020;383:1305–1316.

KHRS 2023



Early rhythm control therapy in AF

Cardiovascular events outcomes in early and late treatments AF



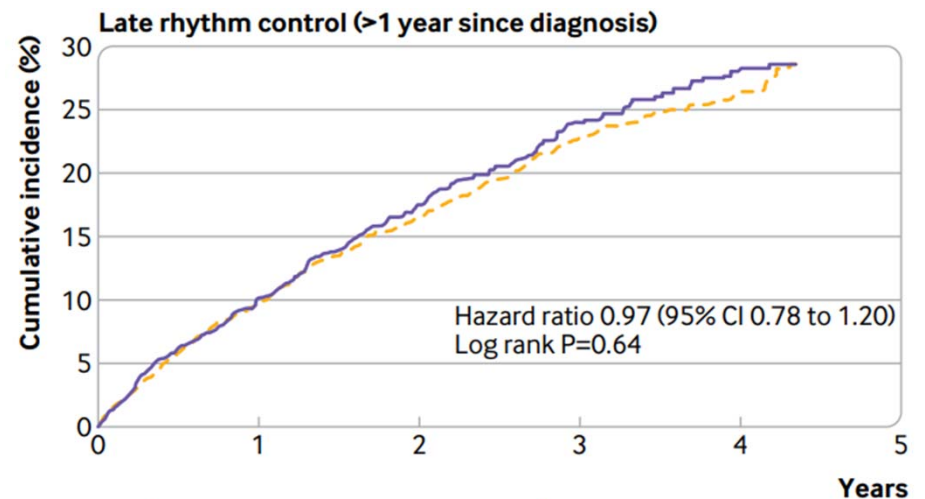
No at risk (weighted cumulative incidence)

Rate control

7077	5084	3248	1841	728
(0%)	(10.8%)	(17.5%)	(22.9%)	(27.8%)

Rhythm control

9246	6885	4361	2466	1033
(0%)	(8.3%)	(14.2%)	(19.3%)	(23.4%)



No at risk (weighted cumulative incidence)

Rate control

1905	1412	892	500	199
(0%)	(10.0%)	(17.5%)	(24.0%)	(28.0%)

Rhythm control

4407	3334	2177	1298	578
(0%)	(9.6%)	(16.5%)	(22.6%)	(26.3%)

Kim D, et al. *BMJ* 2021;373:n991.

KHRS 2023



Frailty in old age with AF

- Definition of frailty :
a condition in which the physiological system that copes with external stress weakens and becomes functionally vulnerable with increasing age.
- Clinical meaning of frailty on AF
 - significant impact on medical outcomes of the older population.
 - important factor in predicting older patients' potential for improvement after catheter ablation for AF.

Clegg A, et al. Lancet 2013;381:752-762.

Yang PS, et al. Circ J 2021;85:1305-1313.

Bahnon TD, et al. Circulation 2022;145:796-804.



Assessment of frailty on old age

109 ICD-10 codes contributing to calculating the Hospital Frailty Risk Score

ICD-10 Description	ICD-10 code	Points
Dementia in Alzheimer's disease	F00	7.1
Hemiplegia	G81	4.4
Alzheimer's disease	G30	4
Sequelae of cerebrovascular disease (secondary codes)	I69	3.7
Other symptoms and signs involving the nervous and musculoskeletal systems (R29.6 Tendency to fall)	R29	3.6
Other disorders of urinary system (includes urinary tract infection and urinary incontinence)	N39	3.2
Superficial injury of head	S00	3.2
Delirium, not induced by alcohol and other psychoactive substances	F05	3.2
Unspecified fall	W19	3.2
Unspecified hematuria	R31	3
Other bacterial agents as the cause of diseases classified to other chapters (secondary code)	B96	2.9
Other symptoms and signs involving cognitive functions and awareness	R41	2.7
Other cerebrovascular diseases	I67	2.6
Convulsions, not elsewhere classified	R56	2.6
Abnormalities of gait and mobility	R26	2.6
Somnolence, stupor and coma	R40	2.5
Intracranial injury	S06	2.4
Complications of genitourinary prosthetic devices, implants and grafts	T83	2.4
Other disorders of fluid, electrolyte and acid base balance	E87	2.3
Other joint disorders, not elsewhere classified	M25	2.3
Volume depletion	E86	2.3
Fracture of shoulder and upper arm	S42	2.3
Senility	R54	2.2



Divided into the 3 groups

- Non-frail (low-risk) (<5)
- Moderately-frail (5–15)
- Highly-frail (>15)

•
•
•

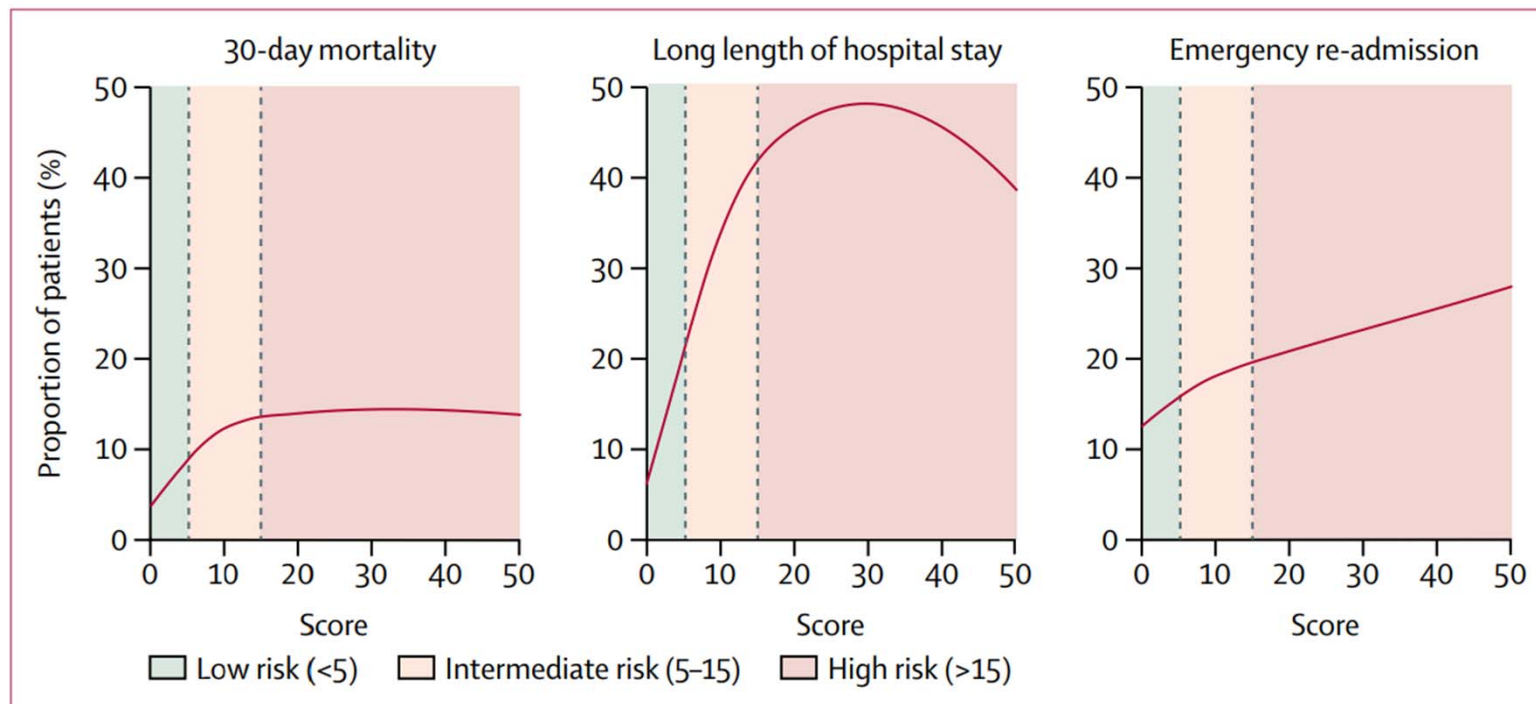
*Gilbert T, et al. Lancet 2018;391:1775-1782.
Eckart A, et al. BMJ Open 2019;9:e026923.*

KHRS 2023



Assessment of frailty on old age

Relation between Hospital Frailty Risk Scores and outcomes



Gilbert T, et al. Lancet 2018;391:1775-1782.

KHRS 2023



Impact of frailty on early rhythm control outcomes in older age with AF

- Rhythm-control therapy administered early following the initial diagnosis of AF has superior cardiovascular outcomes compared to rate-control therapy.
- Frailty is a key factor in identifying older patients' potential for improvement after rhythm-control therapy.
- Evaluated whether frailty affects the outcome of early rhythm-control therapy in older patients with AF.

Kirchhof P, et al. N Engl J Med . 2020;383:1305–1316.

Kim D, et al. BMJ 2021;373:n991.

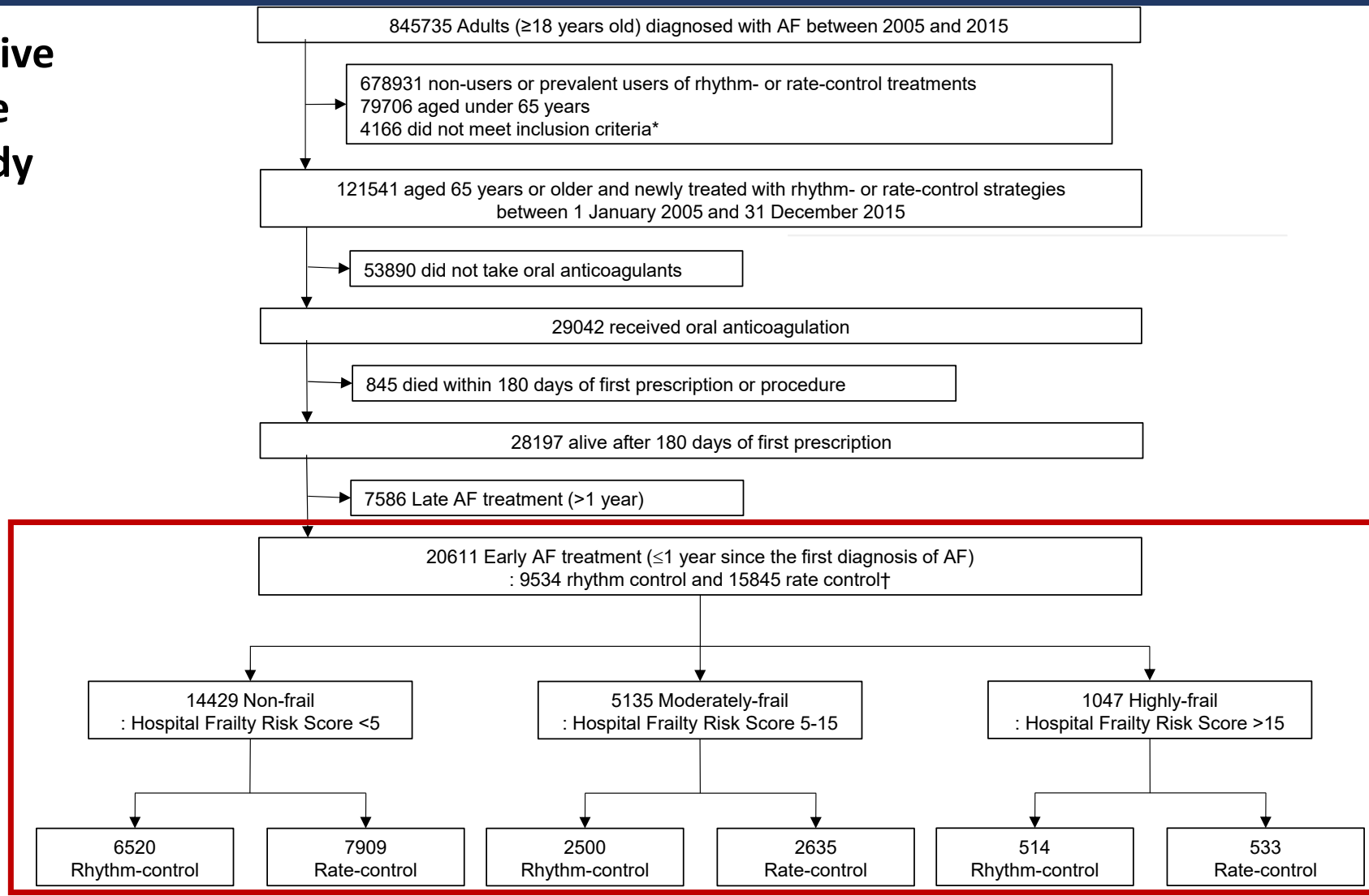
Clegg A, et al. Lancet 2013;381:752-762.

Yang PS, et al. Circ J 2021;85:1305-1313.

Bahnson TD, et al. Circulation 2022;145:796-804.



Retrospective nationwide cohort study



Yu GI, et al. *Front Cardiovasc Med* 2022;9:1050744.

KHRS 2023



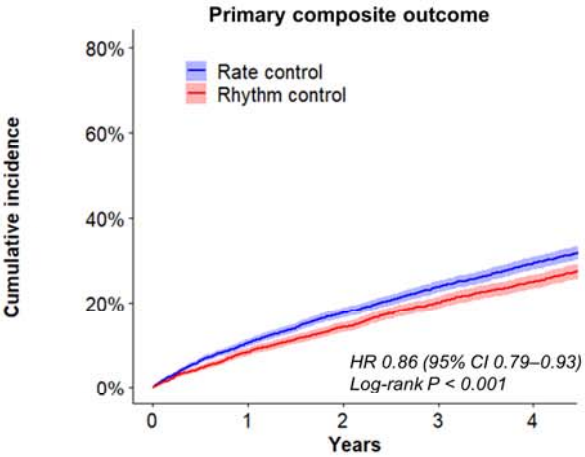
Impact of frailty on early rhythm control outcomes in older age with AF

Clinical outcomes in patients recently diagnosed with AF (within 1 year)

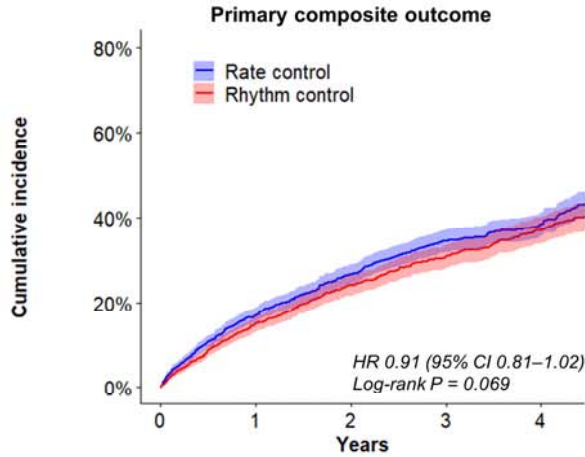
Primary composite outcomes:

cardiovascular-related mortality, myocardial infarction, hospitalization for heart failure, and ischemic stroke.

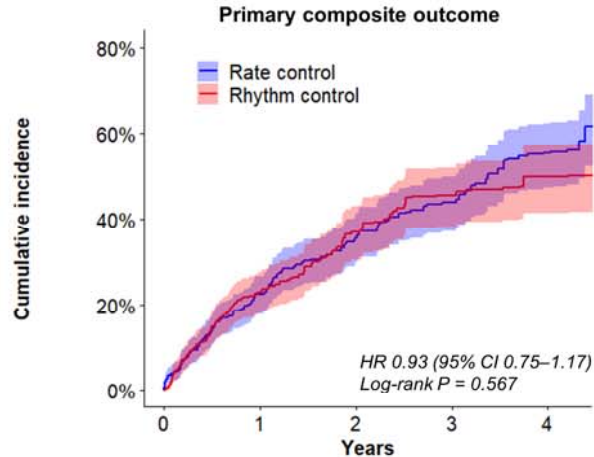
(A) Non-frail



(B) Moderately-frail



(C) Highly-frail



Crude/weighted number at risk (weighted cumulative incidence, %)

	7909/2165	6303/1711	4968/1303	3888/986	3042/747
Rate control	(0.0)	(10.4)	(17.6)	(23.7)	(29.3)
Rhythm control	6520/2165	5323/1757	4056/1354	3047/1040	2279/798
	(0.0)	(9.2)	(14.2)	(19.9)	(24.8)

Crude/weighted number at risk (weighted cumulative incidence, %)

	2635/848	1837/584	1266/392	833/259	639/185
Rate control	(0.0)	(17.0)	(26.7)	(34.4)	(38.4)
Rhythm control	2500/848	1774/600	1180/405	797/276	544/190
	(0.0)	(15.0)	(24.1)	(30.8)	(37.0)

Crude/weighted number at risk (weighted cumulative incidence, %)

	533/177	304/106	176/61	111/37	64/19
Rate control	(0.0)	(22.4)	(35.7)	(43.9)	(55.4)
Rhythm control	514/177	292/100	157/55	98/34	49/19
	(0.0)	(23.1)	(37.1)	(45.5)	(49.9)

Yu GI, et al. Front Cardiovasc Med 2022;9:1050744.

KHRS 2023



Summary

- Rhythm-control therapy administered early following the initial diagnosis of AF has superior cardiovascular outcomes compared to rate-control therapy.
- Frailty is a key factor in identifying older patients' potential for improvement after rhythm-control therapy.
- Although the degree attenuated with increasing frailty, the superiority of cardiovascular outcomes of early rhythm-control in AF treatment was maintained without increased risk for safety outcomes.



THANK YOU



KHRS 2023