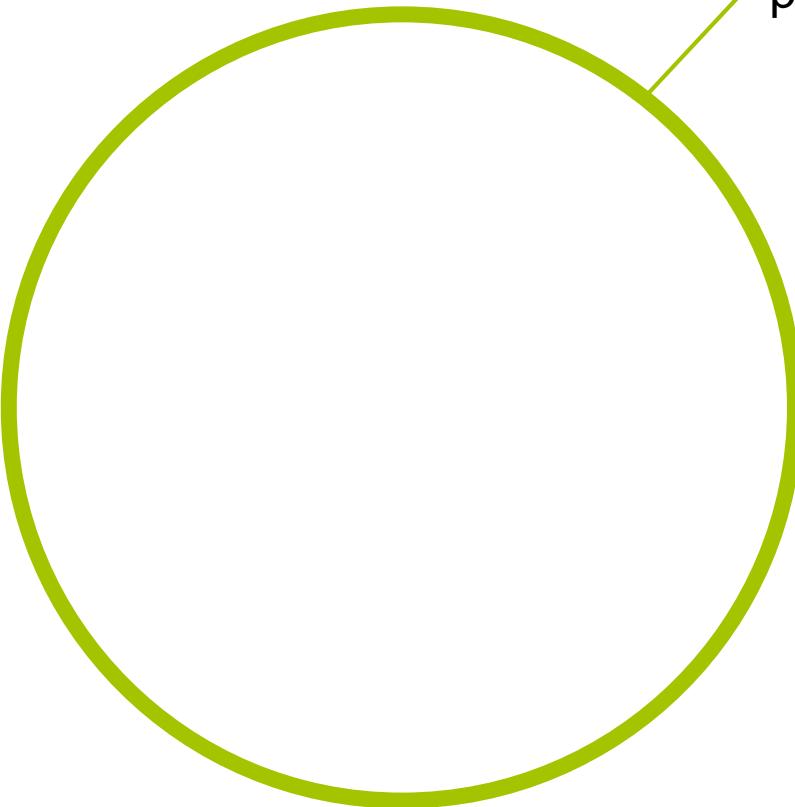




Kantonsspital
St.Gallen

Update Vorhofflimmern

Florian Franzeck



Vorhofflimmern-
population

Behandlungsziel?

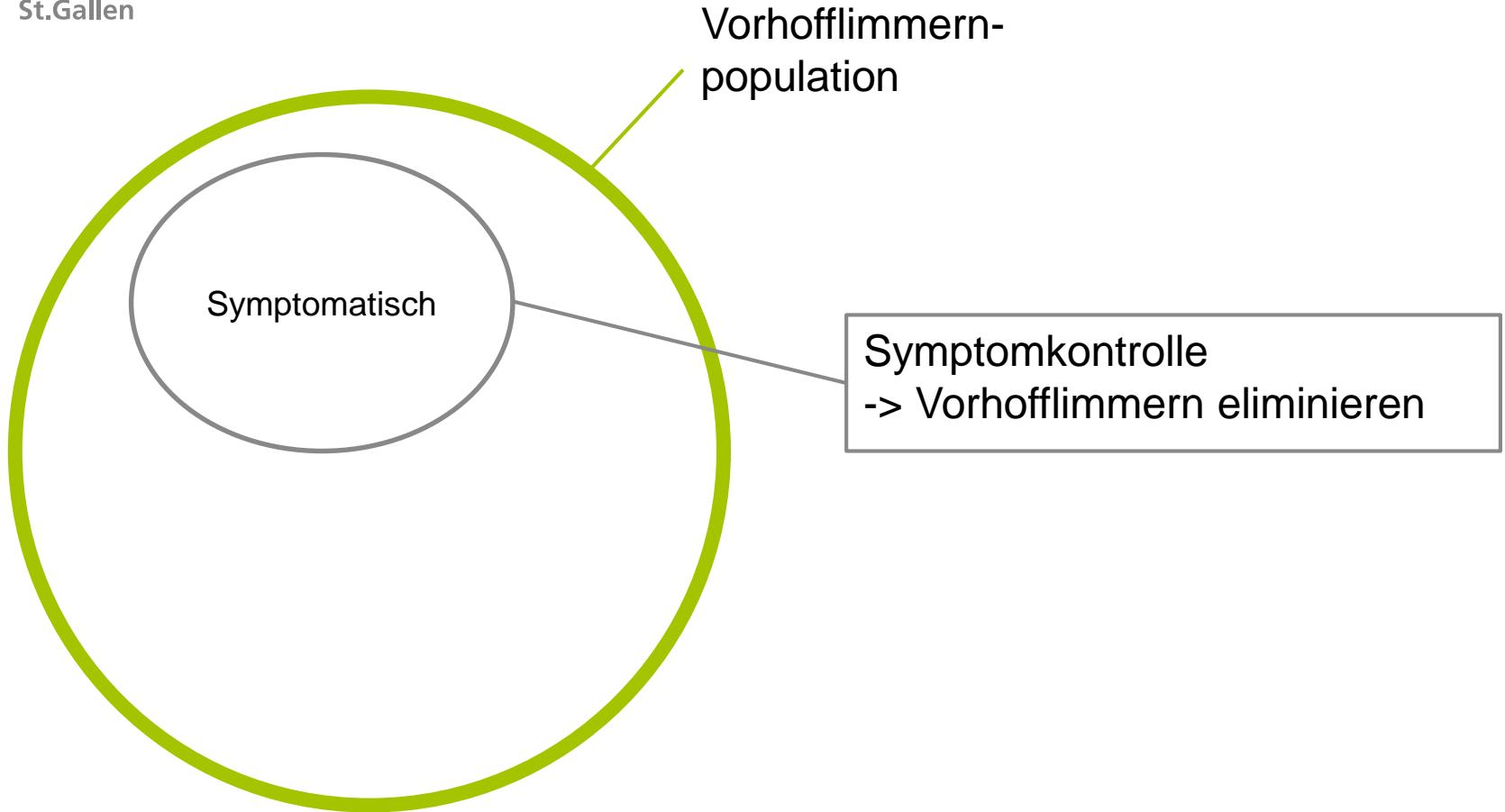
- Symptomkontrolle
- Prognose verbessern

Bei welchen Patienten?

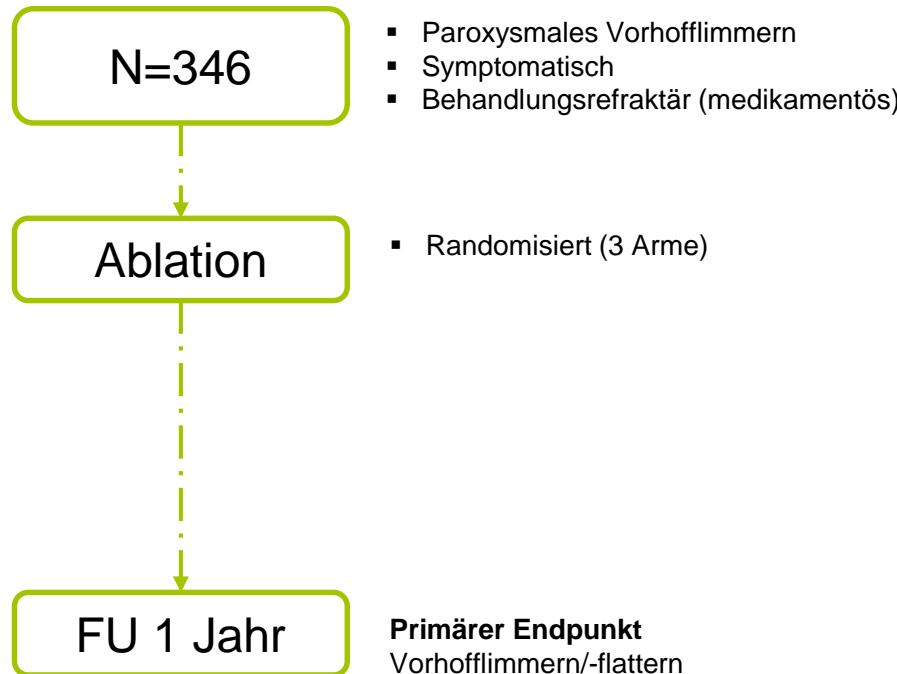
- Paroxysmale
- Persistierende
- Herzinsuffizienz

Womit?

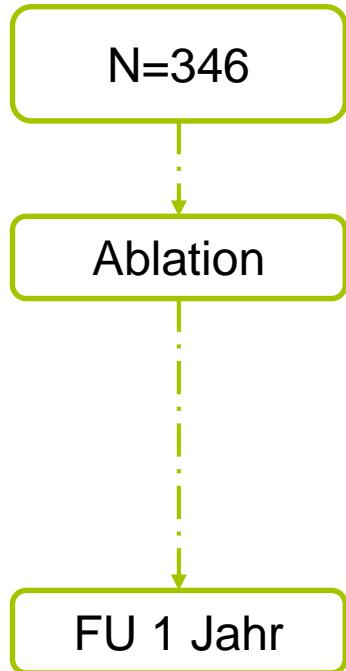
- Medikamentös
- Ablation? Technologie?



CIRCA-DOSE Studie



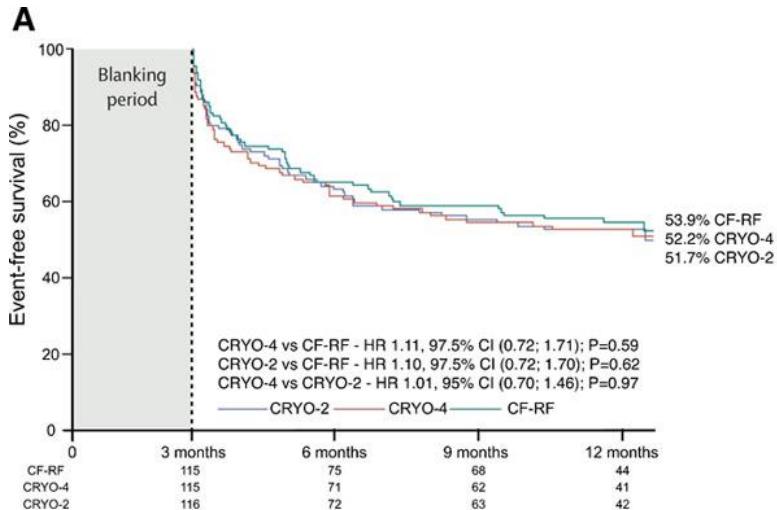
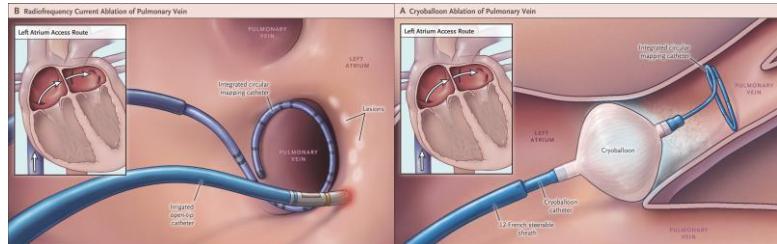
CIRCA-DOSE Studie



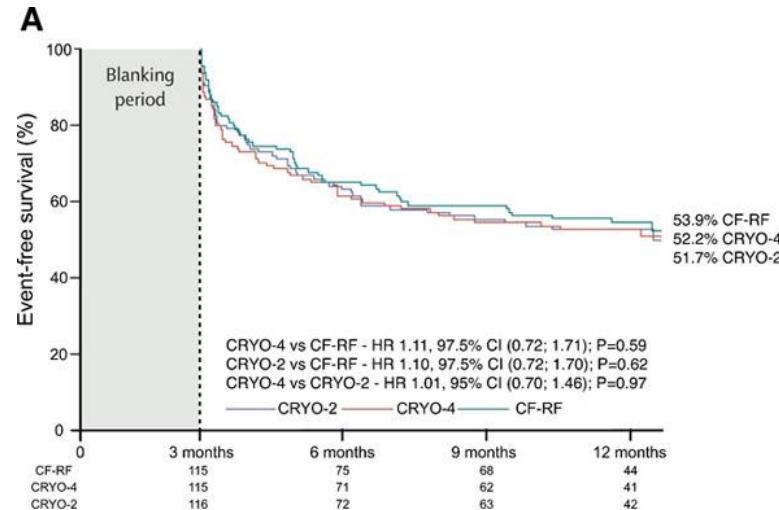
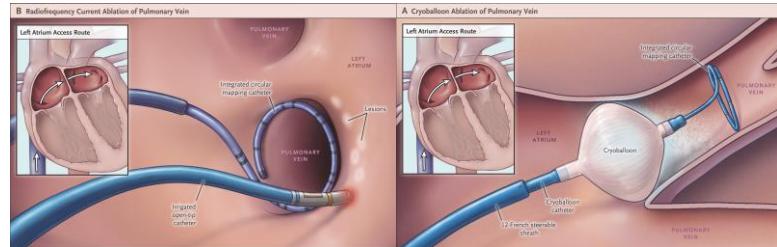
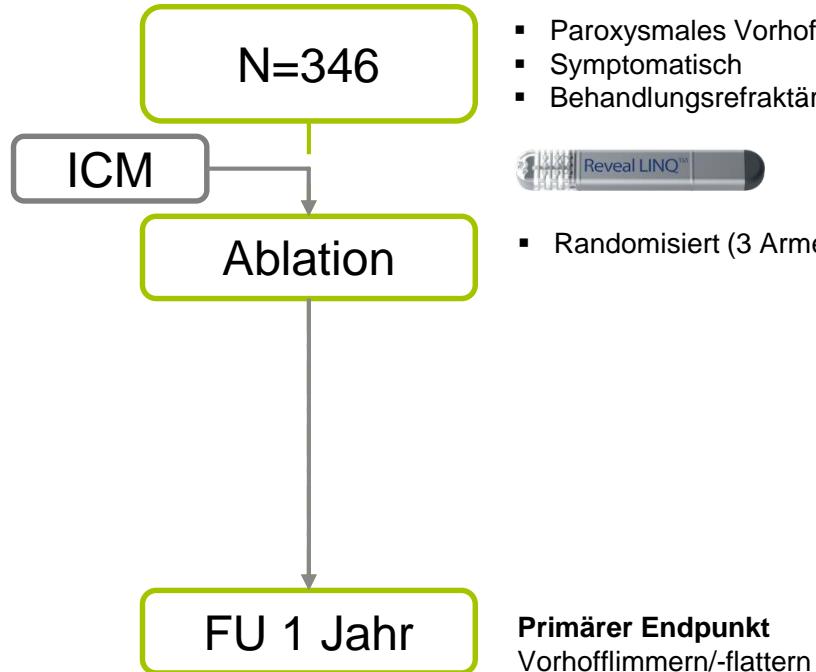
- Paroxysmales Vorhofflimmern
- Symptomatisch
- Behandlungsrefraktär (medikamentös)

- Randomisiert (3 Arme)

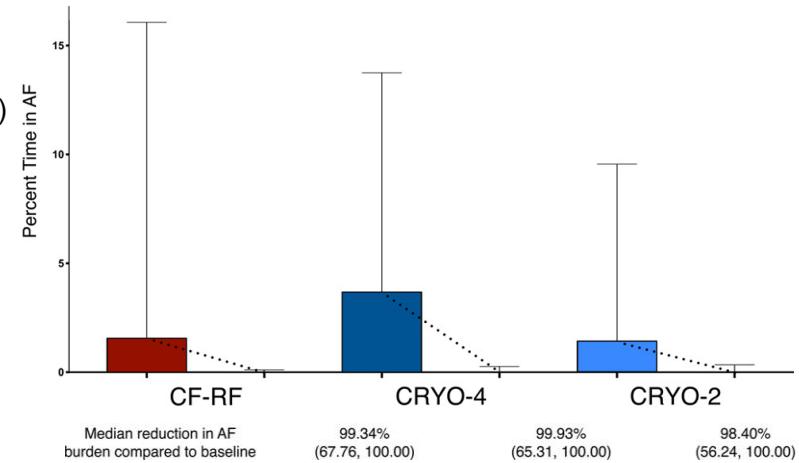
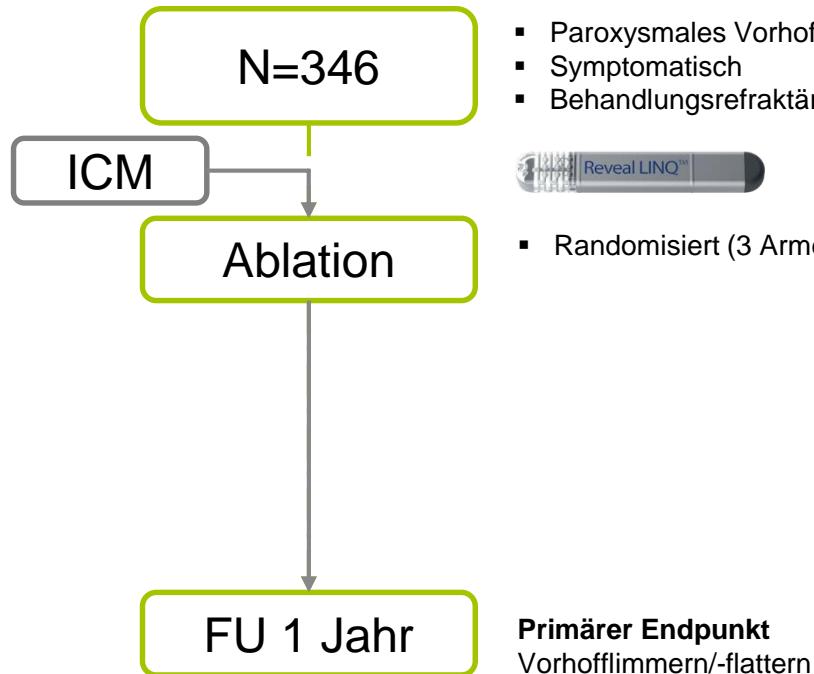
Primärer Endpunkt
Vorhofflimmern/-flattern



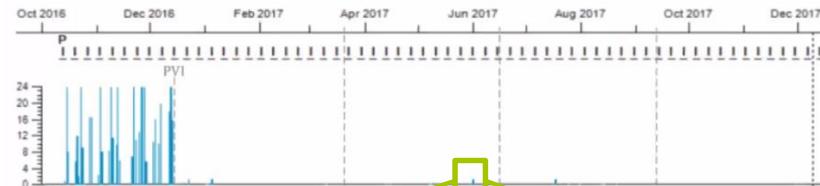
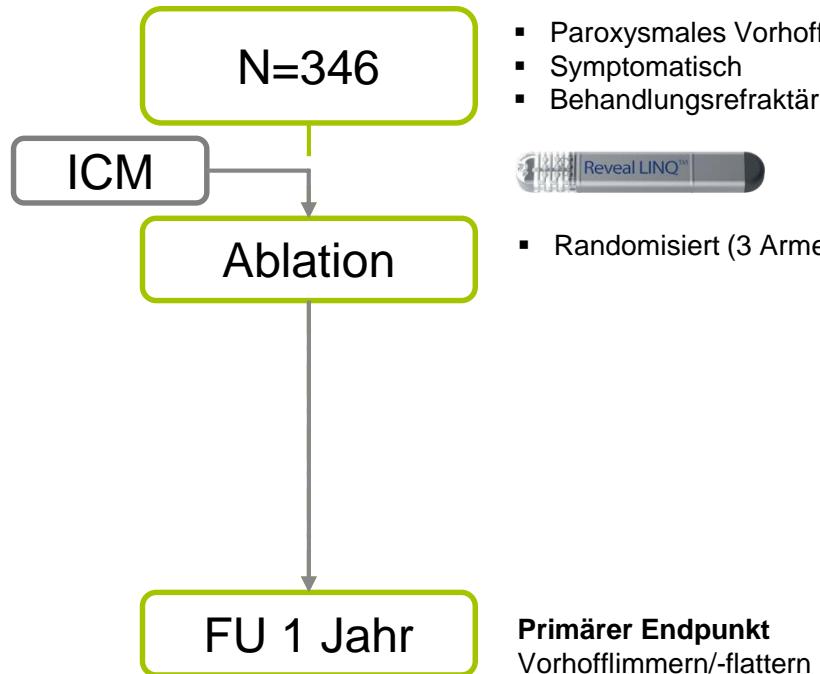
CIRCA-DOSE Studie



CIRCA-DOSE Studie



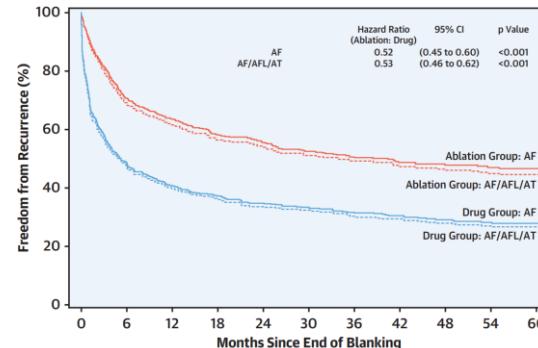
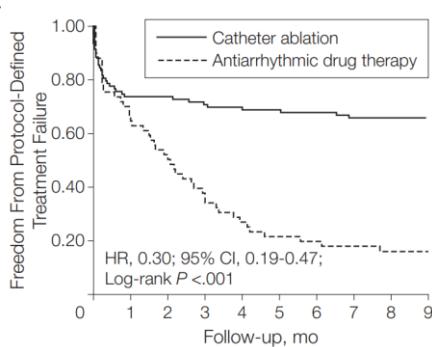
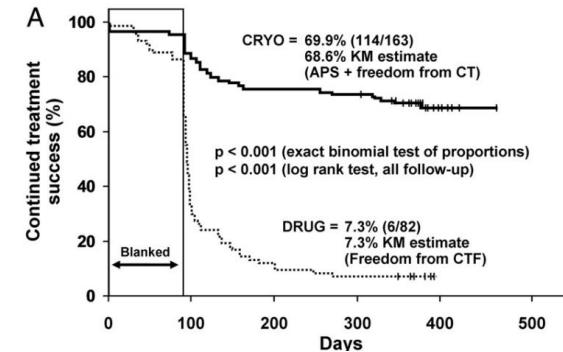
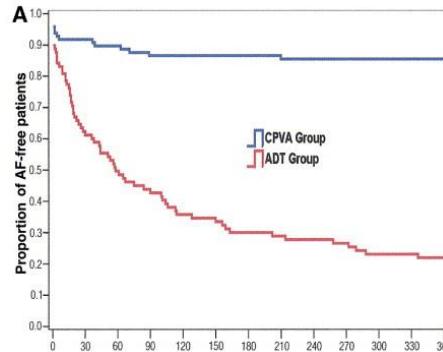
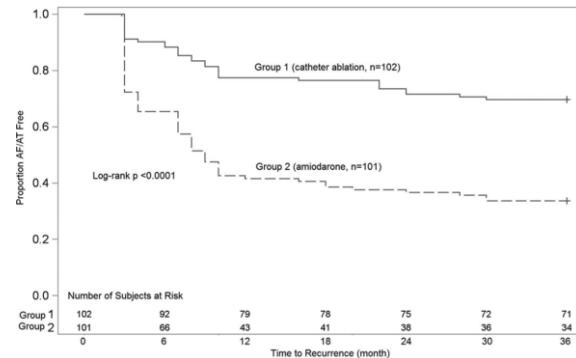
CIRCA-DOSE Studie



VS.

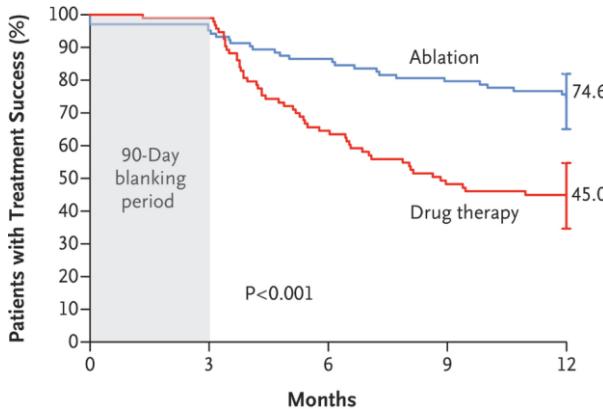
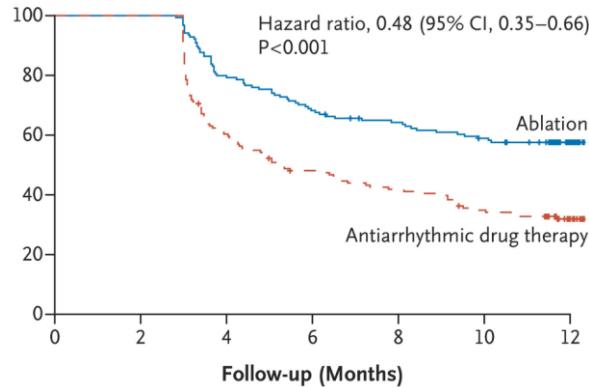
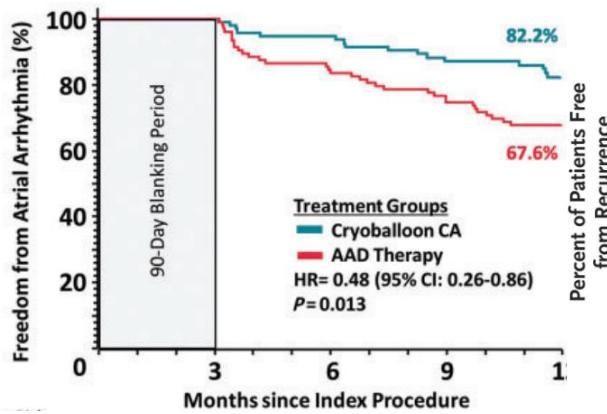


PVI als Primärtherapie?



PVI als Primärtherapie?

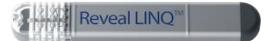
- Paroxysmales Vorhofflimmern
- Hochsymptomatisch
- Randomisation AAD vs. PVI als Ersttherapie
- Unverblindet: KEINE Shamprozedur
- Total N=724, 57y
- Wenig Komorbiditäten



CRYO First 2021



EARLY AF 2021



STOP AF First 2021



PVI als Primärtherapie?

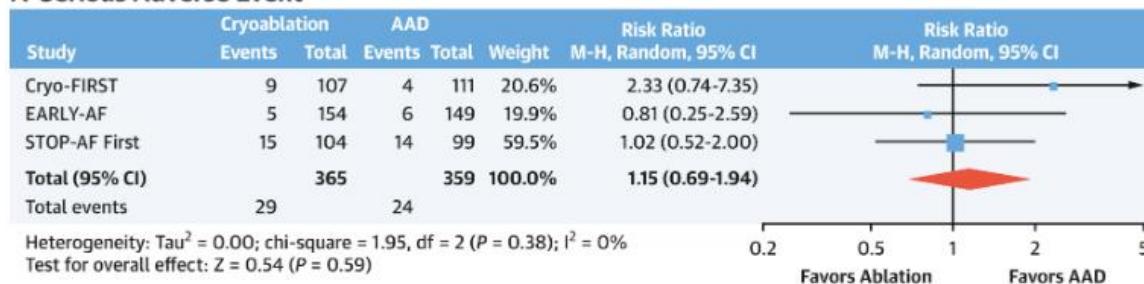
Ablationsarm

3x Phrenicusparese
2x DDD-PM

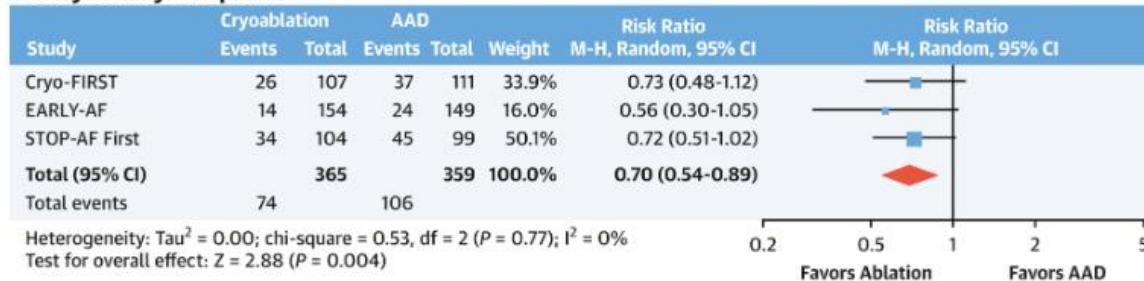
AAD

1x TIA
1x Tamponade
2x WCT (Flecainid/Sotalol)
2x DDD-PM
1x Synkope (ACS mit VT; Flecainid)
1x akute Herzinsuffizienz (Flecainid)

A Serious Adverse Event



B Any Safety Endpoint



CRYO First 2021



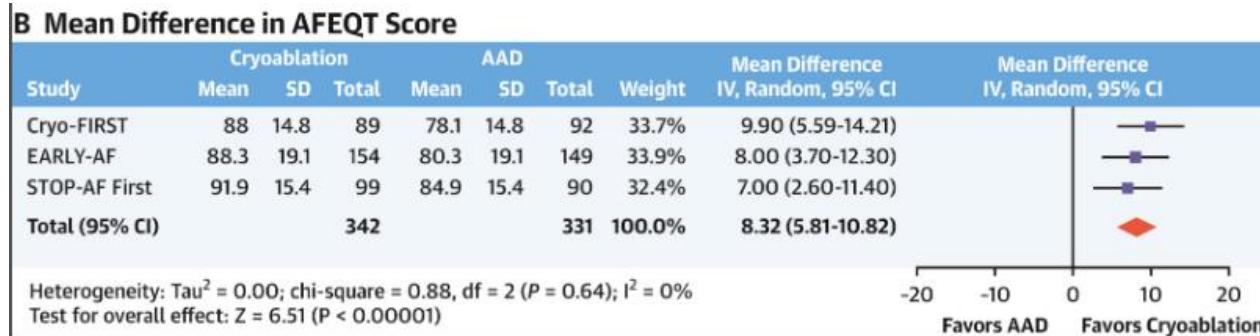
EARLY AF 2021



STOP AF First 2021



PVI als Primärtherapie?



CRYO First 2021

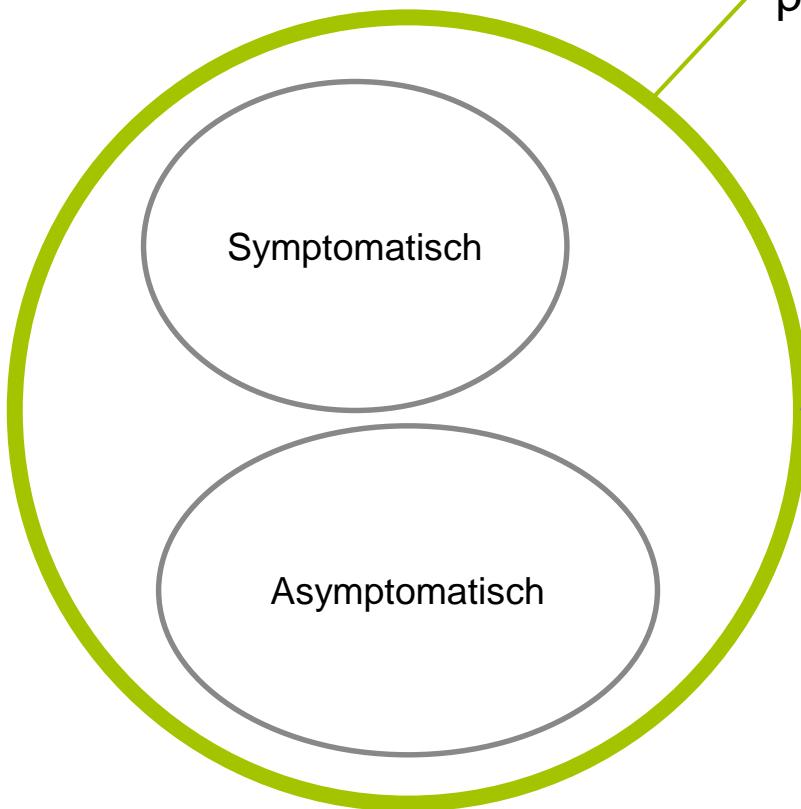


EARLY AF 2021



STOP AF First 2021

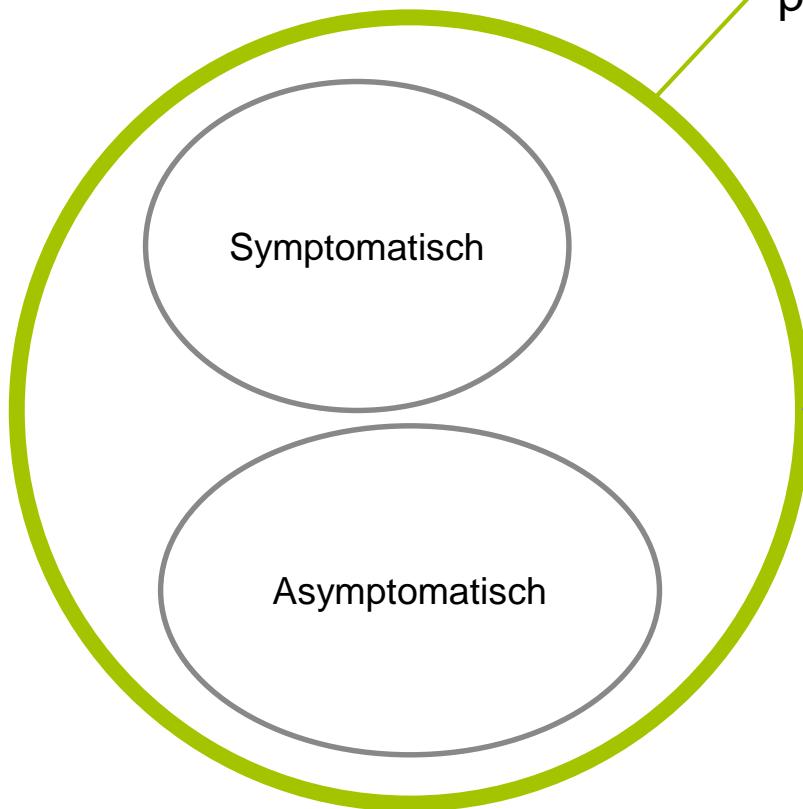




Vorhofflimmern-
population

Prognoseverbesserung

- Mortalität
- Herzinsuffizienz
- Thromboembolien
- Progression Vorhofflimmern

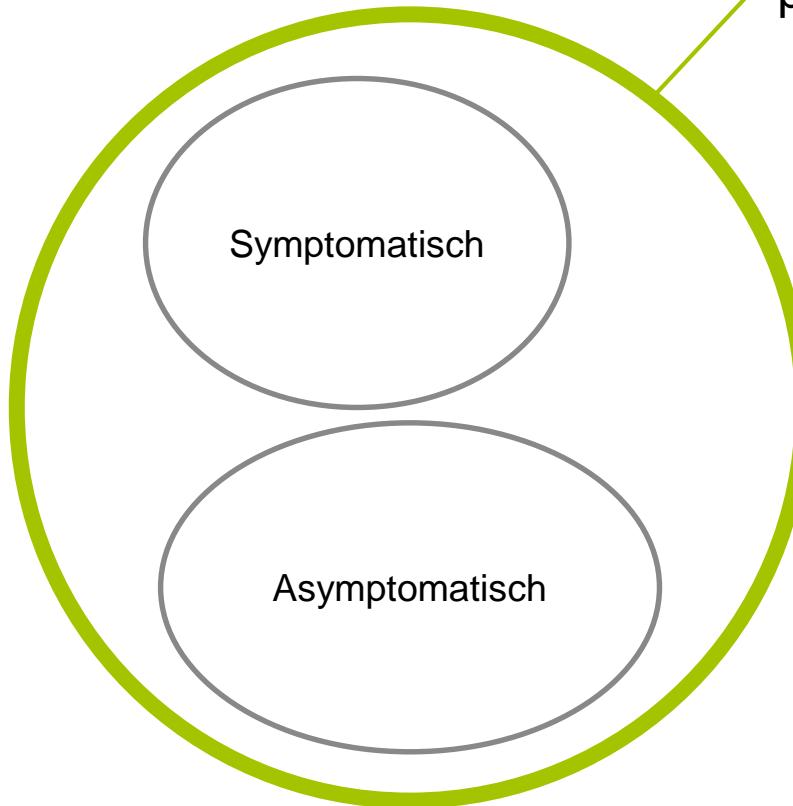


Vorhofflimmern- population

Prognoseverbesserung

- Mortalität
- Herzinsuffizienz
- Thromboembolien
- Progression Vorhofflimmern

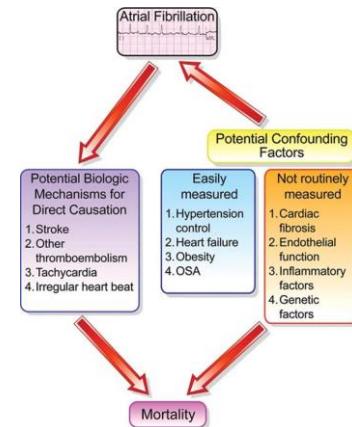
Study	Cohort	Adjusted relative risk of death (95% CI)		
Andersson ¹	272 186 incident AF	<65 years:	65–74 years:	75–85 years:
	vs. 544 344 controls	F 2.15 (1.99–2.32)	F 1.72 (1.67–1.78)	F 1.44 (1.42–1.46)
		M 1.76 (1.69–1.84)	M 1.36 (1.33–1.40)	M 1.24 (1.22–1.26)

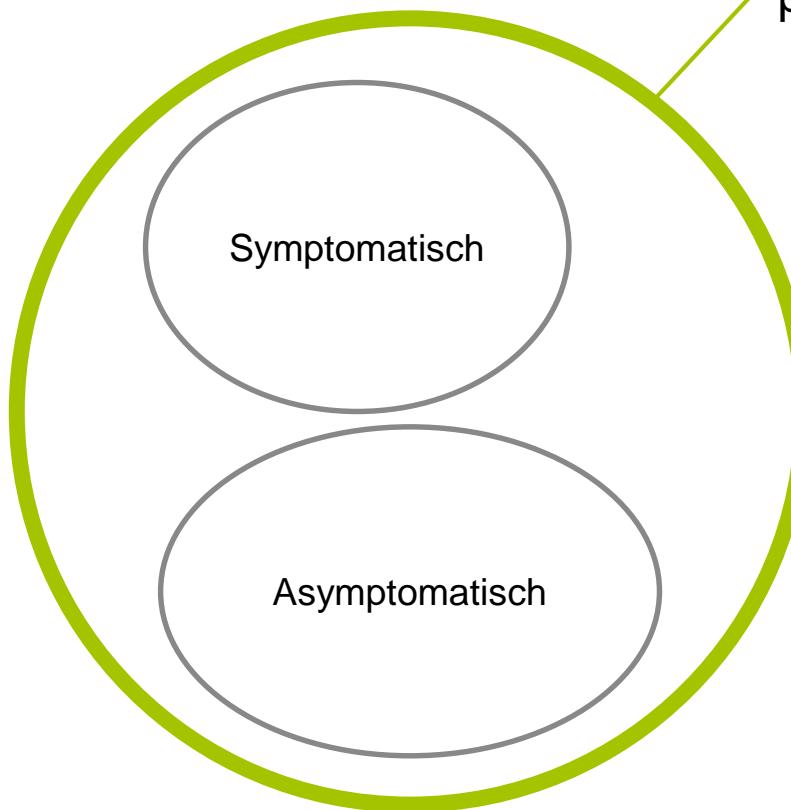


Vorhofflimmern- population

Prognoseverbesserung

- Mortalität
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- Thromboembolien
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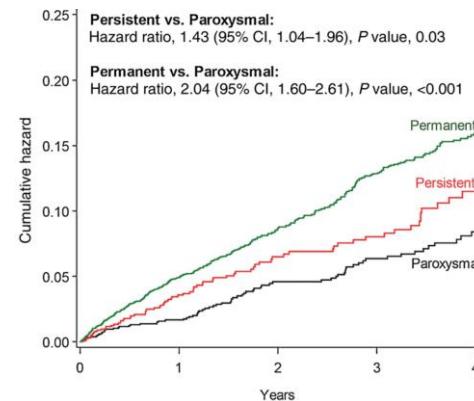


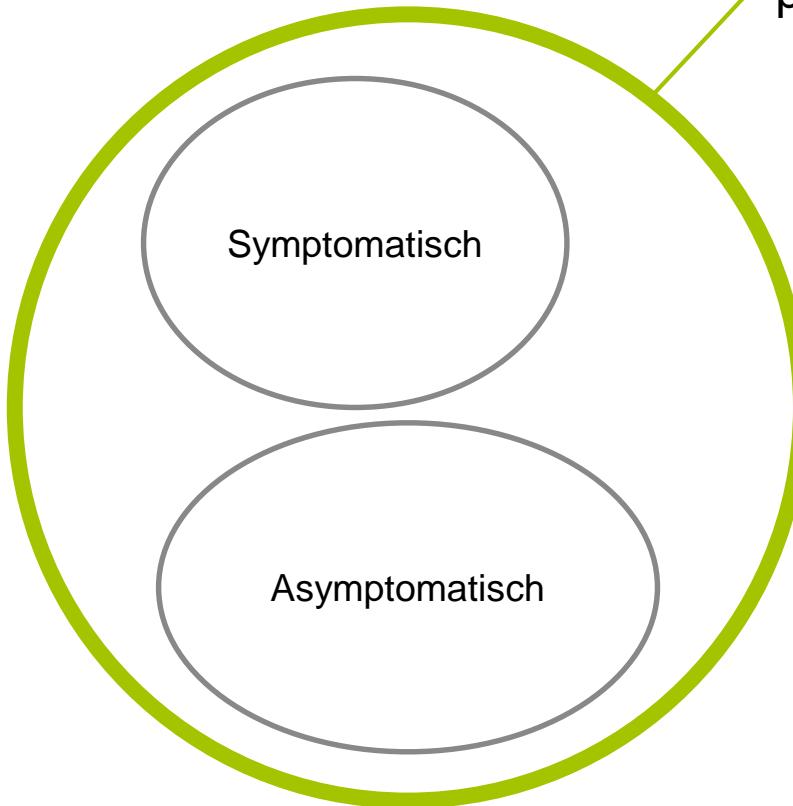


Vorhofflimmern- population

Prognoseverbesserung

- Mortalität
- Herzinsuffizienz
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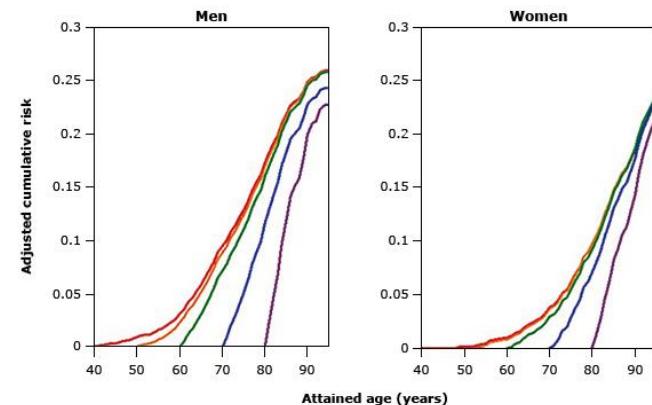




Vorhofflimmern-population

Prognoseverbesserung

- Mortalität
- Herzinsuffizienz
- Thromboembolien
- Progression Vorhofflimmern



CABANA Studie

N=2204

- Paroxysmal/persistierend
- Symptomatisch
- Open label
- 126 Zentren
- Einschluss 2009-2016

Ablation

Drugs

1° Endpunkt

Tod
Stroke
Blutung
Cardiac Arrest

CABANA Studie

N=2204

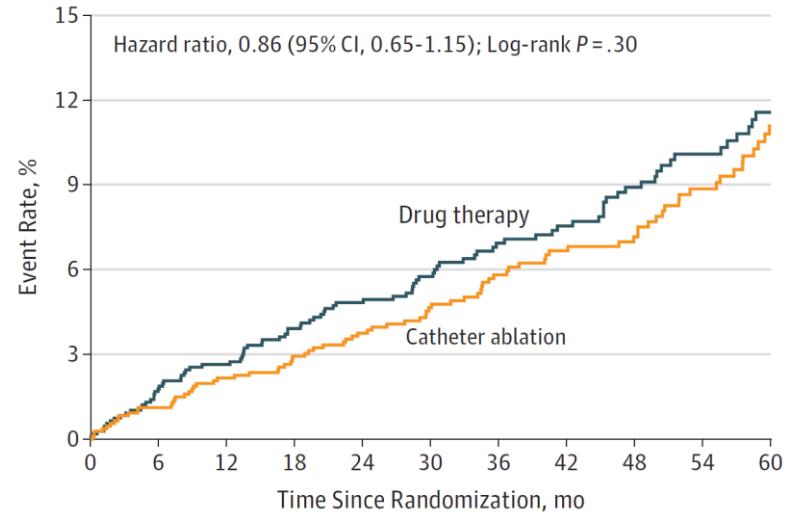
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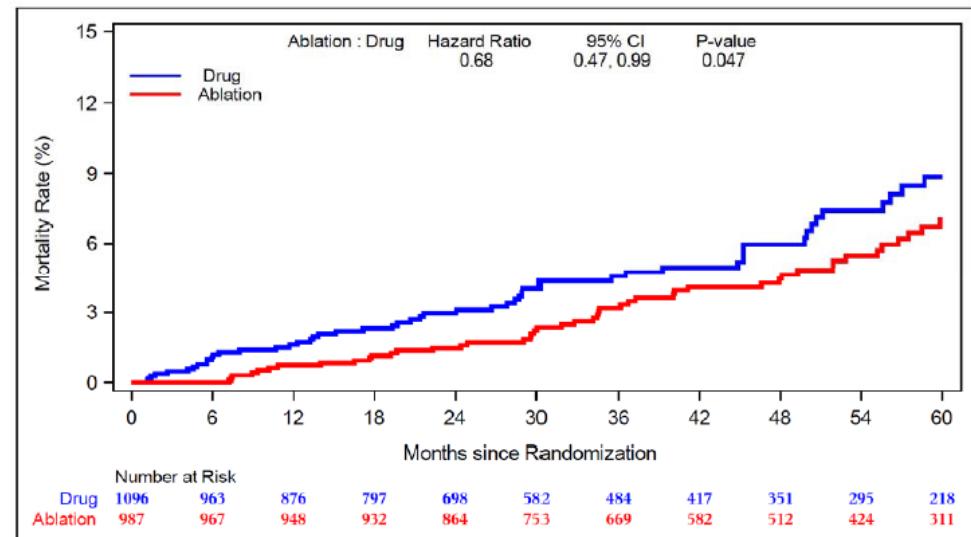
Drugs

28% Drugs->Ablation

9% Ablation -> Drugs

1° Endpunkt

Tod
 Stroke
 Blutung
 Cardiac Arrest



Per protocol, Mortalität

EAST AFNET 4 Studie

N=2789

- 26% persistierend, Ø 36d seit ED
- 30% asymptomatisch
- Ø 70y
- Ø CHADS-Vasc 3 Punkte

Rhythmuskontrolle

Frequenzkontrolle

1° Endpunkt

Tod

Stroke

Hospitalisation (Herzinsuffizienz)

Akutes Koronarsyndrom

EAST AFNET 4 Studie

N=2789

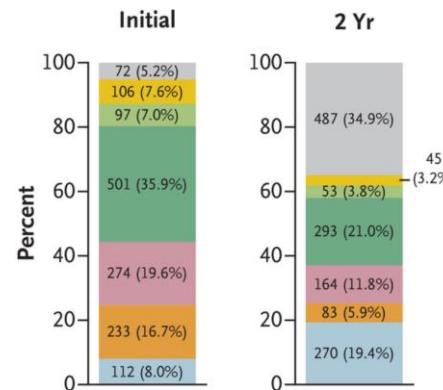
- 26% persistierend, Ø 36d seit ED
- 30% asymptomatisch
- Ø 70y
- Ø CHADS-Vasc 3 Punkte
- Rigorose Rhythmuskontrolle, enger F/U

Rhythmuskontrolle

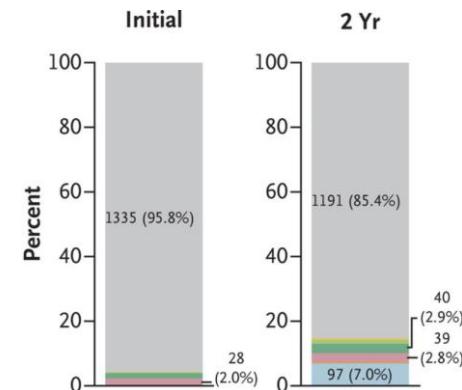
Frequenzkontrolle

1° Endpunkt

Tod
Stroke
Hospitalisation (Herzinsuffizienz)
Akutes Koronarsyndrom



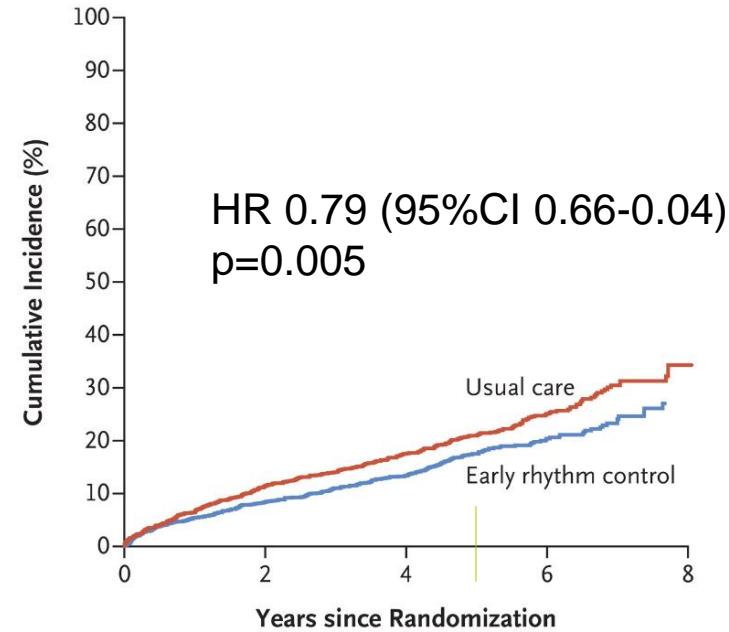
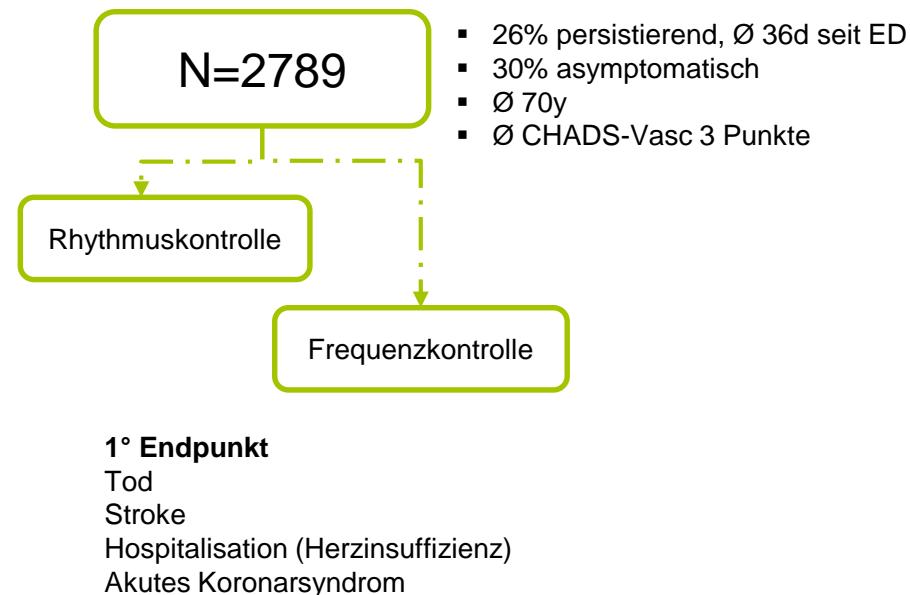
Rhythmuskontrolle



Frequenzkontrolle



EAST AFNET 4 Studie



EAST AFNET 4 Studie

N=2789

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- Ø 70y
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Rhythmuskontrolle

Frequenzkontrolle

1° Endpunkt

Tod
Stroke
Hospitalisation (Herzinsuffizienz)
Akutes Koronarsyndrom

Tod	HR 0.72	(95%CI 0.52-0.98)
Stroke	HR 0.65	(95%CI 0.44-0.97)
Hosp. (HF)	HR 0.81	(95%CI 0.65-1.02)
ACS	HR 0.83	(95%CI 0.58-1.19)

Safety 16.6% vs. 16.0%

EAST AFNET 4 Studie

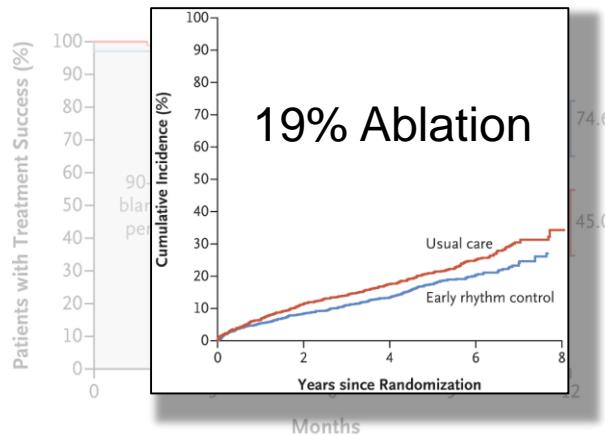
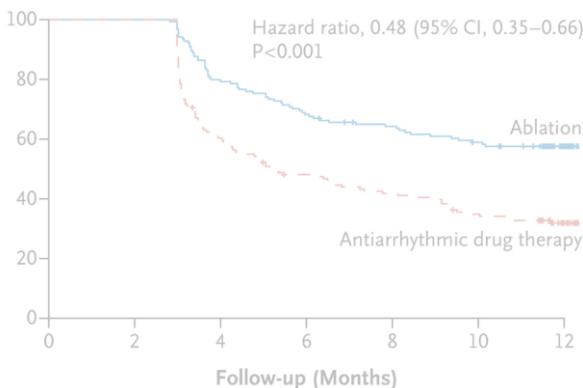
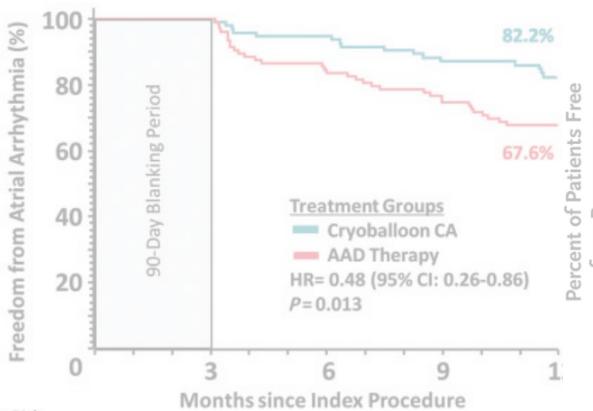
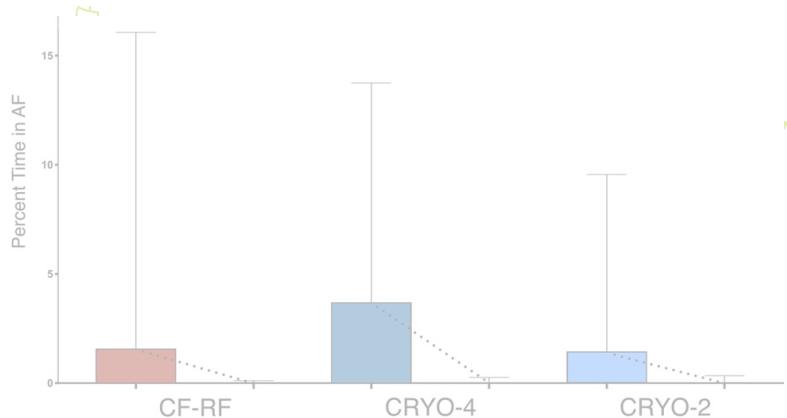
N=2789

Rhythmuskontrolle

Frequenzkontrolle

Worstellinientherapie?

Total N=724, 57y
Wenig Komorbiditäten



CRYO First 2021

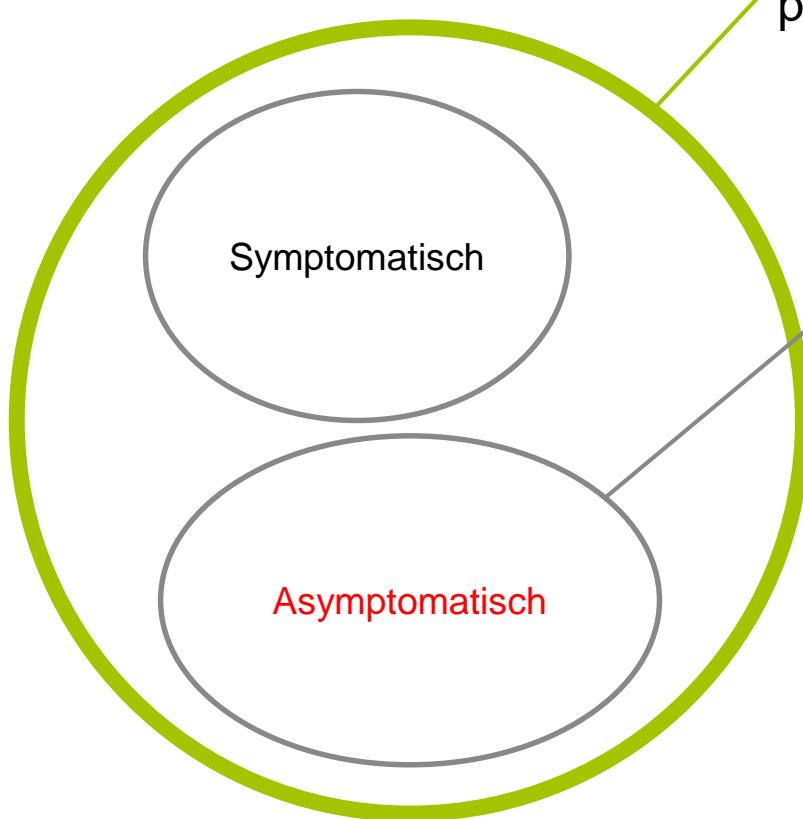


EARLY AF 2021



STOP AF First 2021

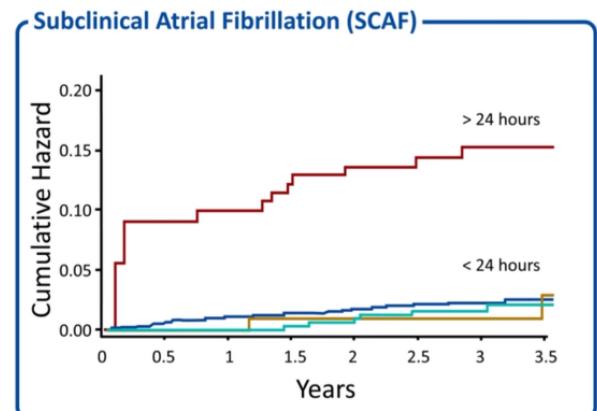




Vorhofflimmern- population

Prognoseverbesserung

- Mortalität
- Herzinsuffizienz
- Thromboembolien
- Progression Vorhofflimmern



EAST AFNET 4 Studie

N=2789

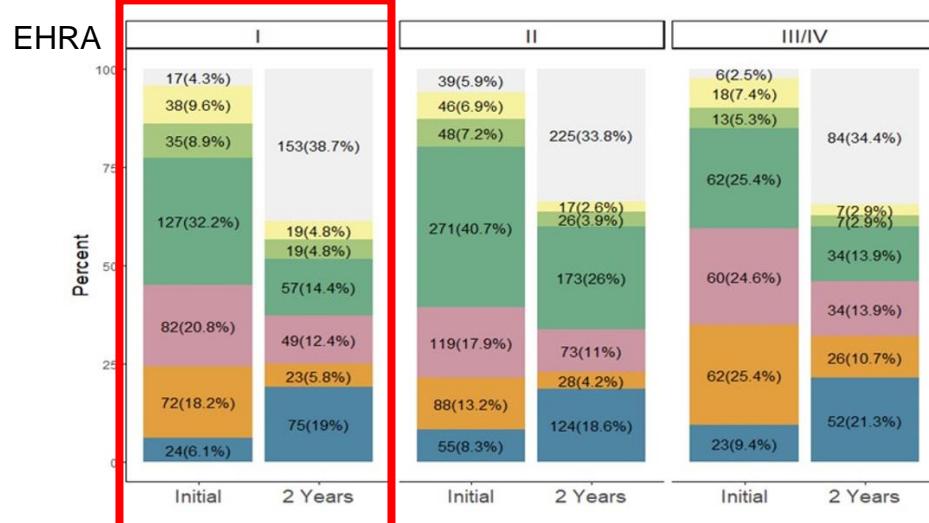
- 26% persistierend, Ø 36d seit ED
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- Ø 70y
- Ø CHADS-Vasc 3 Punkte

Rhythmuskontrolle

Frequenzkontrolle

1° Endpunkt

Tod
Stroke
Hospitalisation (Herzinsuffizienz)
Akutes Koronarsyndrom



EAST AFNET 4 Studie

N=2789

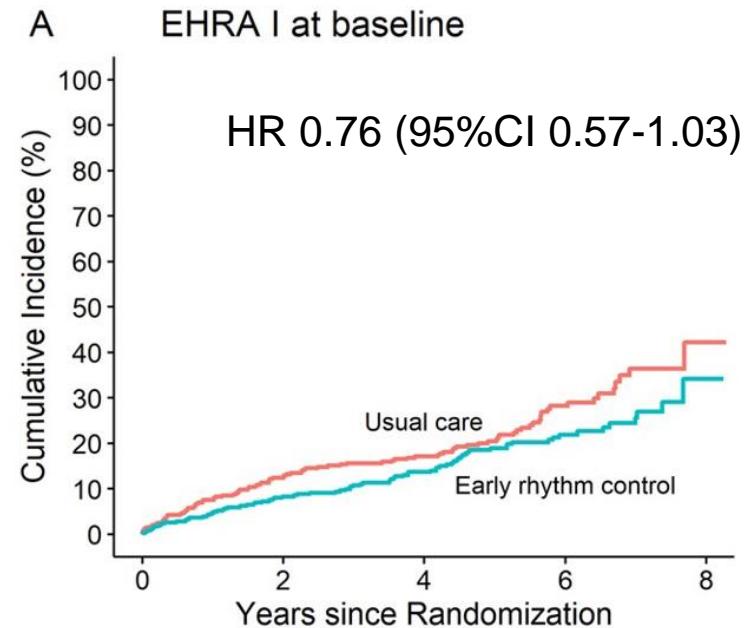
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Rhythmuskontrolle

Frequenzkontrolle

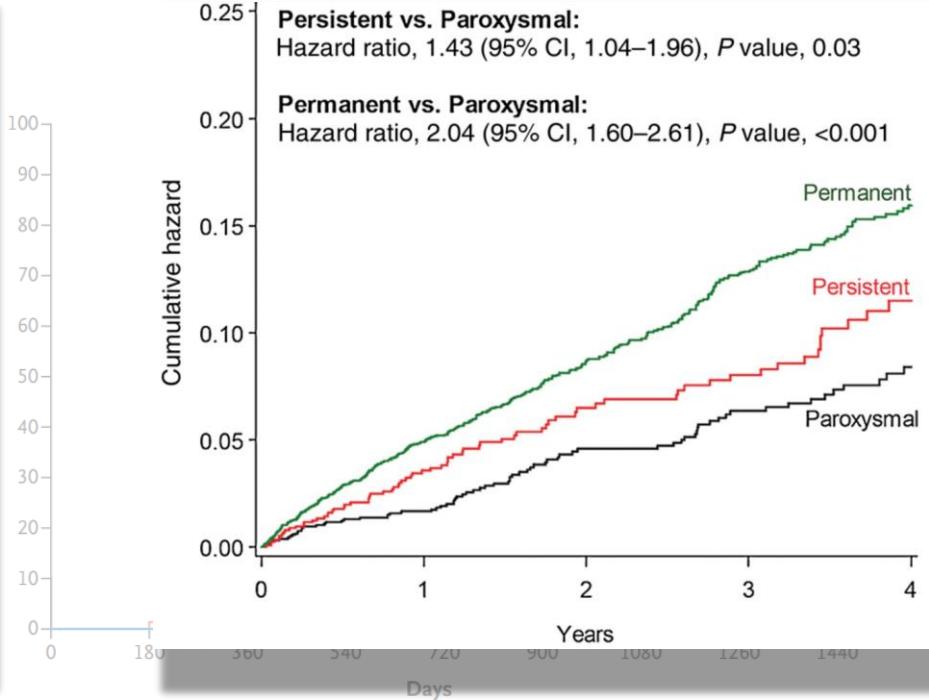
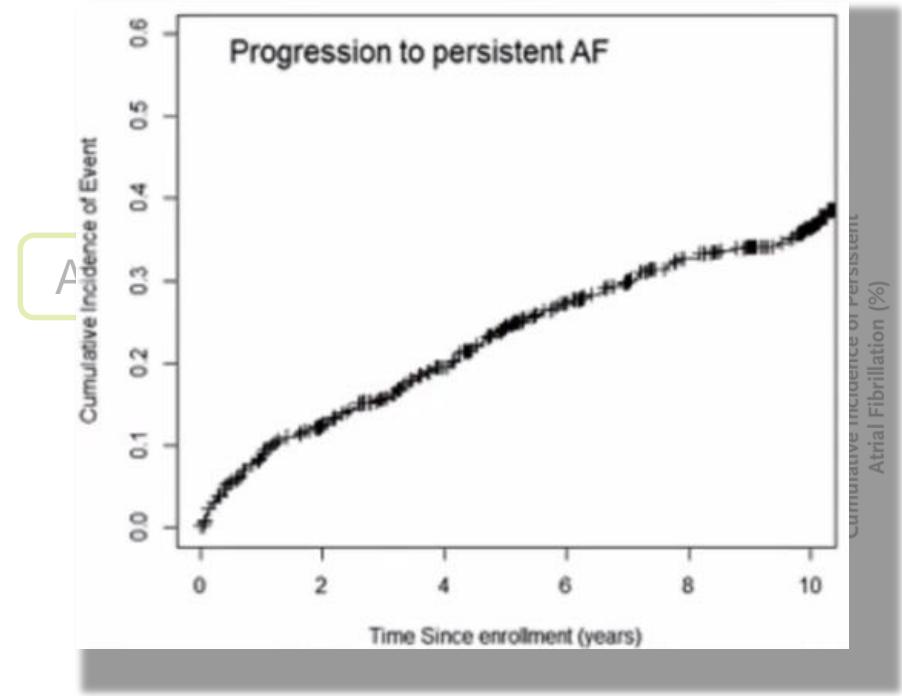
1° Endpunkt

Tod
Stroke
Hospitalisation (Herzinsuffizienz)
Akutes Koronarsyndrom



Progression zu persistierendem Vorhofflimmern

EARLY-AF Progression Studie



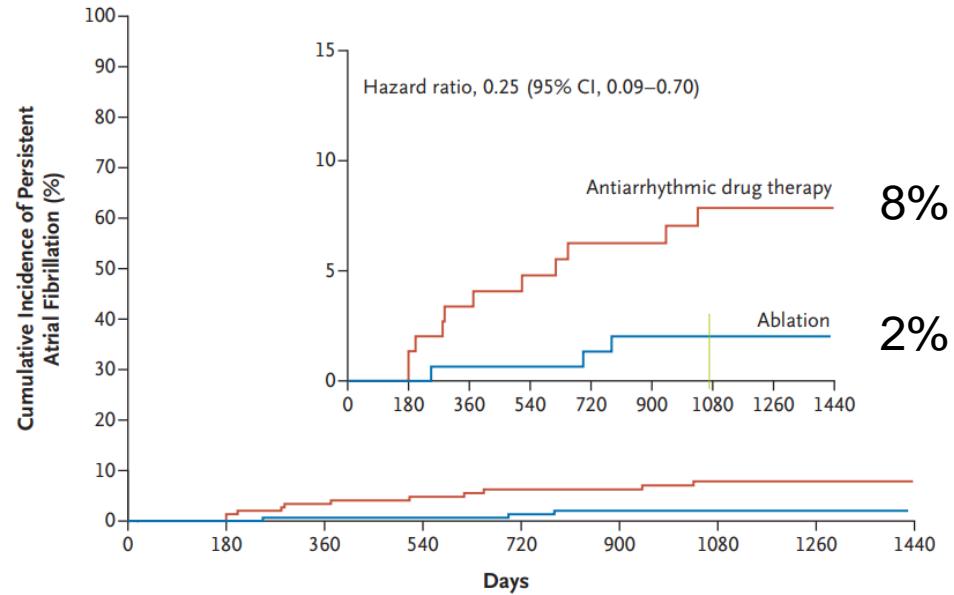
EARLY-AF Progression Studie

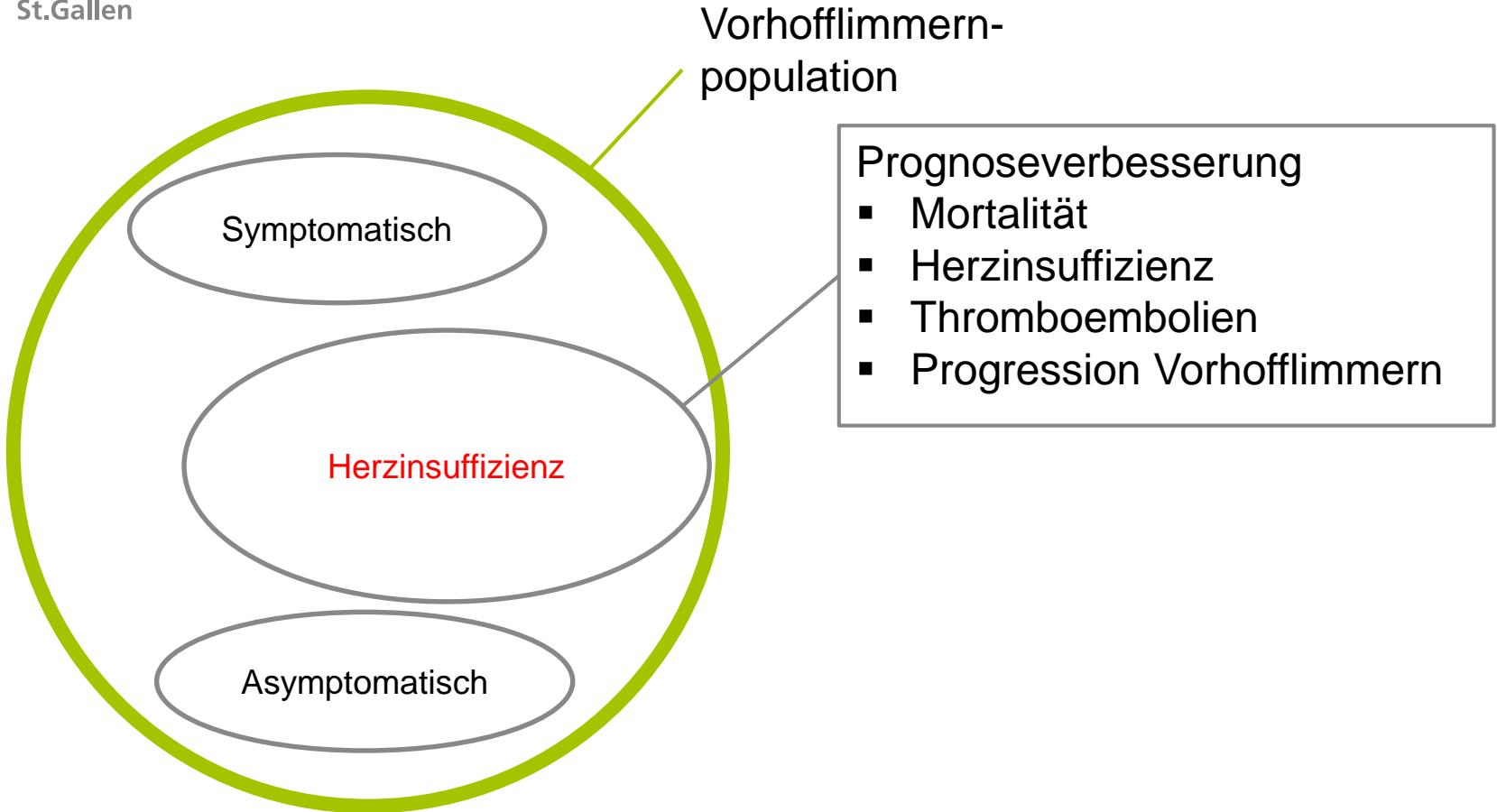
N=303

- Paroxysmal
- Symptomatisch
- Open label
- Implantierbarer Looprekorder

Ablation

Drugs





CASTLE-AF

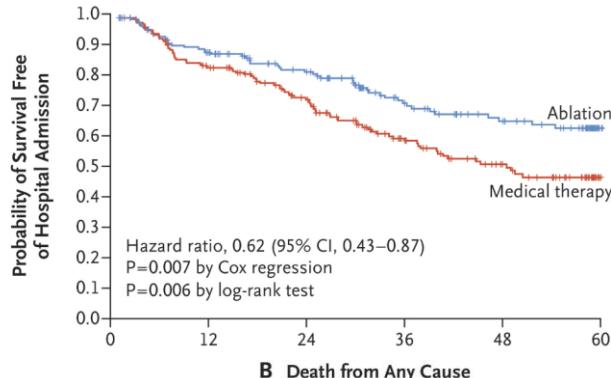
N=398

- 65% persistierend
- NYHA II-IV, LVEF $\leq 35\%$
- 40% bisher keine AAD
- DDD ICD/CRT

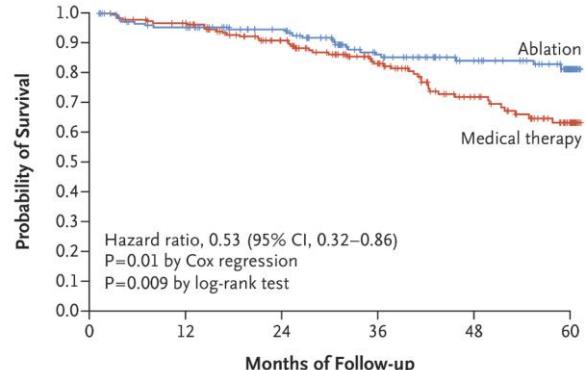
Ablation

Drugs

A Death or Hospitalization for Worsening Heart Failure



B Death from Any Cause



CABANA Studie

N=2204

- Paroxysmal/persistierend
- Symptomatisch
- Open label
- 126 Zentren
- Einschluss 2009-2016

Ablation

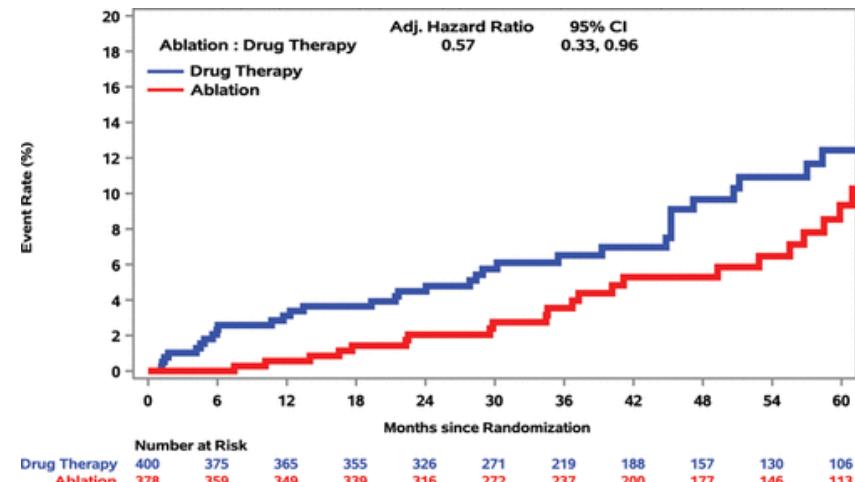
Drugs

28% Drugs->Ablation

9% Ablation -> Drugs

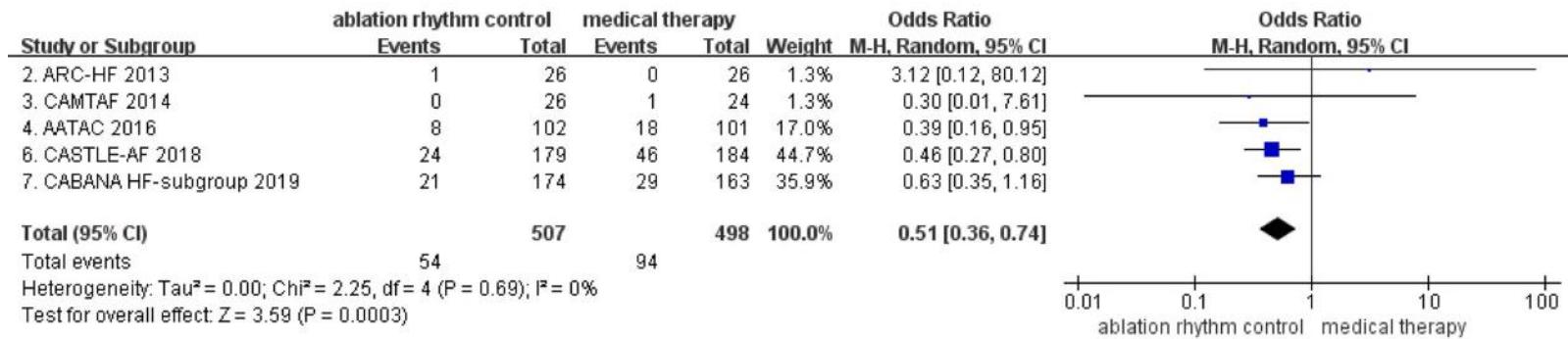
1° Endpunkt

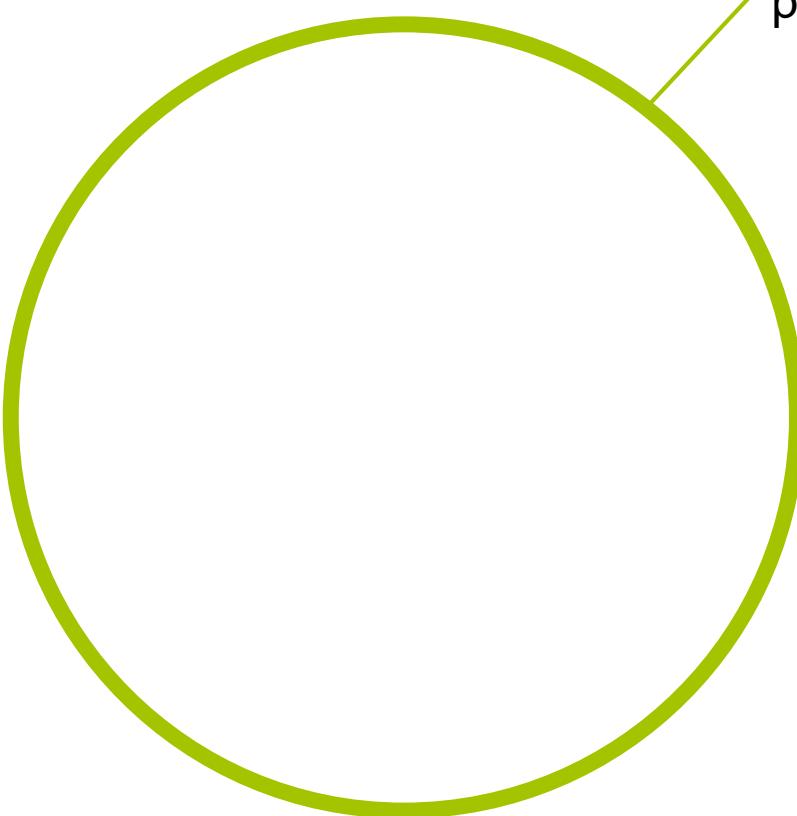
Tod
 Stroke
 Blutung
 Cardiac Arrest



stable CHF, Mortalität, ITT

Herzinsuffizienz





Vorhofflimmern-
population

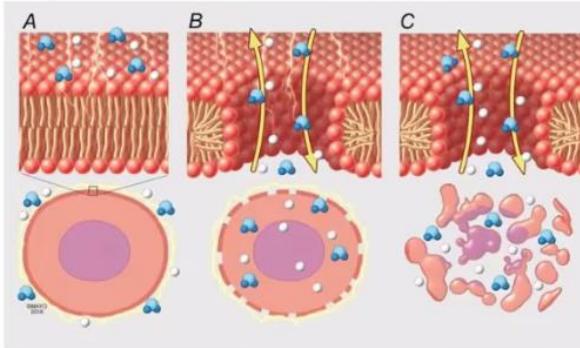
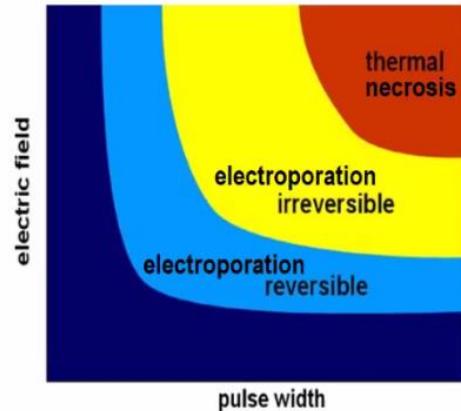
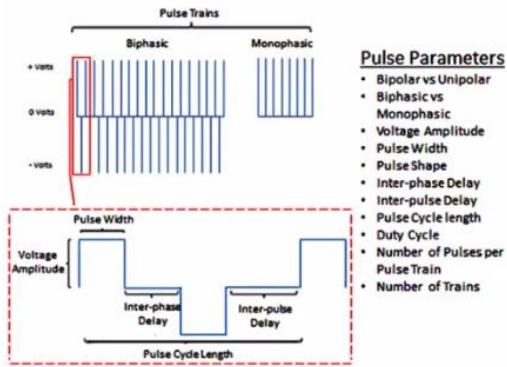
Womit?
■ Ablation? Technologie?

Technologie PVI: Pulsed Field Ablation (PFA)

Applikation eines elektrischen Feldes an ein Gewebe oder eine organische Substanz

Typische Parameter

- 500-3000 V/cm
- 1-100 Pulse
- Wellenlänge von ms
- Frequenzbereich 1-5 hz



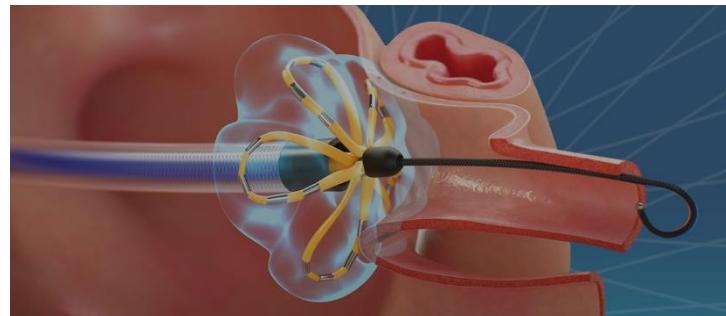
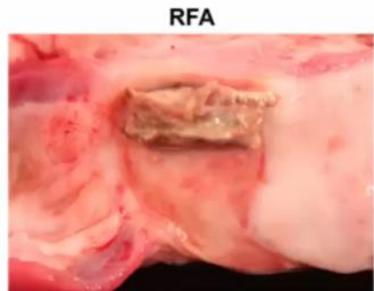
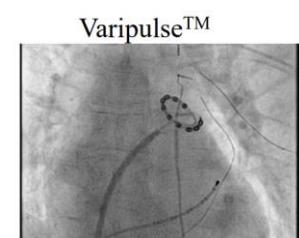
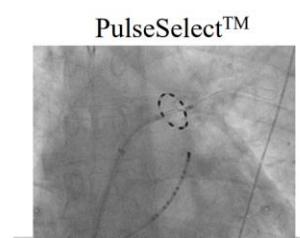
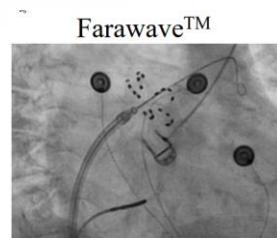
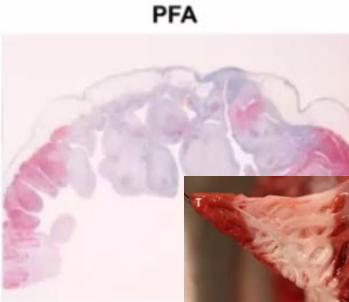
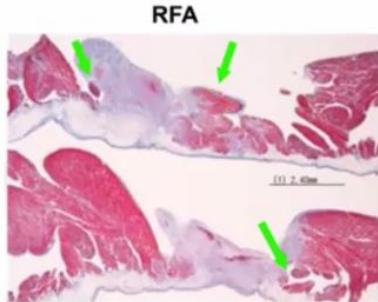
No pores formed
(subclinical effect)

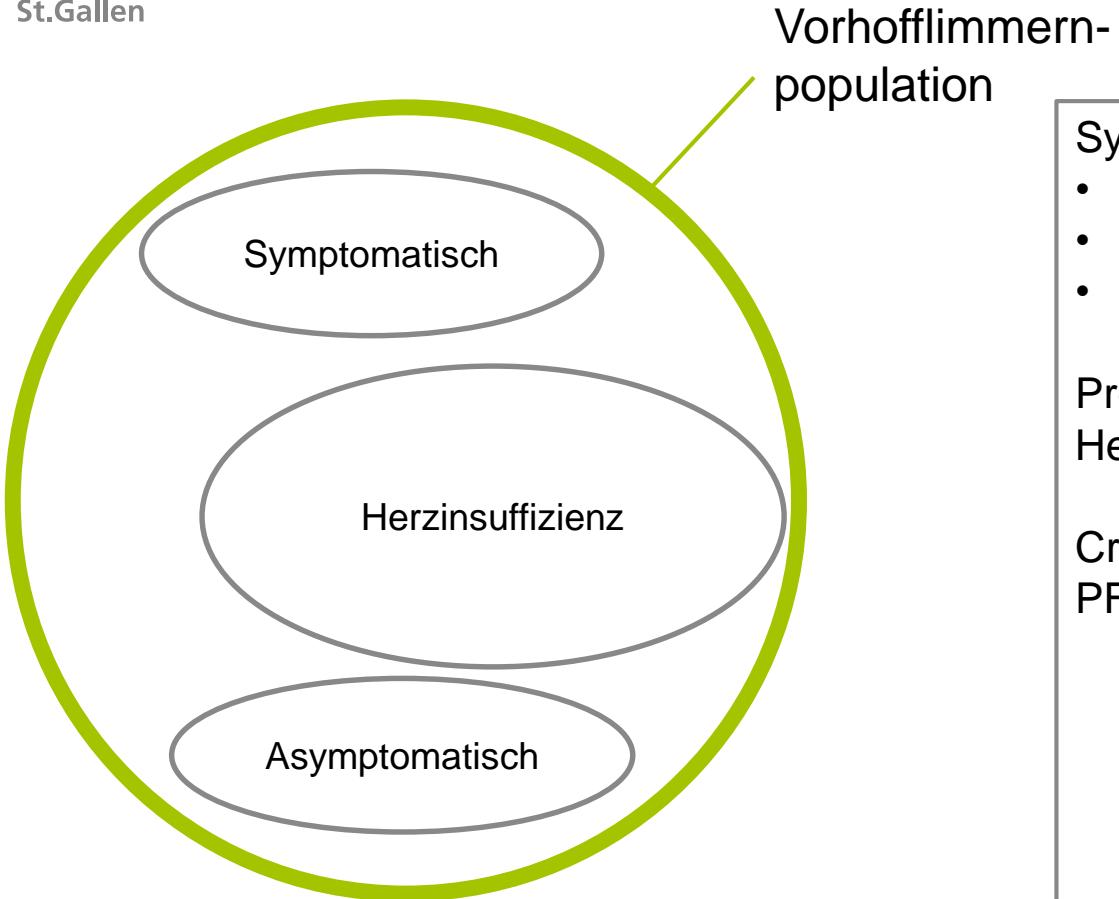
Transient pores form
(gene transfection)

Pores form and trigger
cellular apoptosis

Tissue Type	PEF Ablation Threshold (V/cm)
Nerve	3800
Vascular smooth muscle	1750
Red blood cells	1600
Liver	700
Kidney	600
Pancreas	500
Myocardium	400

Technologie PVI: Pulsed Field Ablation (PFA)





Symptomkontrolle

- Arrhythmielast ↓
- Frühzeitig! Paroxysmal!
- Ablation > Medikamente

Prognostisch? Asymptomatisch?
Herzinsuffizienz

Cryo und RFA bewährt
PFA