



Catheter Ablation of Ventricular Arrhythmia in Patients with an ICD

Systematic Review & Meta-Analysis



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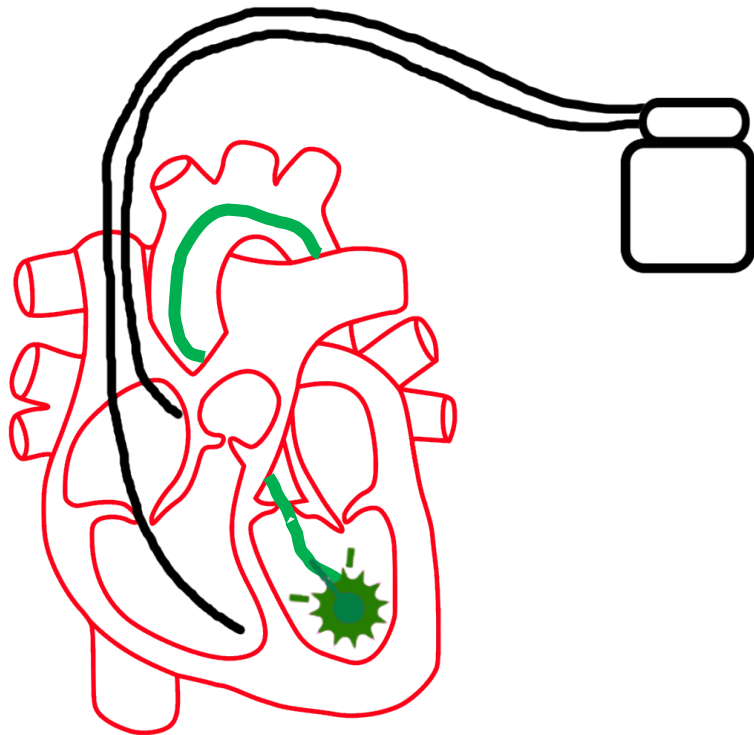
COI Disclosure

Khi Yung Fong:

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



Introduction



ICDs indicated for:

- Prevention of SCD
- Sustained VT
- VF

Catheter ablation of VT/VF

- Many advancements: mapping catheters, 3D electro-anatomy



Methods

Aim: Up-to-date evaluation of ablation vs control in patients undergoing ICD implantation, or with an existing ICD

RCT-only meta-analysis
9 open-label studies, 1103 patients

Experimental:

Catheter ablation of VT

- Before/during ICD implantation, or
- In patients with pre-existing ICD

Control:

No ablation or
delayed ablation



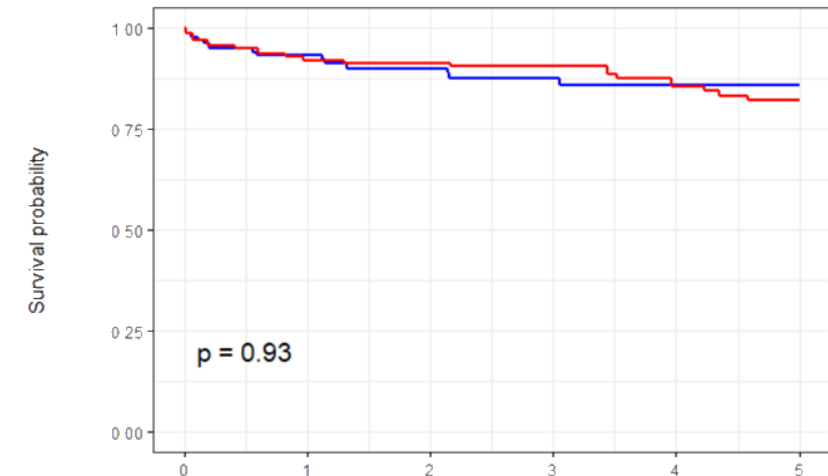
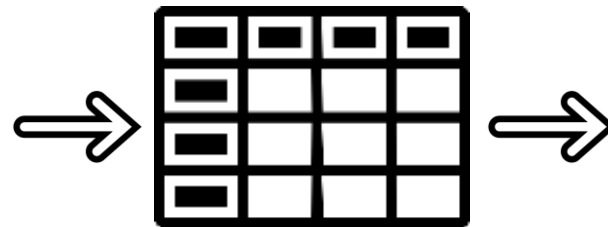
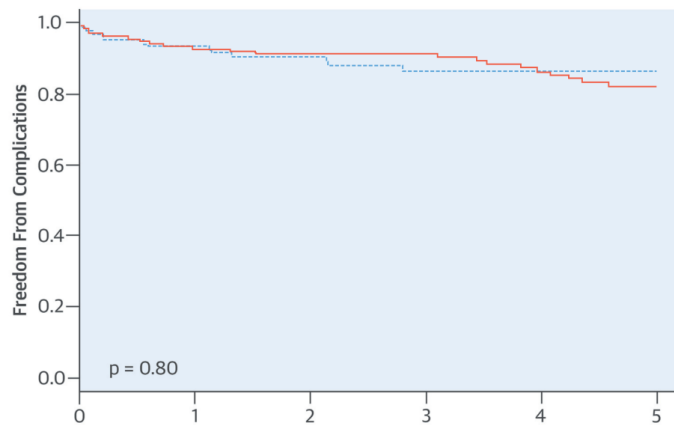
Methods

Primary outcomes: VT/VF recurrence, all-cause mortality

Individual patient data meta-analysis

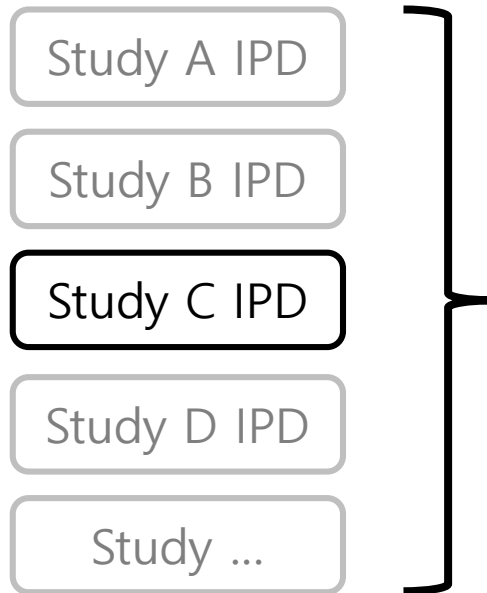
Graphical reconstructive algorithm for Kaplan-Meier curves

Guyot et al, *BMC Med Res Methodol.* 2012;12(1):9

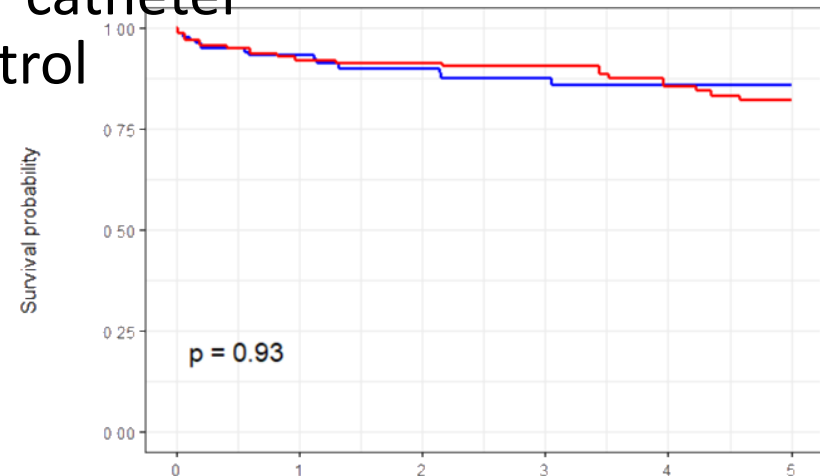


Methods

Primary outcomes: VT/VF recurrence, all-cause mortality



Hazard ratios (HR) for catheter ablation vs control



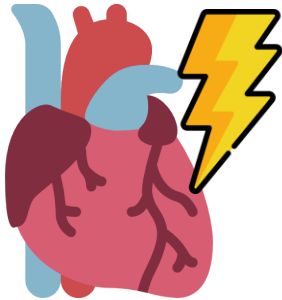
Methods

Secondary outcomes

Comparative meta-analysis



Cardiac
hospitalization



Electrical storm



Syncope

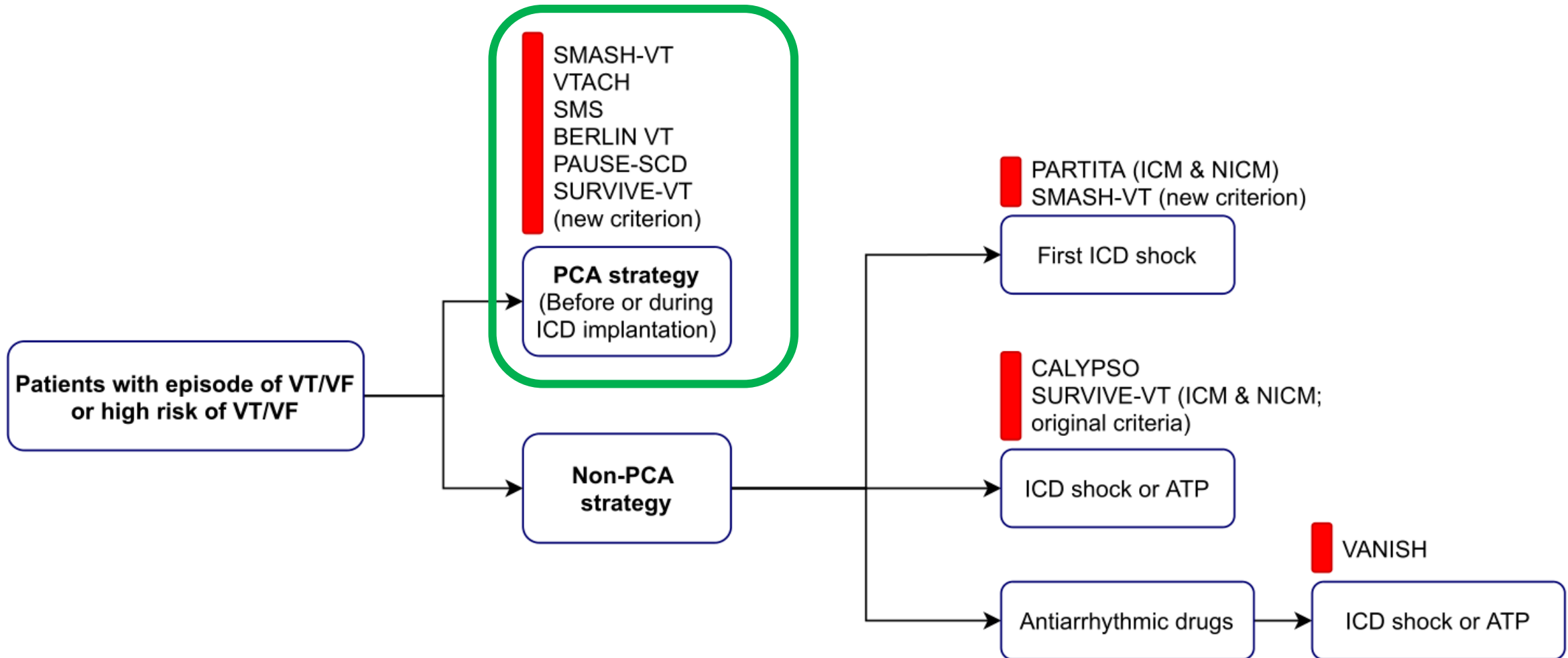


Appropriate
ICD therapy
(ATP, shock)



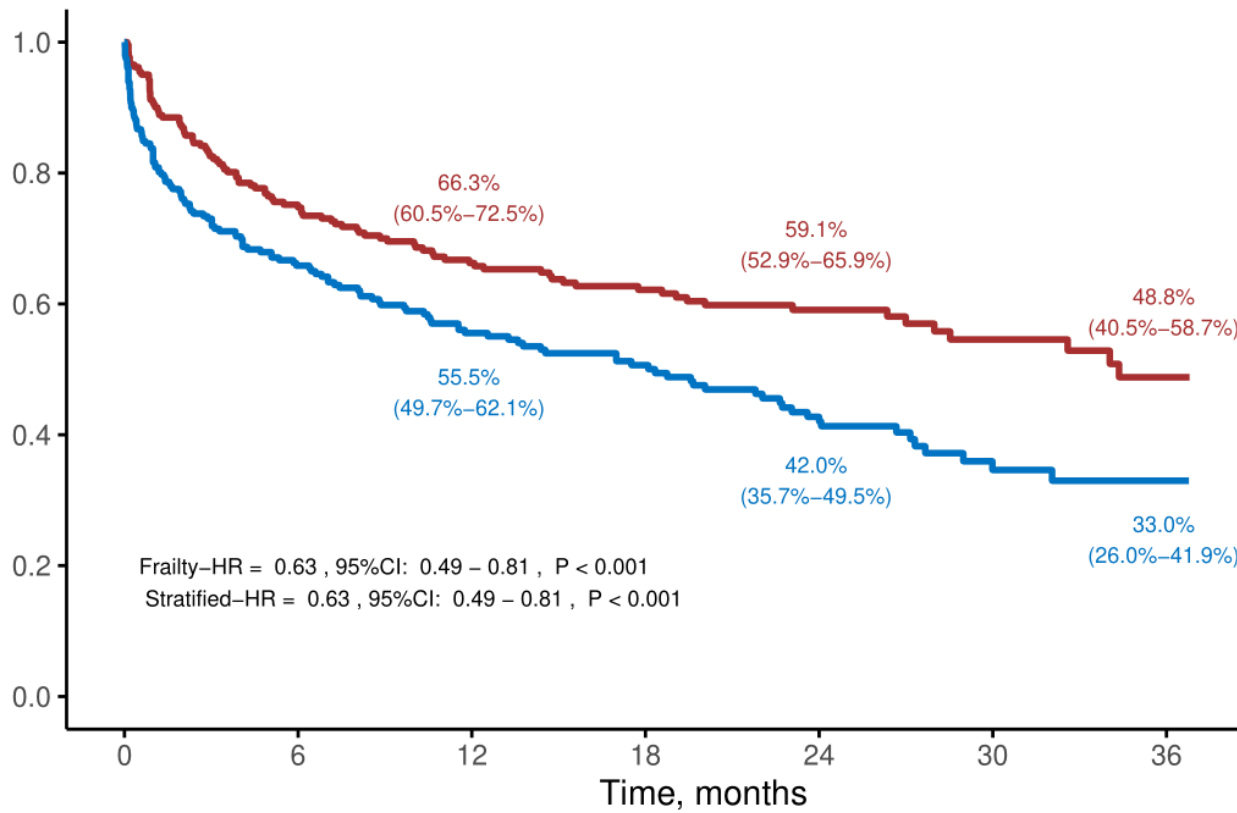
Inappropriate
shocks

Results



Results: VT/VF recurrence

Strata — Catheter Ablation — Control



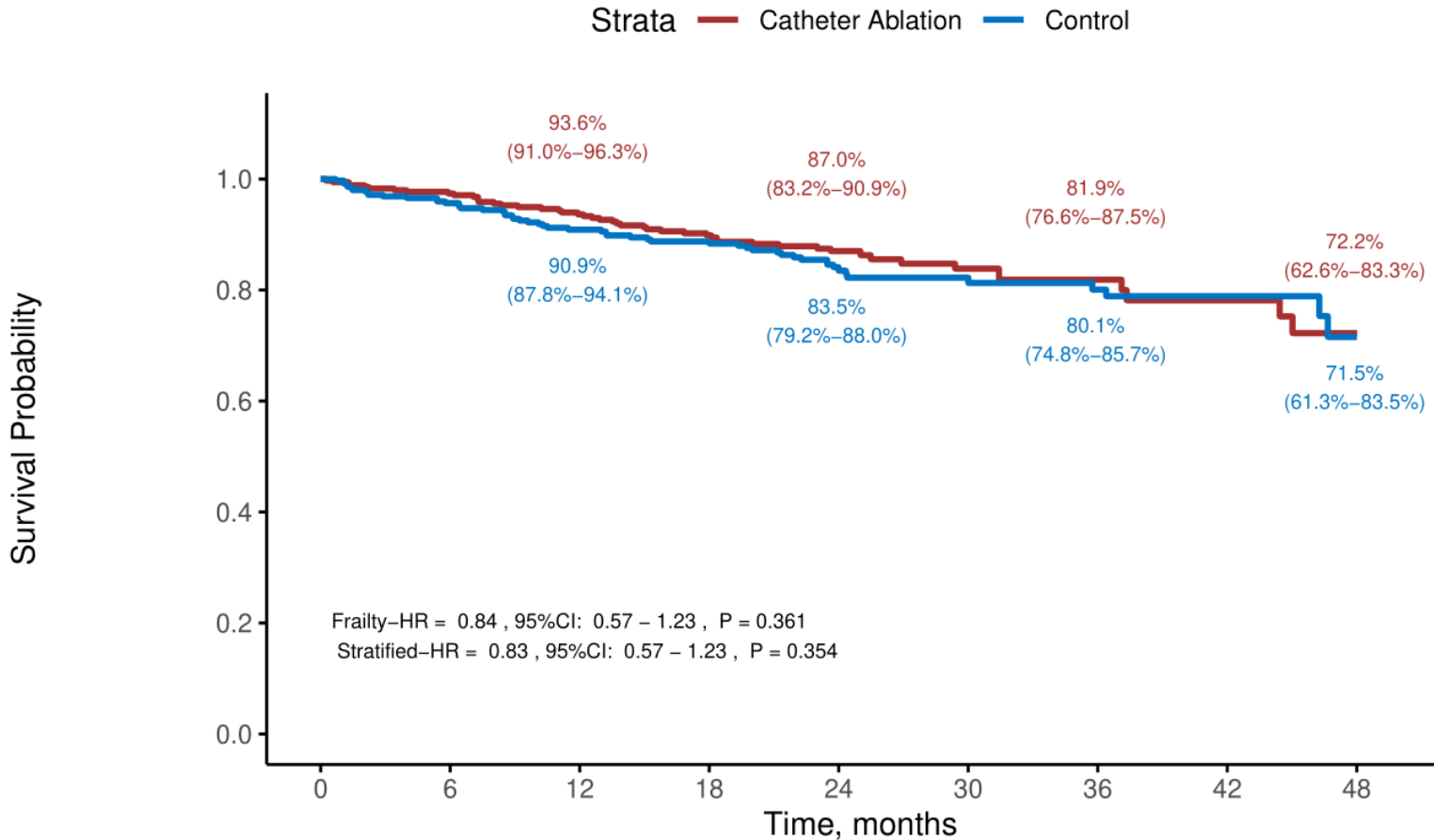
Ablation ↓ VT/VF recurrence vs control
(HR **0.63**, 95%CI **0.49-0.81**)

Subgroup analysis of PCA also significant
(HR **0.65**, 95%CI **0.50-0.84**)

Number at risk

Catheter Ablation	262	177	138	110	78	40	15
Control	278	158	113	83	59	26	10

Results: all-cause mortality



Number at risk

Catheter Ablation	355	321	287	238	138	94	67	32	19
Control	359	311	272	230	132	87	67	30	18

No mortality difference

Also not significant in
subgroup analysis of
PCA

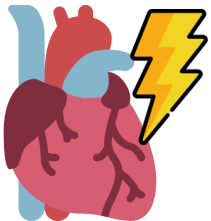
Results: secondary outcomes



Less cardiac hospitalization

HR **0.72**

95%CI 0.57-0.92



Less electrical storm

HR **0.51**

95%CI 0.30-0.96



Less appropriate therapy

RR **0.70**

95%CI 0.56-0.87



Similar rates of syncope

HR **0.69**

95%CI 0.26-1.84



Similar rates of
inappropriate shock

RR **1.06**

95%CI 0.66-1.71



Discussion

In theory...

- Lowers burden of future ICD shocks
- Ablation at later stages is less safe
- Insufficient study power? Inadequate follow-up time?

Procedural risks*

- Ablation-related complications: 8.3%
- In-hospital mortality: 1.1%

**Circulation*. 2022 Jun 21;145(25):1839-1849; *Circulation: Arrhythmia and Electrophysiology*. 2015;8(2):362-370

According to guidelines*...

- Reserved for patients with recurrent ICD shocks despite optimal AAD & device programming
- First episode of sustained VT in IHD with ICD

*2019 HRS/EHRA/APHRS/LAHRS expert consensus statement on catheter ablation of ventricular arrhythmias

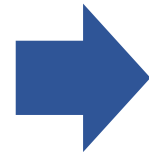


Discussion

When should ablation be performed?

PARTITA

VT/VF +
ICD implantation



Observe till
1st ICD shock



Immediate ablation

No ablation

*All-cause mortality benefit at 2 years!
→ Observing till the 1st ICD shock helps*

BERLIN-VT

VT/VF +
ICD implantation



Observe till
3rd ICD shock



Ablation

+ Prophylactic ablation

*No difference in mortality!
→ Waiting till the 3^d ICD shock may be too late*




Discussion

Ablation at the 1st or 2nd ICD shock?

Current Cardiology Reports (2020) 22: 91
<https://doi.org/10.1007/s11886-020-01345-7>

INVASIVE ELECTROPHYSIOLOGY AND PACING (E KEVIN HEIST, SECTION EDITOR)

Optimal Timing of VT Ablation for Patients with ICD Therapies

Andrea Radinovic¹  • Francesca Baratto¹ • Paolo Della Bella¹

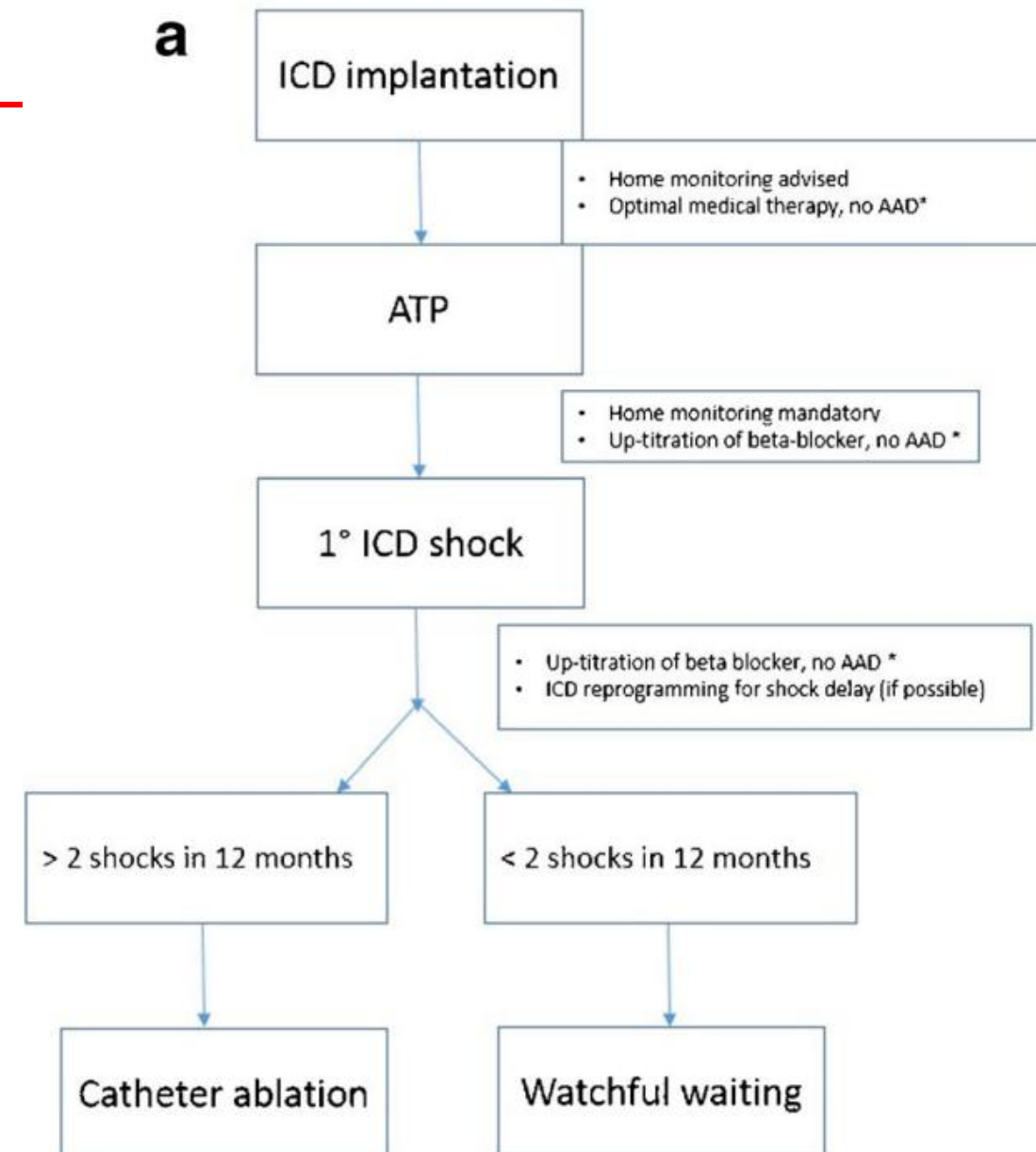
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- Patients must 'earn' their ablation by manifesting an active arrhythmia pattern
- More trials needed
- Close monitoring is essential



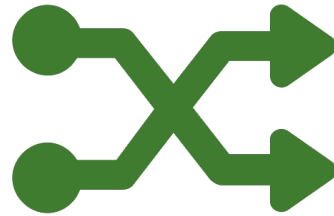
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Limitations



Low number of available studies; many types of study designs

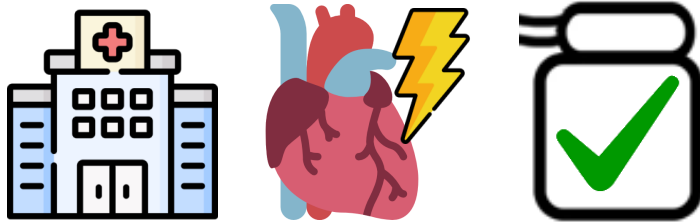


Dropouts & crossovers frequent

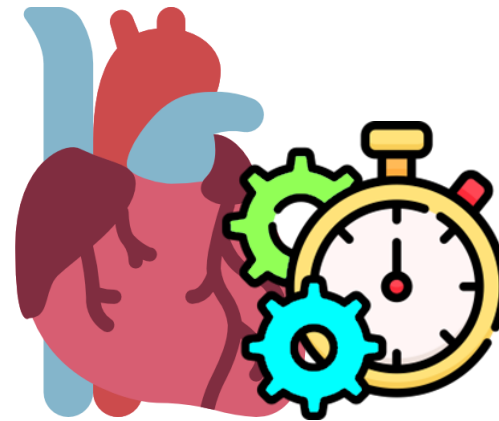


Applicability to lower-volume centers

Closing Remarks



Catheter ablation reduces VT/VF recurrence & most other adverse outcomes, except mortality



Future studies needed to investigate optimal timing of ablation





Thank you!

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