

TACHICARDIE VENTRICOLARI

Recidiva di TV dopo ablazione: criteri clinici per reintervenire

Pasquale Vergara

**Advanced Cardiac Arrhythmia Program,
Head**



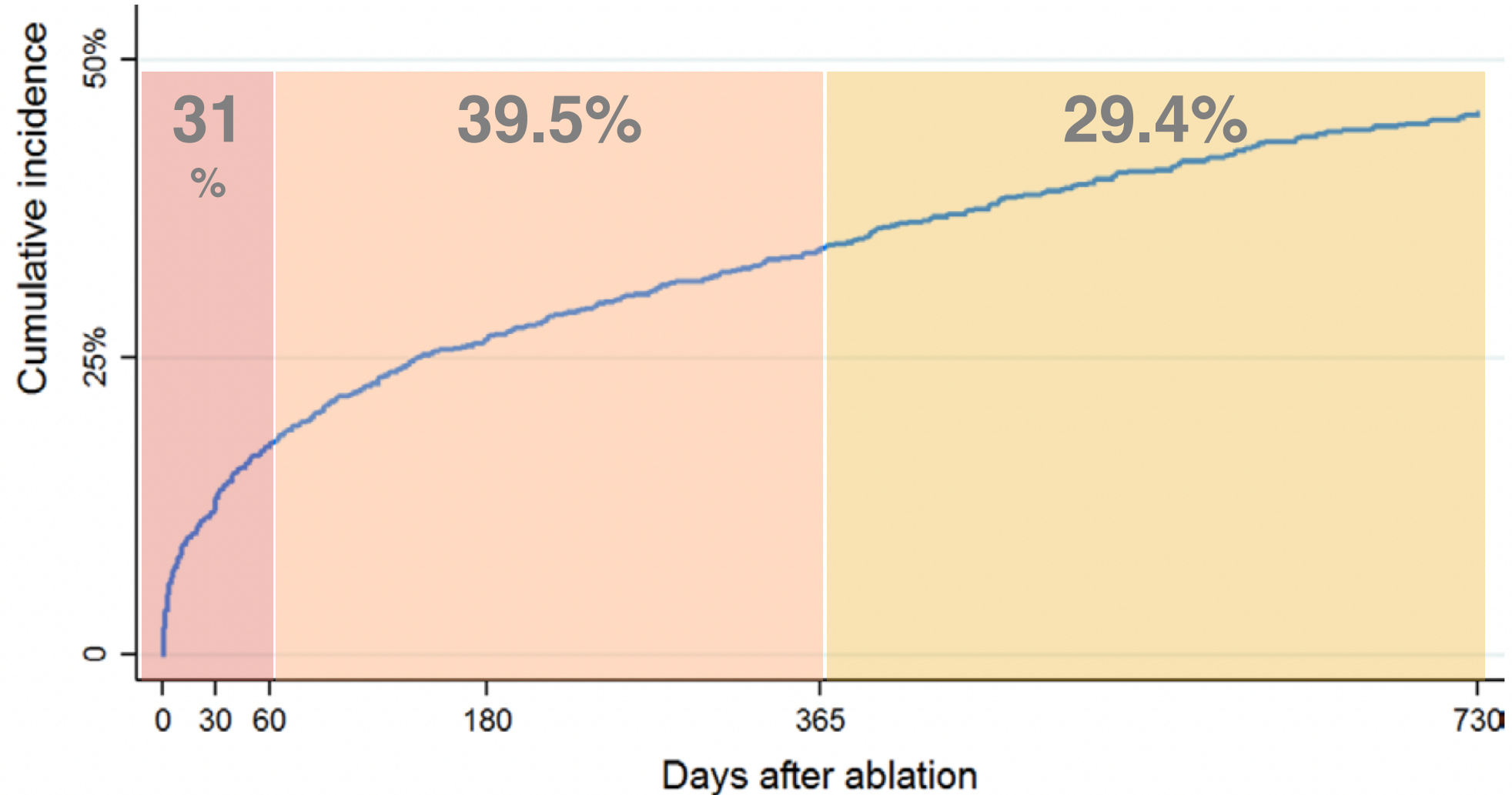
Cardiologia
Federico II



UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II

Is VT recurrence relevant?

1412 patients: *605 VT recurrence; 807 no VT recurrence*

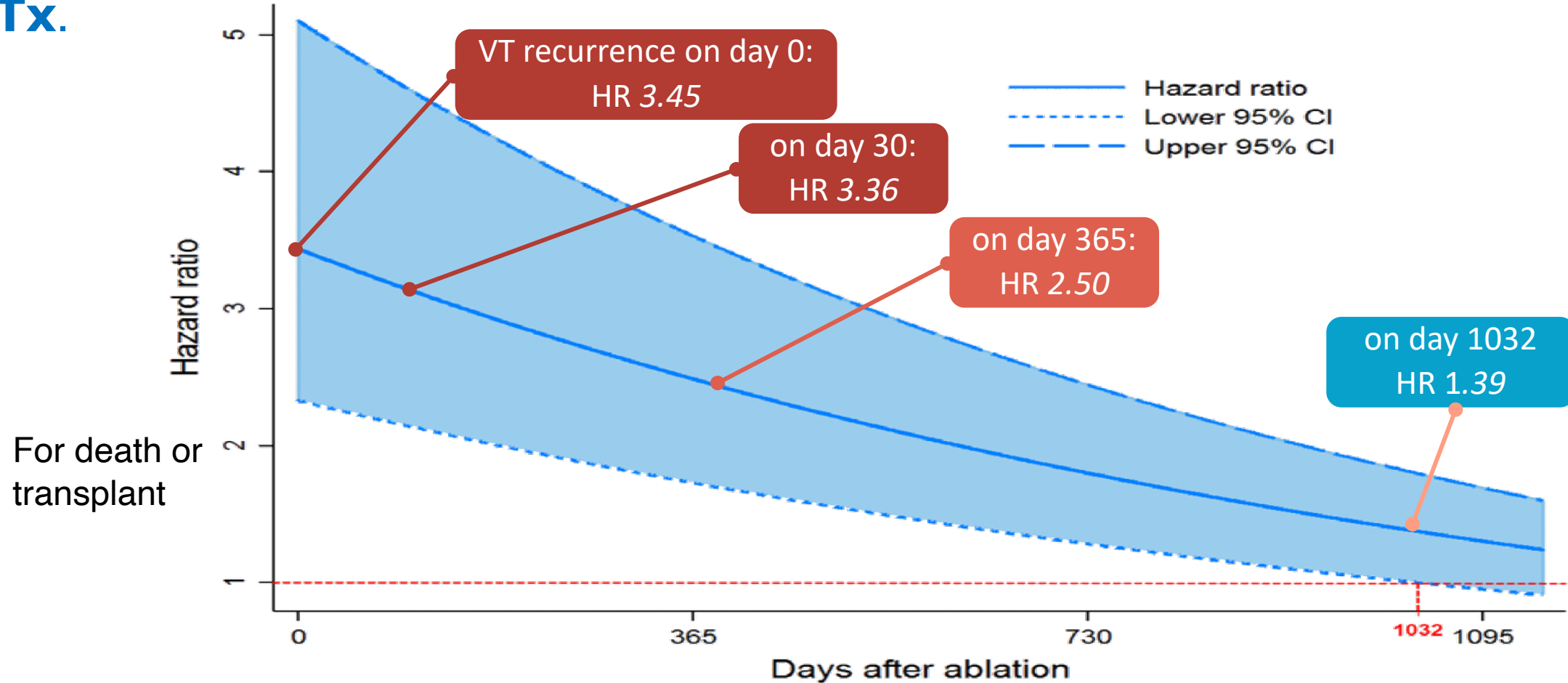


Prognostic impact of VT recurrence

Siontis Circ AE 2016;9:e004432

Among the 605 patients **with VT recurrence**, **31.4%** patients experienced **death or HTx**

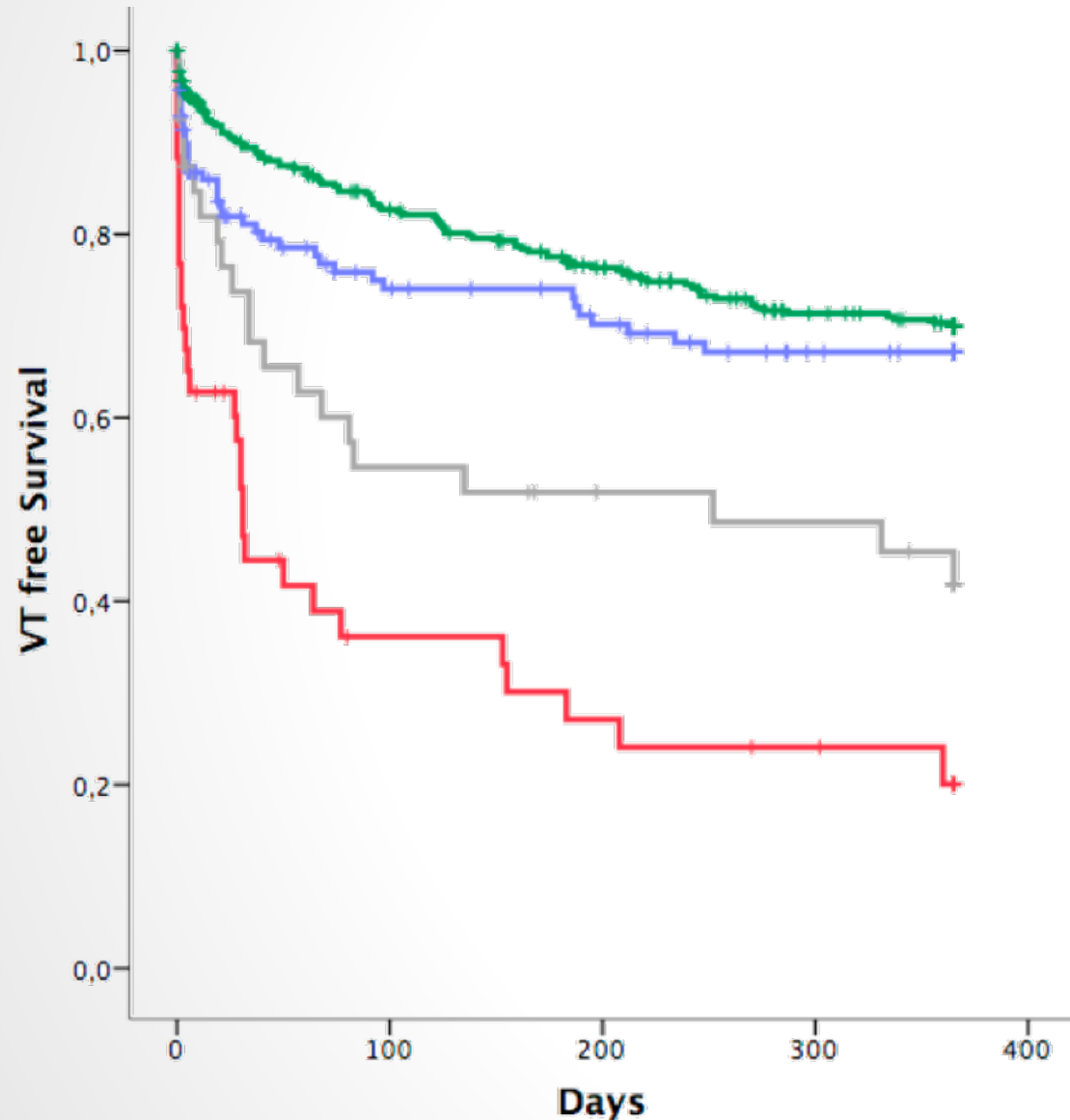
Among the 807 patients **without VT recurrence**, **22.9%** experienced **death or HTx**.



Mortality risk is highest immediately post-ablation and decays overtime

Is VT recurrence following an initial ablation procedure is a stochastic event?

VT Recurrence



No inducible VT @PES after ablation
Only non-clinical inducible VT

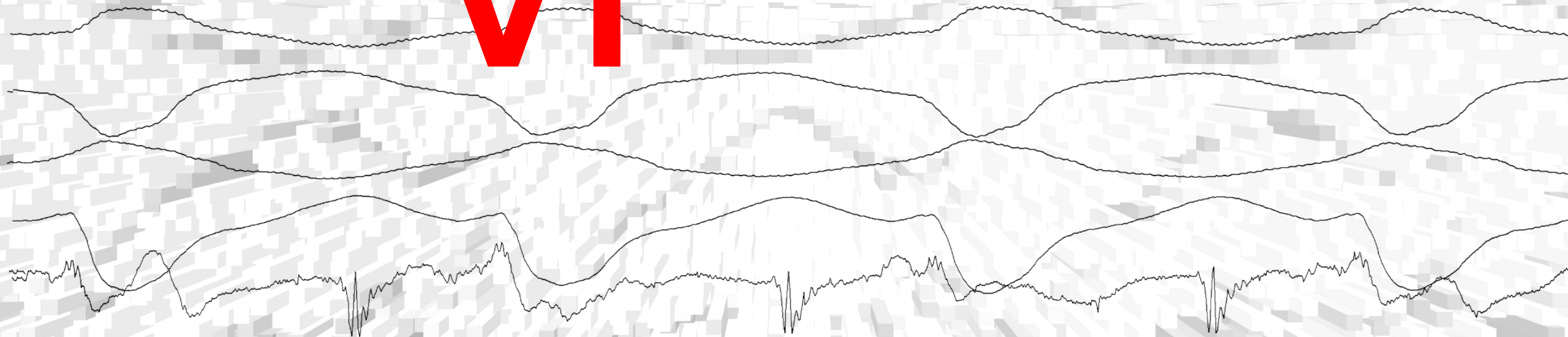
Not tested

Clinical inducible VT

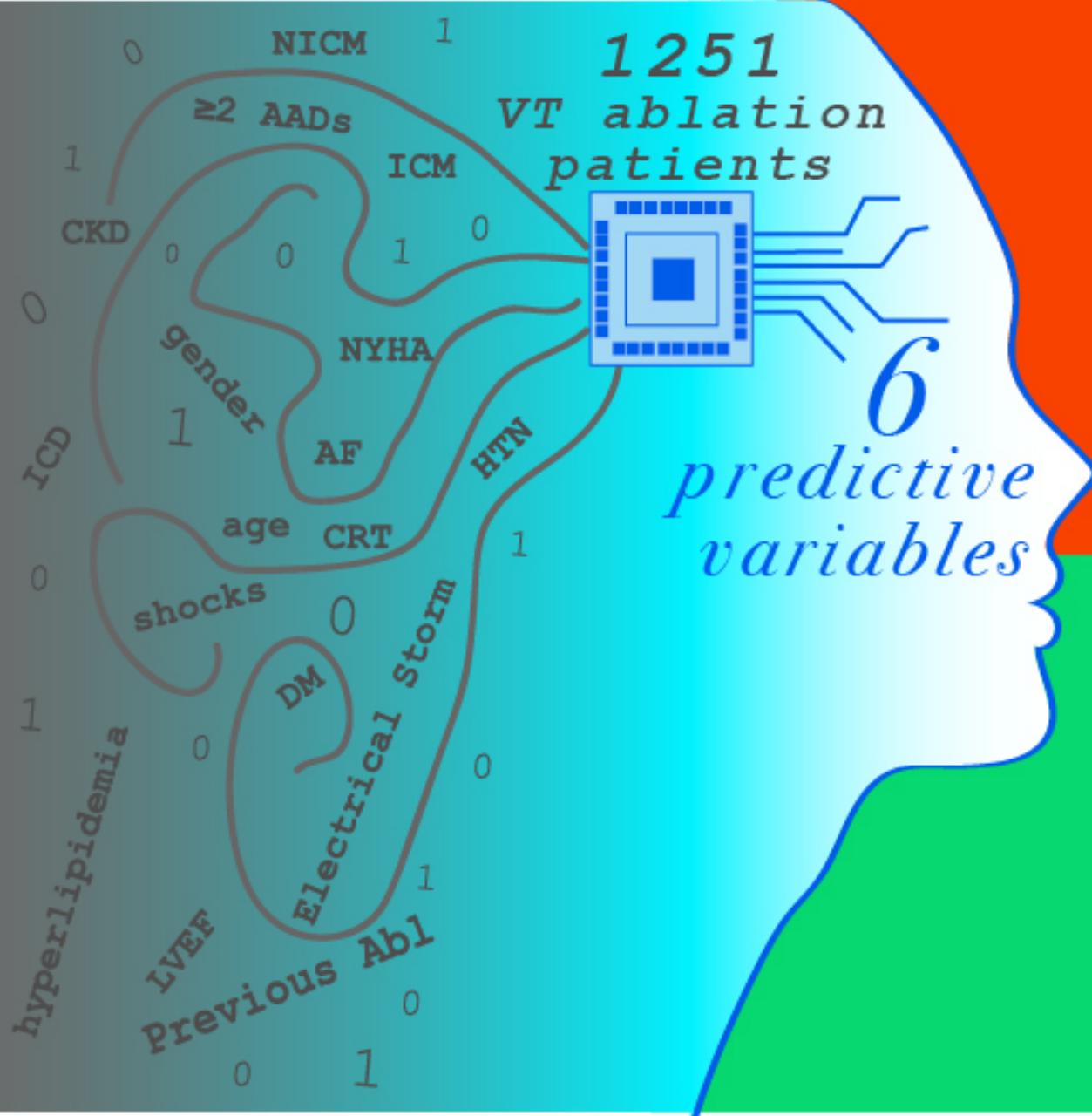
I-Score

predicting VT ablation outcome

VT



I-VT score: survival tree analysis for VT ablation patients



High Risk

Recurrence HR: 2

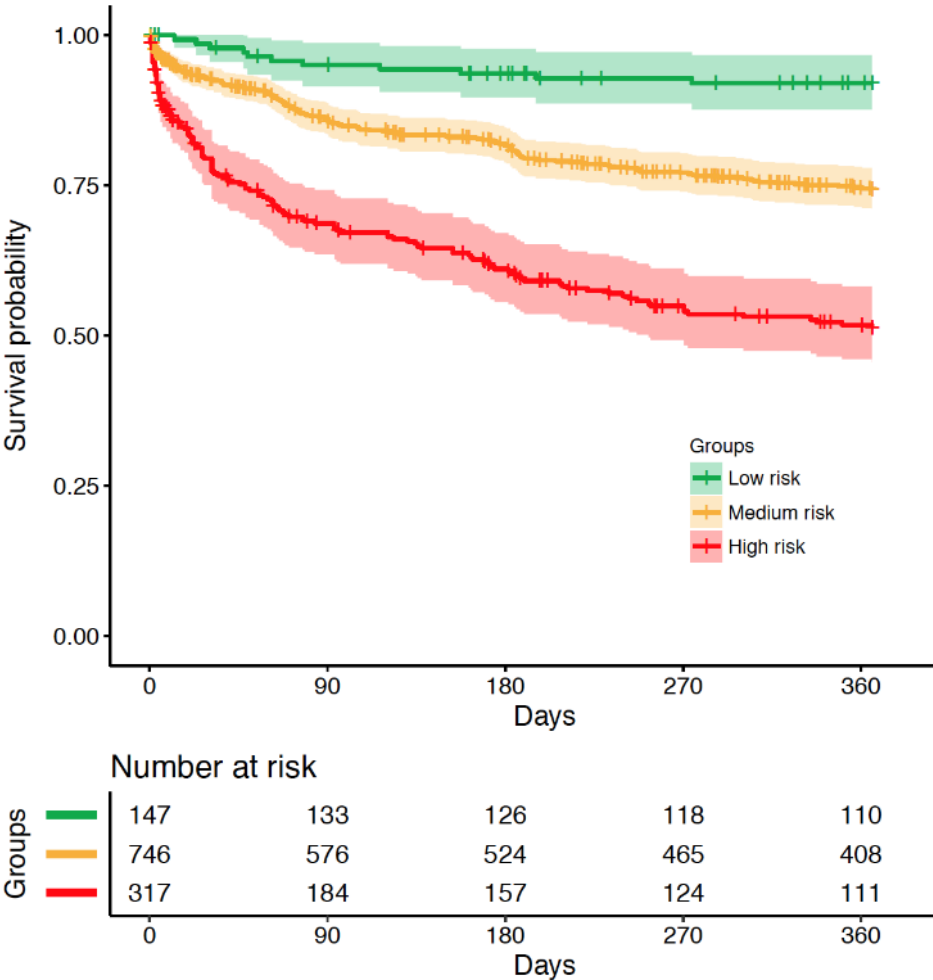
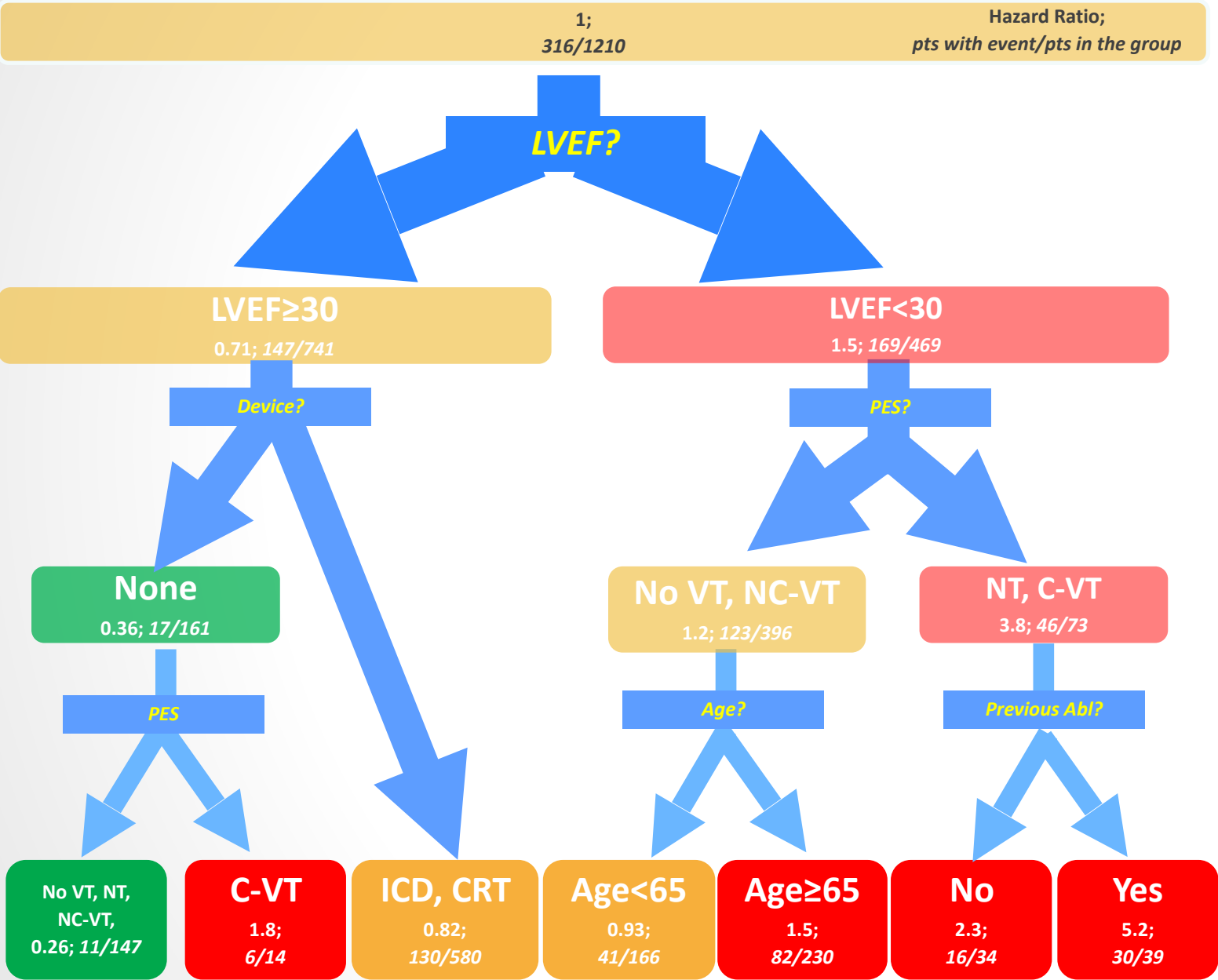
Death HR: 1.7 - 4.3

Low Risk

Recurrence HR: 0.086-0.63

Death HR: 0.088-0.58

www.vtscore.org

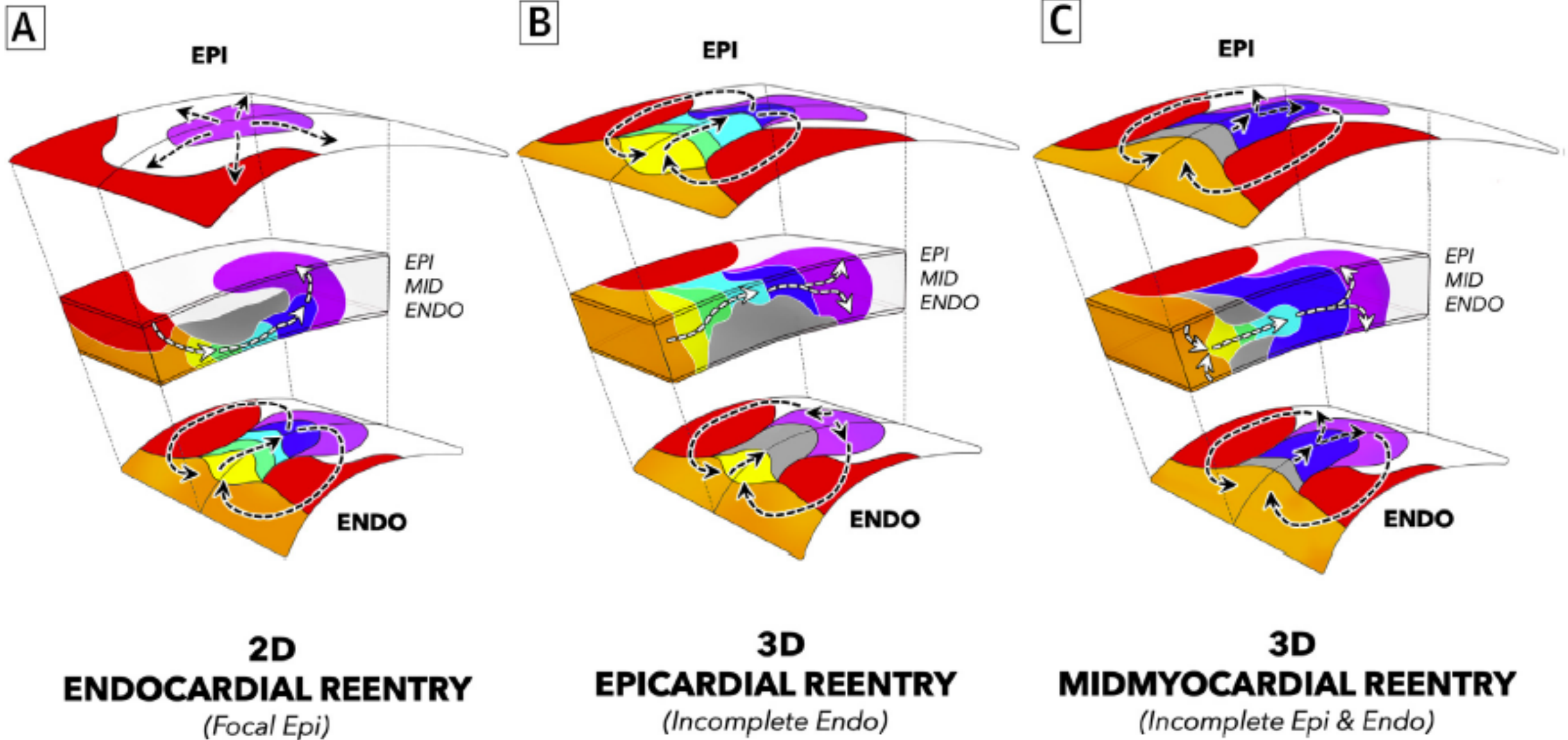


VT recurrence following an initial ablation procedure is **rarely a stochastic event;**

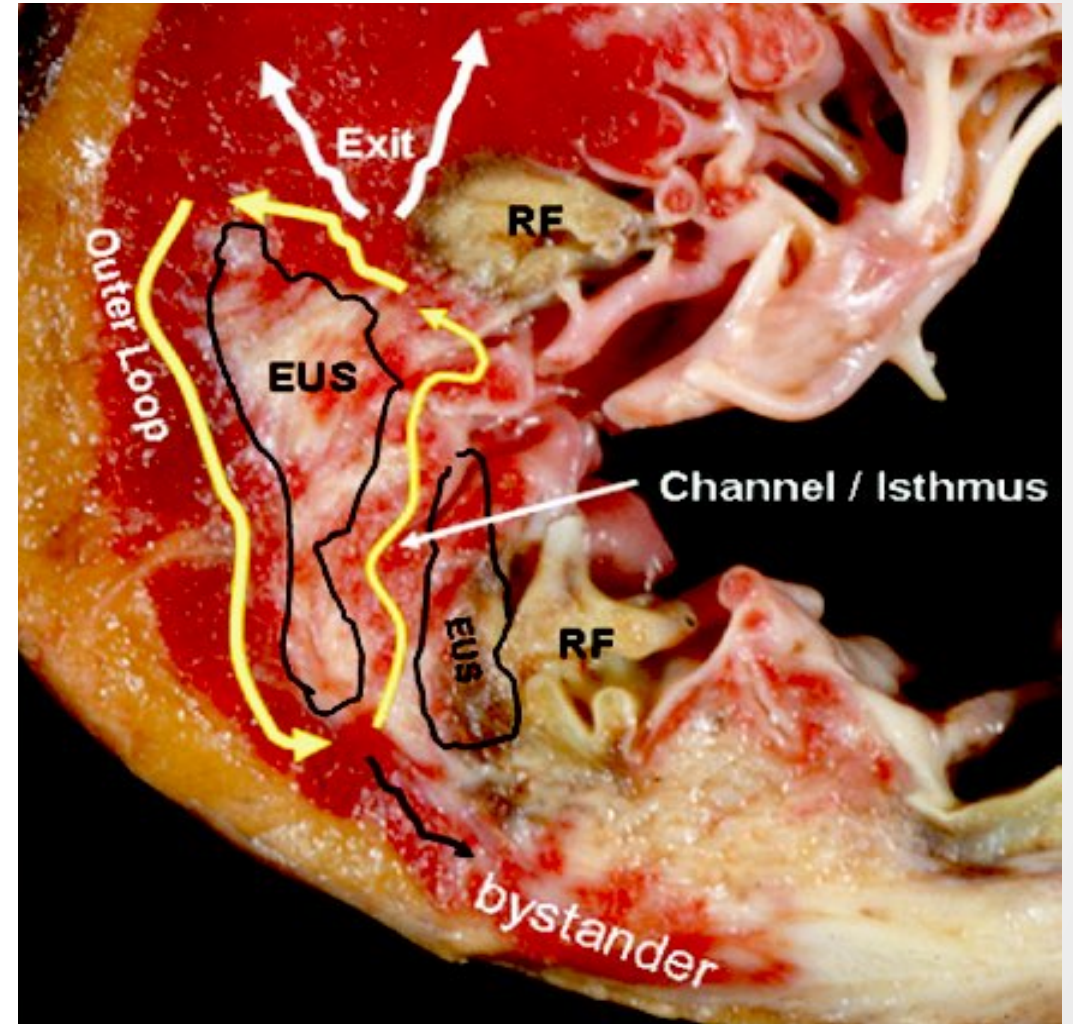
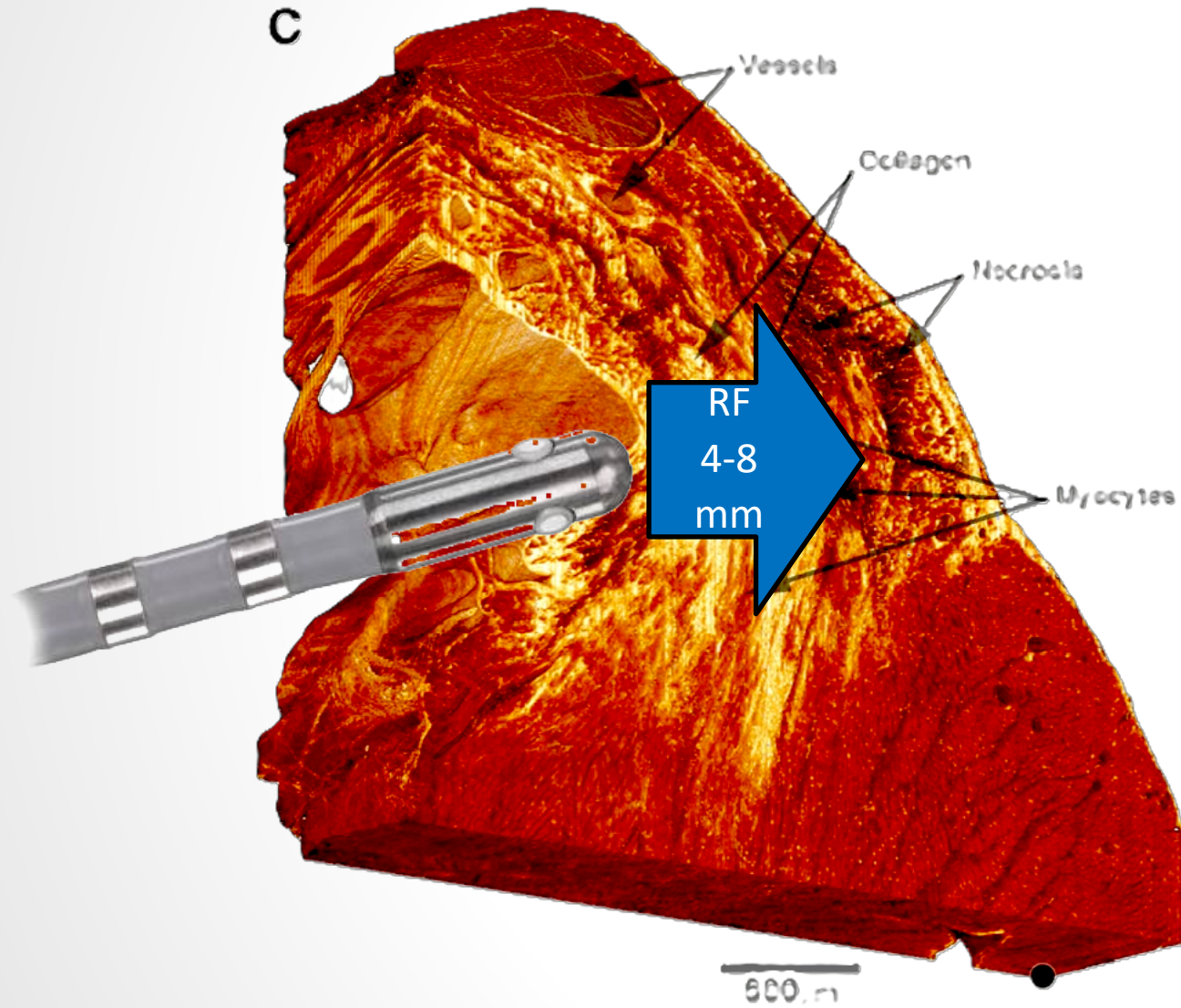
rather, it is a **predictable outcome** of patient's clinical trajectory, the underlying myocardial architecture, and the limitations of current ablation technologies.

Simultaneous Endo Epi analysis of 3D VT circuit

Tung Circulation 2020



Scar tissue post Myocardial Infarction



Clinical profile of Repeat ablation Candidates

Tzou - Outcome repeat VT - HR 2017

Repeat candidates present with inherently more complex substrates.

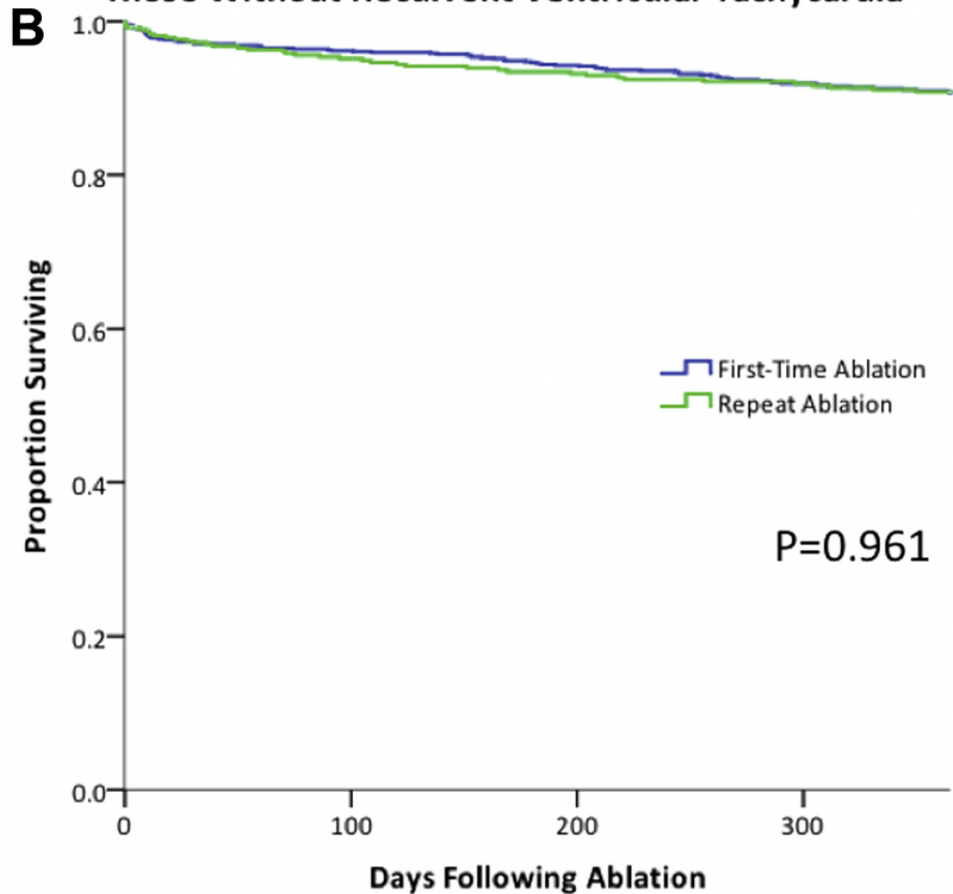
Clinical Marker	1RFA (First-Time)	>1RFA (Repeat)
Nonischemic Cardiomyopathy	41%	53%
Repeat ablation (>1RFA) patients face a higher prevalence of nonischemic cardiomyopathy (NICM) at 53%, compared to 41% in first-time (1RFA) patients. ^[2]		
VT Storm	33%	38%
They also present with a higher burden of drug-refractory electrical VT storm (38% vs 33%). ^[2]		
Epicardial Access Required	21%	41%
Procedural complexity is vastly increased during repeat interventions. ^[2] Epicardial access is required in 41% of repeat procedures, nearly double the 21% rate of first-time procedures. ^[2]		

Consequently, repeat procedures are significantly longer and frequently target unmappable tachycardias.

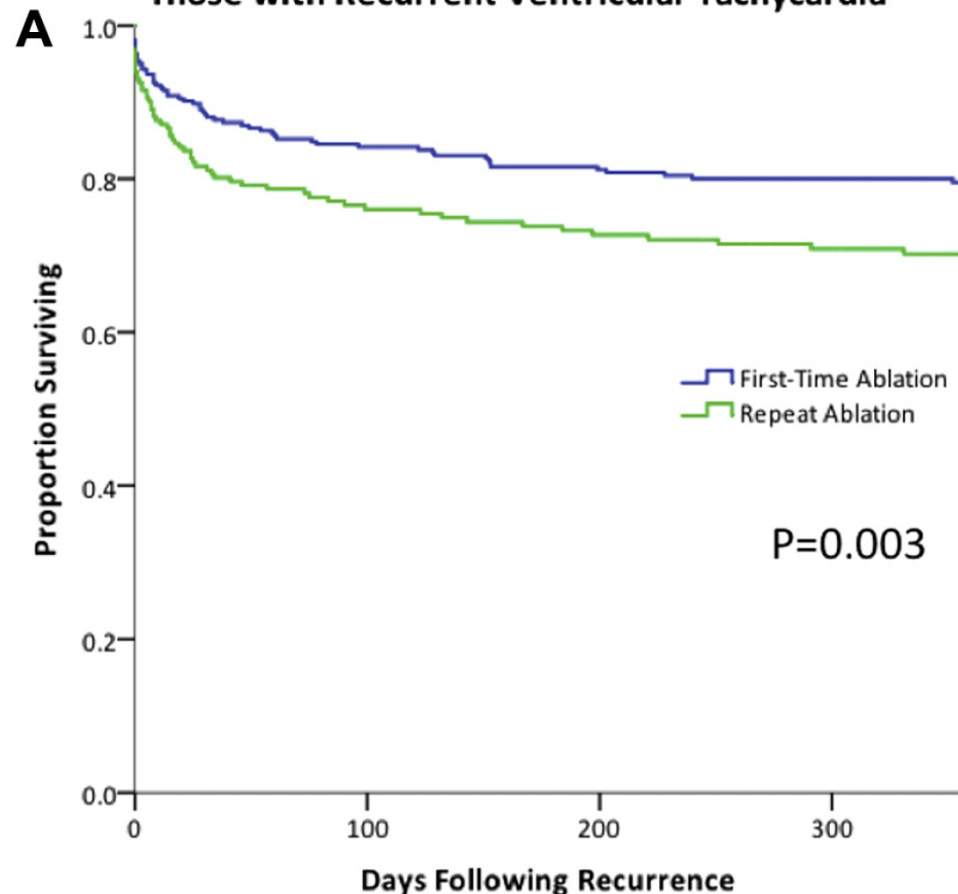
Patients without VT recurrence after a repeat ablation achieved a **93% survival rate**, comparable to the 92% survival of successful first-time procedures

If a repeat procedure fails to control VT, the patient **survival plummets to 67%**

B Survival Based on First-Time Versus Repeat Ablation Among Those Without Recurrent Ventricular Tachycardia

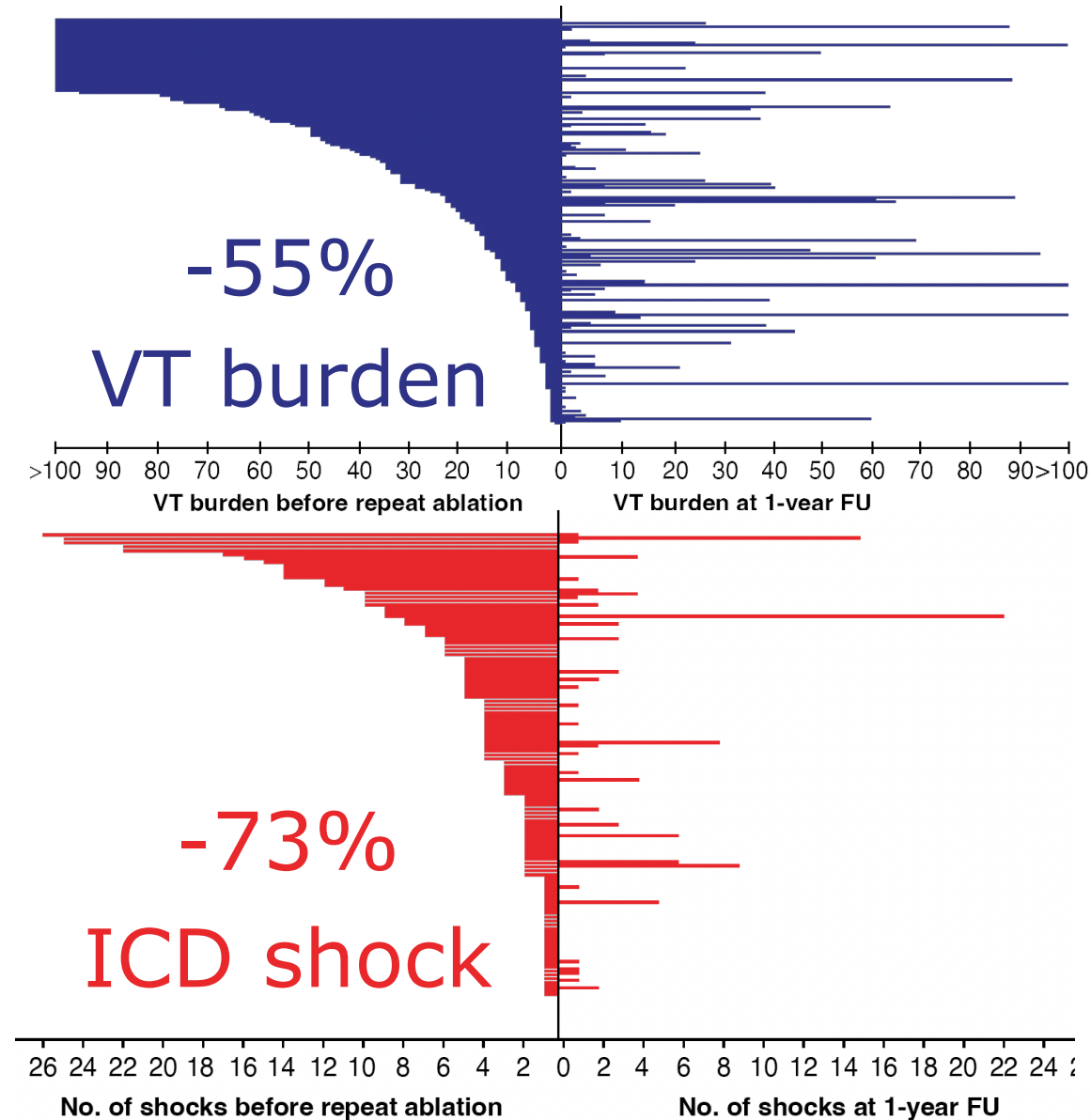


A Survival Based on First-Time Versus Repeat Ablation Among Those with Recurrent Ventricular Tachycardia



21
0

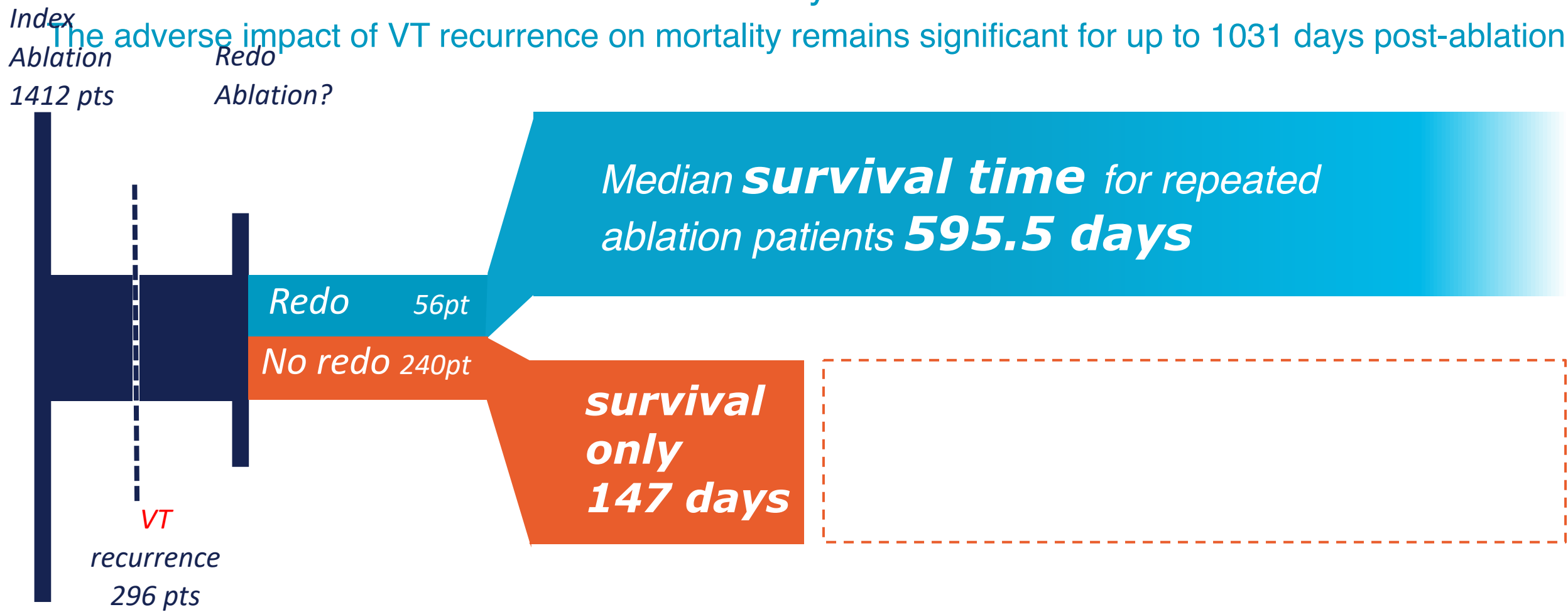
SHD patients who underwent repeat ablation for
VT



What happens if we decide to
do not reablate
patients with recurrence after a first ablation?

19% of 296 patients with VT recurrence underwent **repeat ablation** @ 309 days

The adverse impact of VT recurrence on mortality remains significant for up to 1031 days post-ablation



Patients undergoing redo ablation experience significant survival benefit

History of myocardial infarction; ICD

VT during treatment with amiodarone or class I or III AAD within previous 6 months

259 patients

Catheter ablation

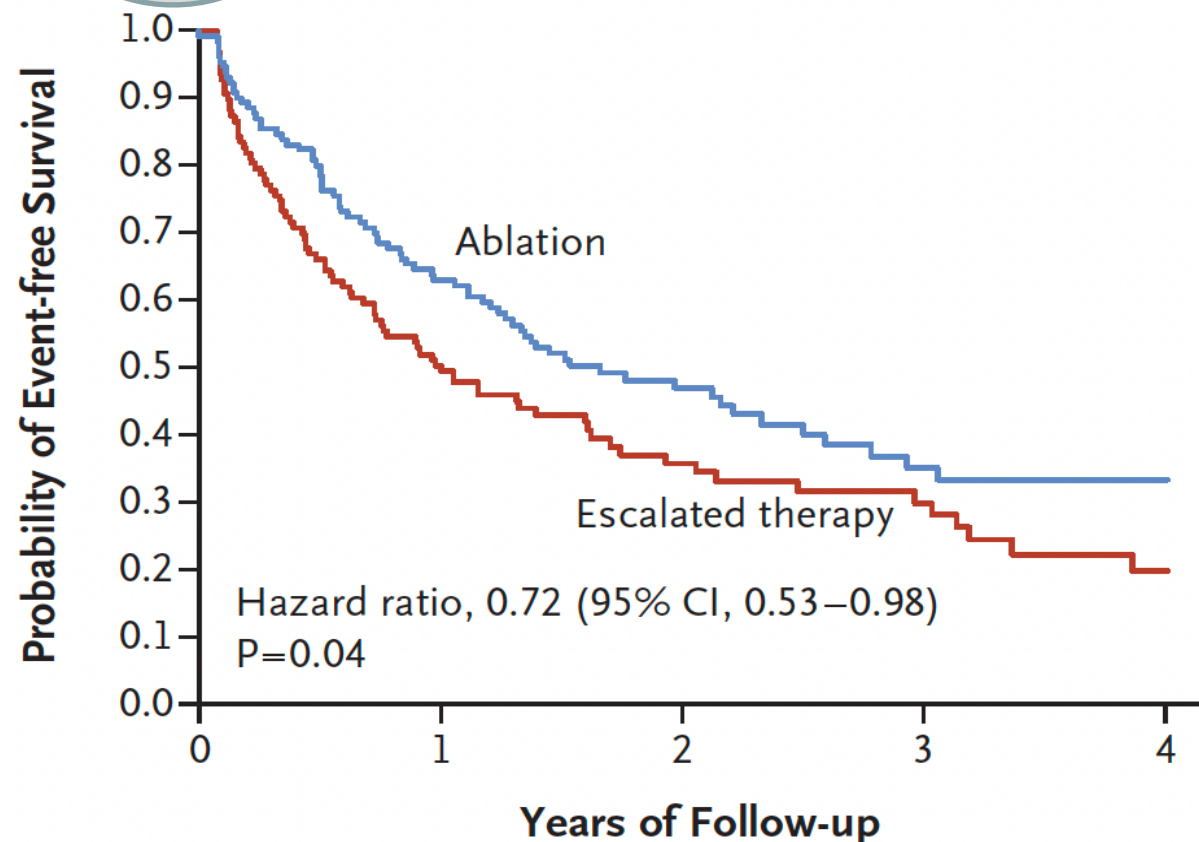
1:1

R

Escalated therapy

Primary outcome:

- Composite of:
 - ✓ **death,**
 - ✓ **VT storm,**
 - ✓ **appropriate ICD shock**
after 30-d treatment period



AAD failure lowers threshold for REDO

Definition and consequences of refractory status



Recurrent VT despite Class III AAD is primary indication to intervention

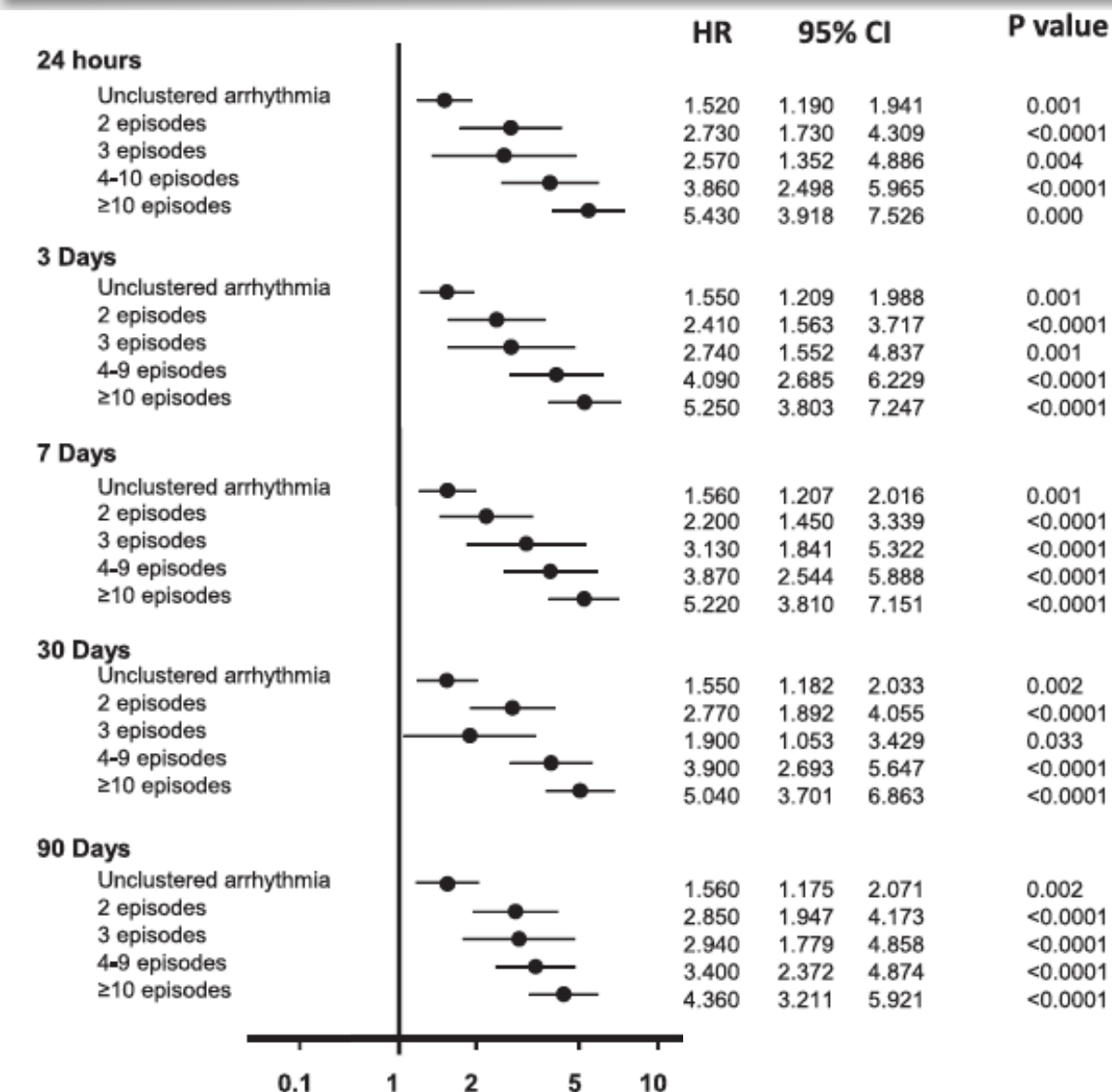
“Refractory” encompasses suppression of arrhythmias, but also intolerance to side effects

Amiodarone is highly effective, but side-effects lead to cessation of treatment in 25% patients

When ?

Mortality after VT clusters

Elsokkari Progress Cardiovasc Dis 2021; 66: 70–79



Higher mortality risk in
higher numbers of VA
episodes within a
shorter cluster

Hazard ratio (HR) for mortality according to ventricular arrhythmia burden against the reference group of patients with no ventricular arrhythmia

Risk of recurrent VT/VF

PARTITA

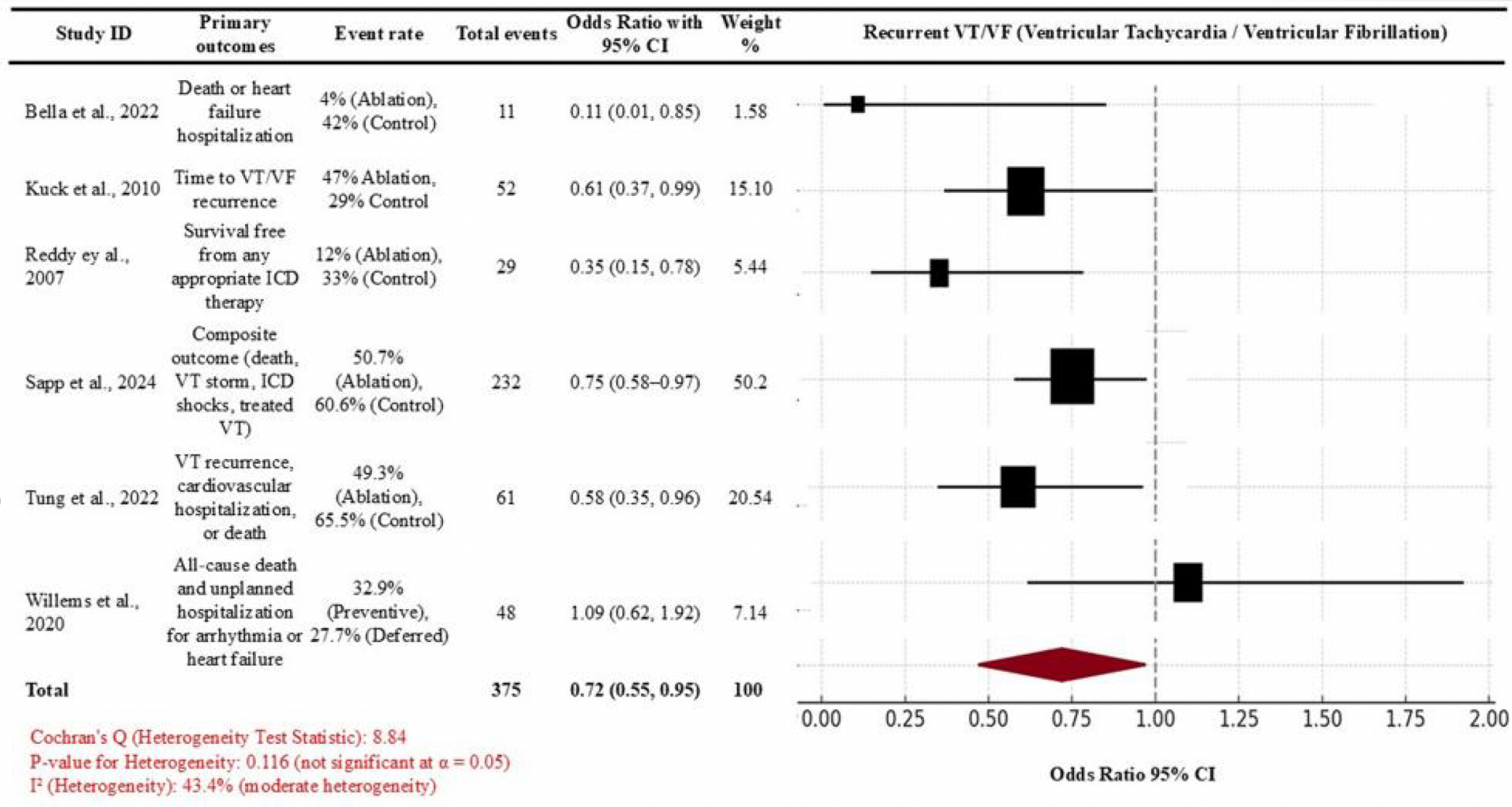
VTACH

SMASH-VT

VANISH2

PAUSE-SCD

BERLIN VT



Cardiovascular mortality

PARTITA

Della Bella, 2022

3

8

Odds Ratio with 95% CI

0.36 (0.09, 1.45)

Weight %

7.8

VTACH

Kuck et al., 2010

7

10

0.68 (0.26, 1.80)

12.3

SMS

Kuck et al., 2017

10

15

0.63 (0.28, 1.42)

15.7

SMASH-VT

Reddy et al., 2007

6

12

0.48 (0.17, 1.31)

10.2

VANISH2

Sapp et al., 2024

20

35

0.57 (0.32, 1.01)

30.5

PAUSE-SCD

Tung et al., 2022

12

18

0.67 (0.30, 1.49)

14.5

BERLIN VT

Willems et al., 2020

5

7

0.71 (0.22, 2.25)

9

Total effect

63

105

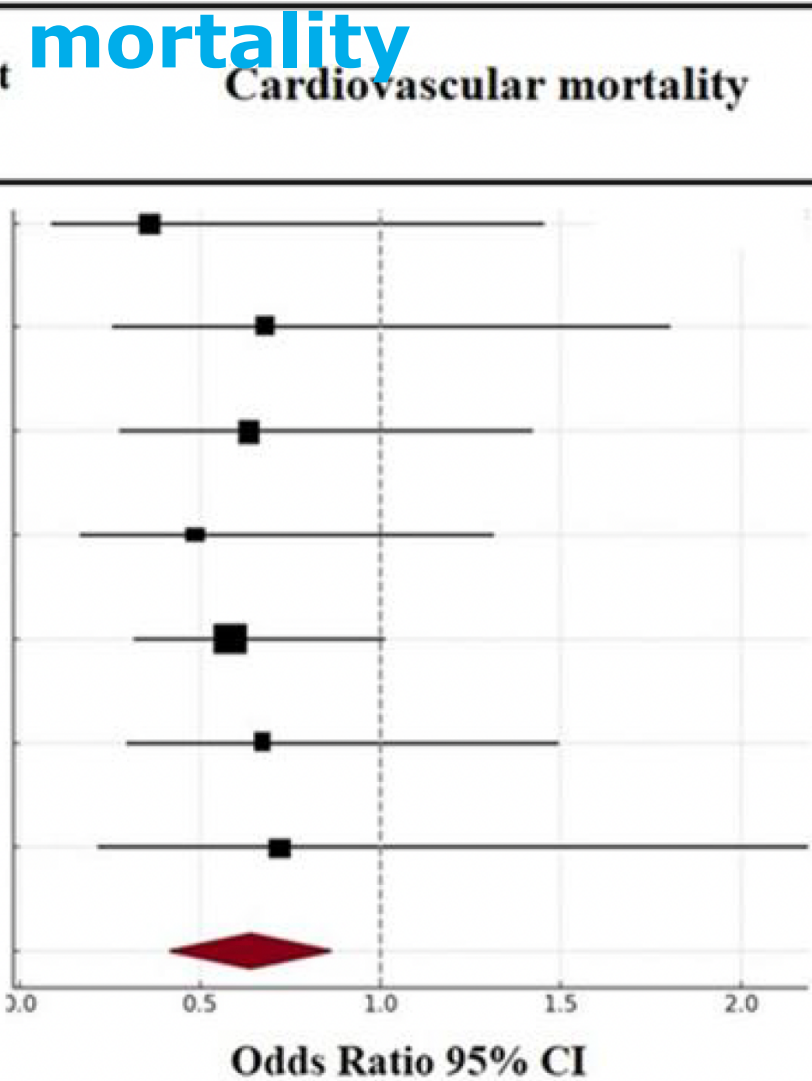
0.59 (0.43, 0.82)

100

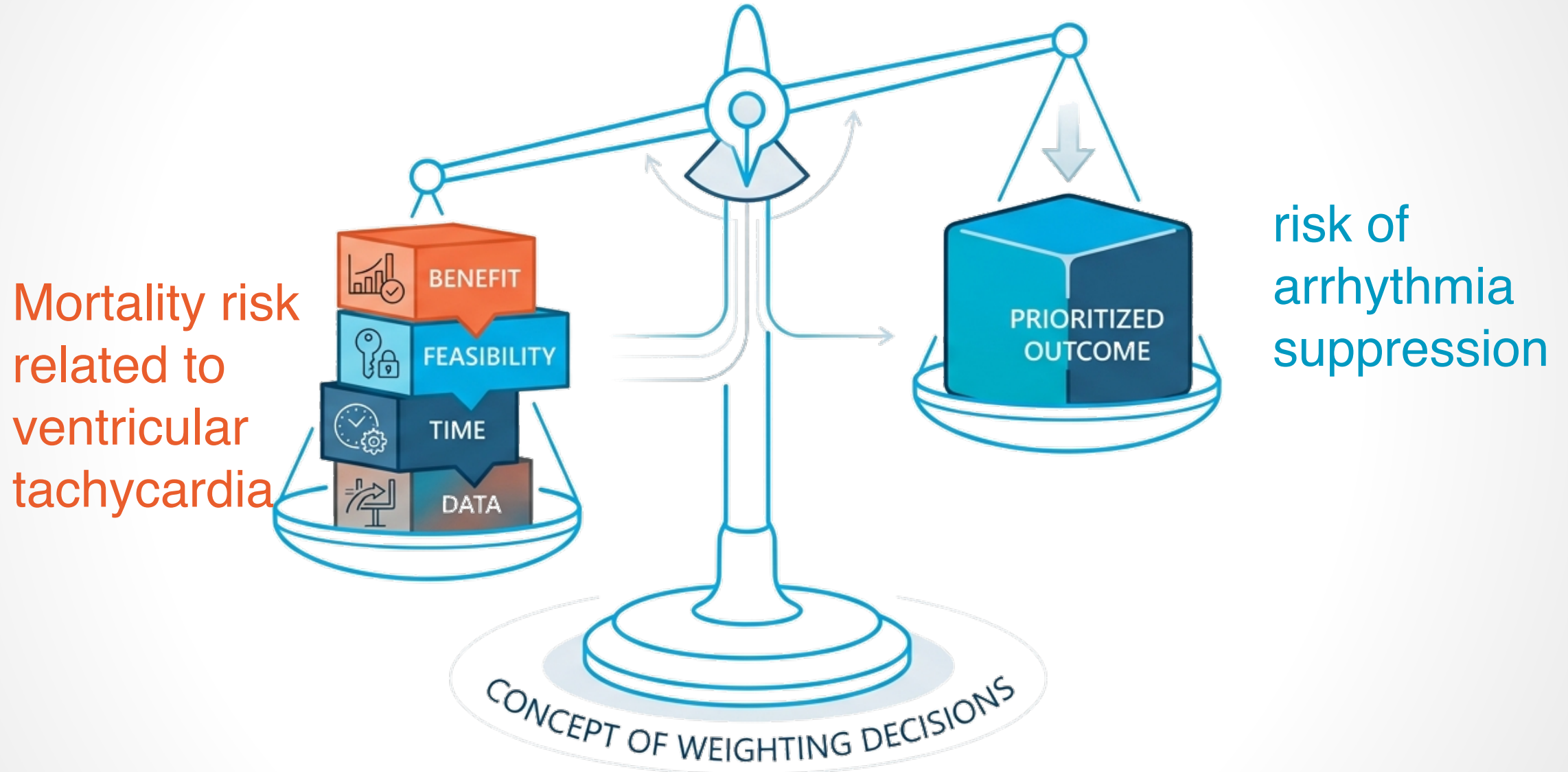
Cochran's Q: 3.23

P-value for Heterogeneity: 0.78

I² (Heterogeneity): 0%

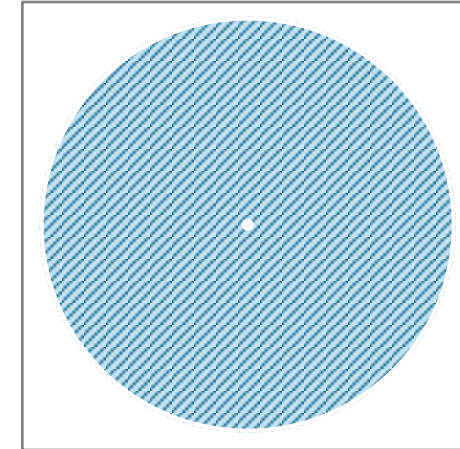
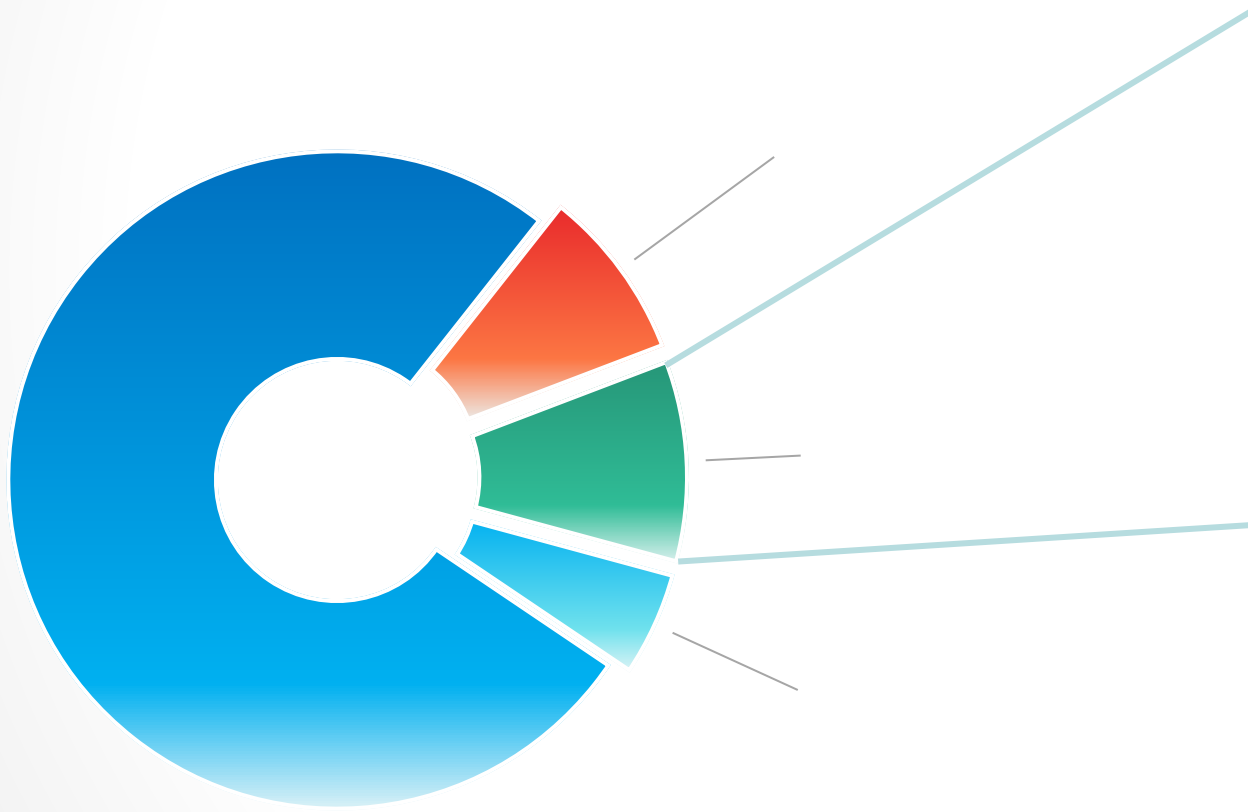


Calculating thresholds



The threshold at which the risk of arrhythmia suppression is offset by the risk of the ventricular tachycardia is not

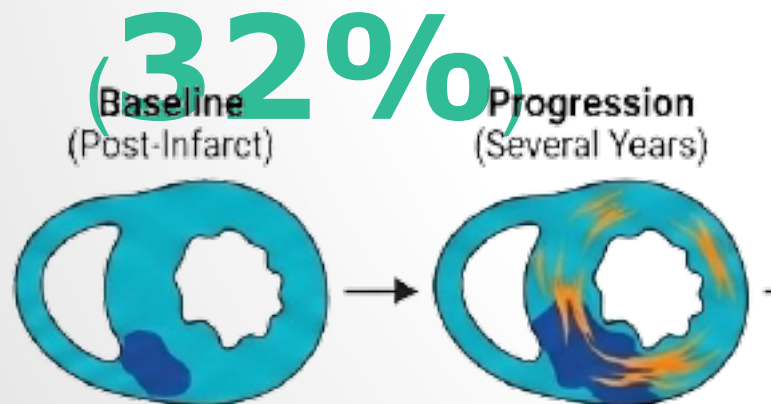
210 consecutive SHD patients who underwent repeat ablation for VT



21 consecutive SHD patients who underwent repeat ablation for VT

0
20
(**10%**) definite **recurrence** of previously ablated/
induced VT
(comparing the cycle length of the induced VT and 12-lead ECG (when available))

68



Progression of substrate (new areas
of low voltage and/or late potentials)
28 (41%) had ICM and 40 (59%) had NICM

380 patients

Catheter ablation

1:1
R

Cardiac

→ High-risk refractory VT, defined as:

- » Ischemic and/or nonischemic cardiomyopathy, and
- » Recurrent sustained monomorphic VT, defined as at least one of the following below, documented by ICD interrogation or ECG in the prior 6 months, and having occurred after the last VT ablation:
 - » A: **≥3** episodes of monomorphic VT treated with anti-tachycardia pacing (**ATP**) at least one of which is symptomatic
 - » B: **≥1 appropriate ICD shock**
 - » C: **ES** (≥3 episodes of sustained monomorphic VT within 24 hours treated with ICD shock or ATP)
 - » D: sustained **monomorphic VT below detection rate of ICD** documented by ECG, and LVEF≤49% and previously underwent at least one standard of care CA for VT.

21 consecutive SHD patients who underwent repeat ablation for VT

0

↪ **For patients receiving multiple therapies after the redo:**

- » LVAD implantation
- » 3rd ablation
- » sympathectomy/renal denervation
- » ICD upgrade
- » increase on antiarrhythmics
- » heart failure medication optimization & ICD reprogramming.

TACHICARDIE VENTRICOLARI

Recidiva di TV dopo ablazione: criteri clinici per reintervenire

Pasquale Vergara

**Advanced Cardiac Arrhythmia Program,
Head**



**Cardiologia
Federico II**



UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II