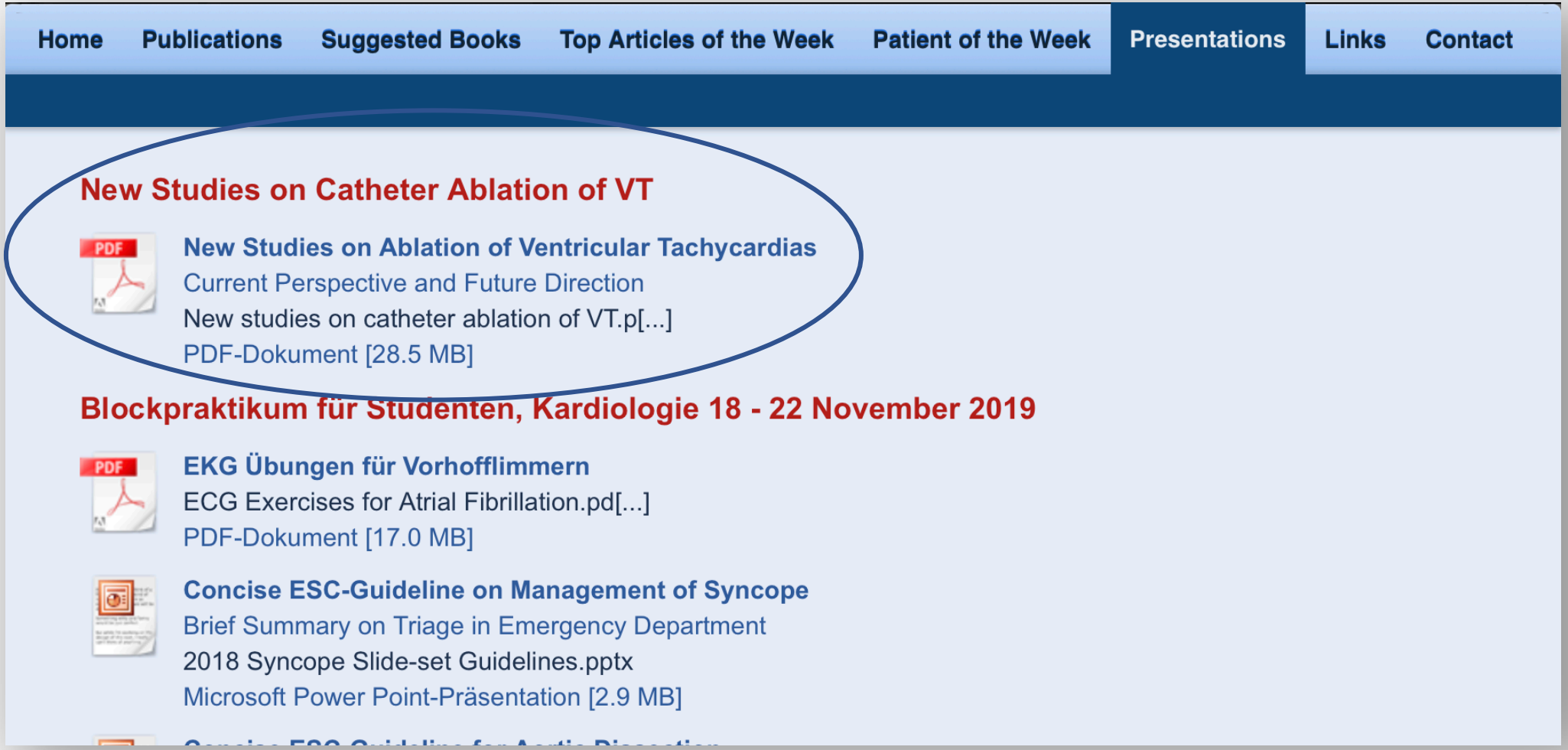
Catheter Ablation of VT

New Studies

Arash Arya

Disclosures:

NONE



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JAMA Cardiology | Original Investigation

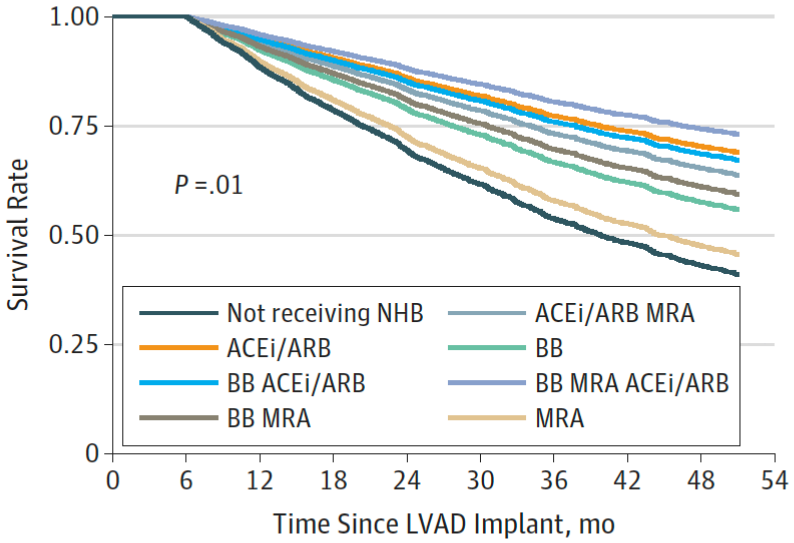
Neurohormonal Blockade and Clinical Outcomes in Patients With Heart Failure Supported by Left Ventricular Assist Devices

Megan McCullough, MD; Cesar Caraballo, MD; Neal G. Ravindra, MPhil; P. Elliott Miller, MD; Catherine Mezzacappa, MD, MPH; Andrew Levin, MD; Jadry Gruen, MD; Benjamin Rodwin, MD; Samuel Reinhardt, MD; David van Dijk, PhD; Ayyaz Ali, MD, PhD; Tariq Ahmad, MD, MPH; Nihar R. Desai, MD, MPH

Published online November 18, 2019

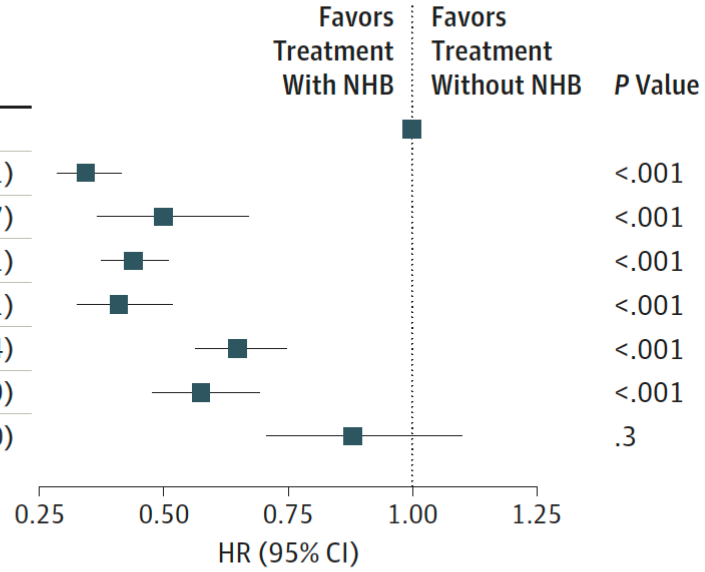
Figure 2. Sensitivity Analysis of Patients Receiving Varying Heart Failure Therapies

A Fully adjusted survival curves



B Time-varying, multivariate-adjusted Cox model

Therapy	HR (95% CI)	P Value
Not receiving NHB	1 [Reference]	
BB MRA ACEi/ARB	0.34 (0.28-0.41)	<.001
ACEi/ARB MRA	0.50 (0.37-0.67)	<.001
BB ACEi/ARB	0.44 (0.37-0.51)	<.001
ACEI/ARB	0.41 (0.32-0.51)	<.001
BB	0.65 (0.56-0.74)	<.001
BB MRA	0.57 (0.48-0.69)	<.001
MRA	0.88 (0.70-1.10)	.3



A, Fully adjusted survival curves accounting for time variation in patients' medications throughout the follow-up period. B, Forest plot for fully adjusted Cox proportional hazards regression model. ACEi indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blockers; BB, β-blockers; HR, hazard ratio; INTERMACS, Interagency Registry for Mechanically Assisted Circulatory Support; LVAD, left ventricular assist device; MRA, mineralocorticoid antagonists; NHB, neurohormonal blockade.

Überblick:

Ablation von Kammertachykardien

Aktuelle Studien

Eine Vision: die Zukunft

Catheter ablation of ventricular arrhythmias and in-hospital mortality: insights from the German-wide Helios hospital network of 5052 cases

Sebastian König [1,2]*, Laura Ueberham[1,2], René Müller-Röthing[2], Michael Wiedemann[3], Michael Ulbrich[4], Armin Sause [5], Jürgen Tebbenjohanns[6], Anja Schade[7], Dong-In Shin [8], Alexander Staudt[9], René Andrié[10], Hans Neuser[11], Ralf Kuhlen[12], Arash Arya[1], Gerhard Hindricks [1,2], and Andreas Bollmann[1,2]†

Europace. 2019. doi:10.1093/europace/euz260.

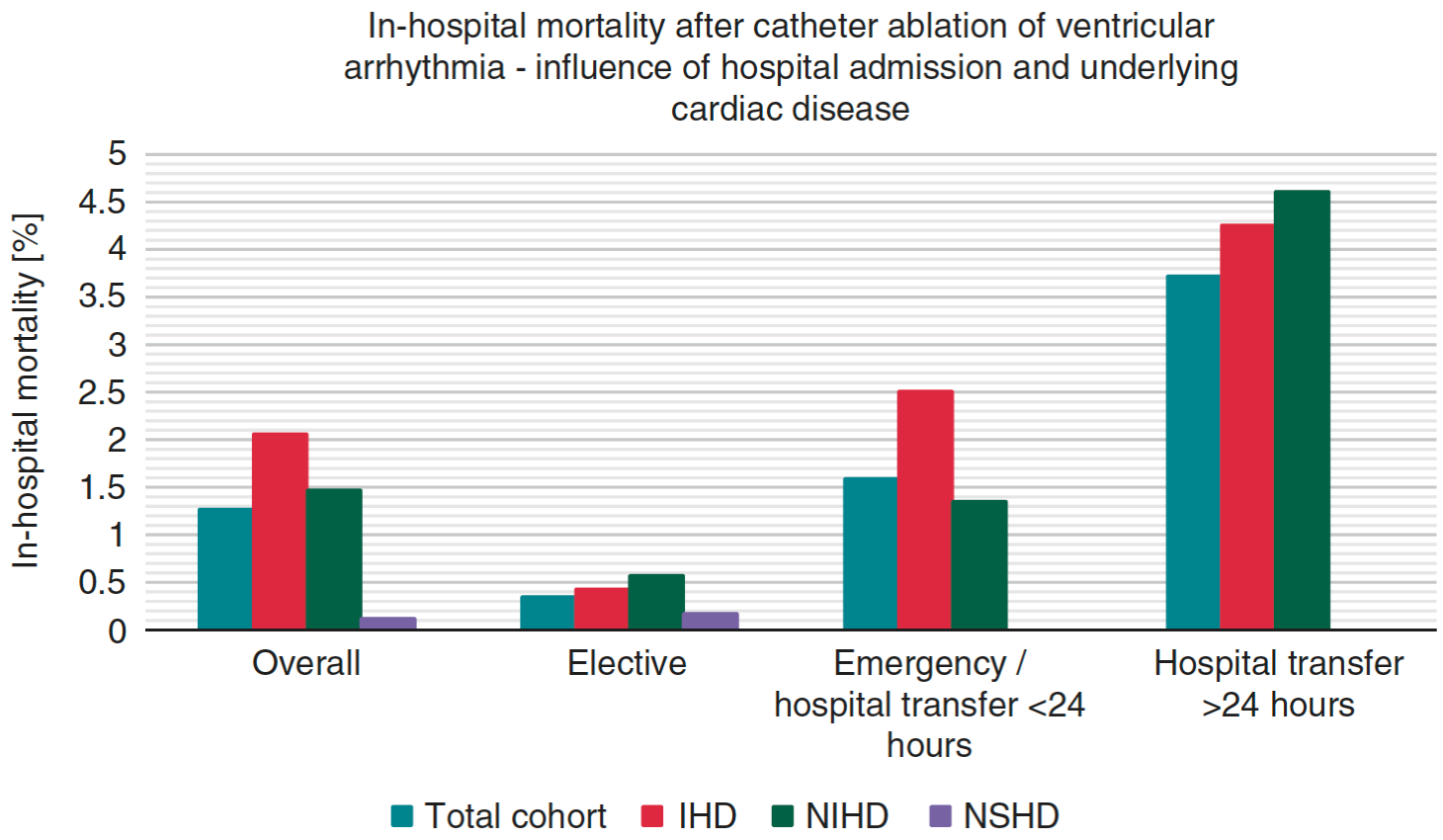


Figure 1 In-hospital mortality after catheter ablation of ventricular arrhythmia in the total study cohort and in the three subgroups of underlying cardiac diseases in dependence of different types of hospital admission. IHD, ischaemic heart disease; NIHD, non-ischaemic structural heart disease; NSHD, no overt structural heart disease.

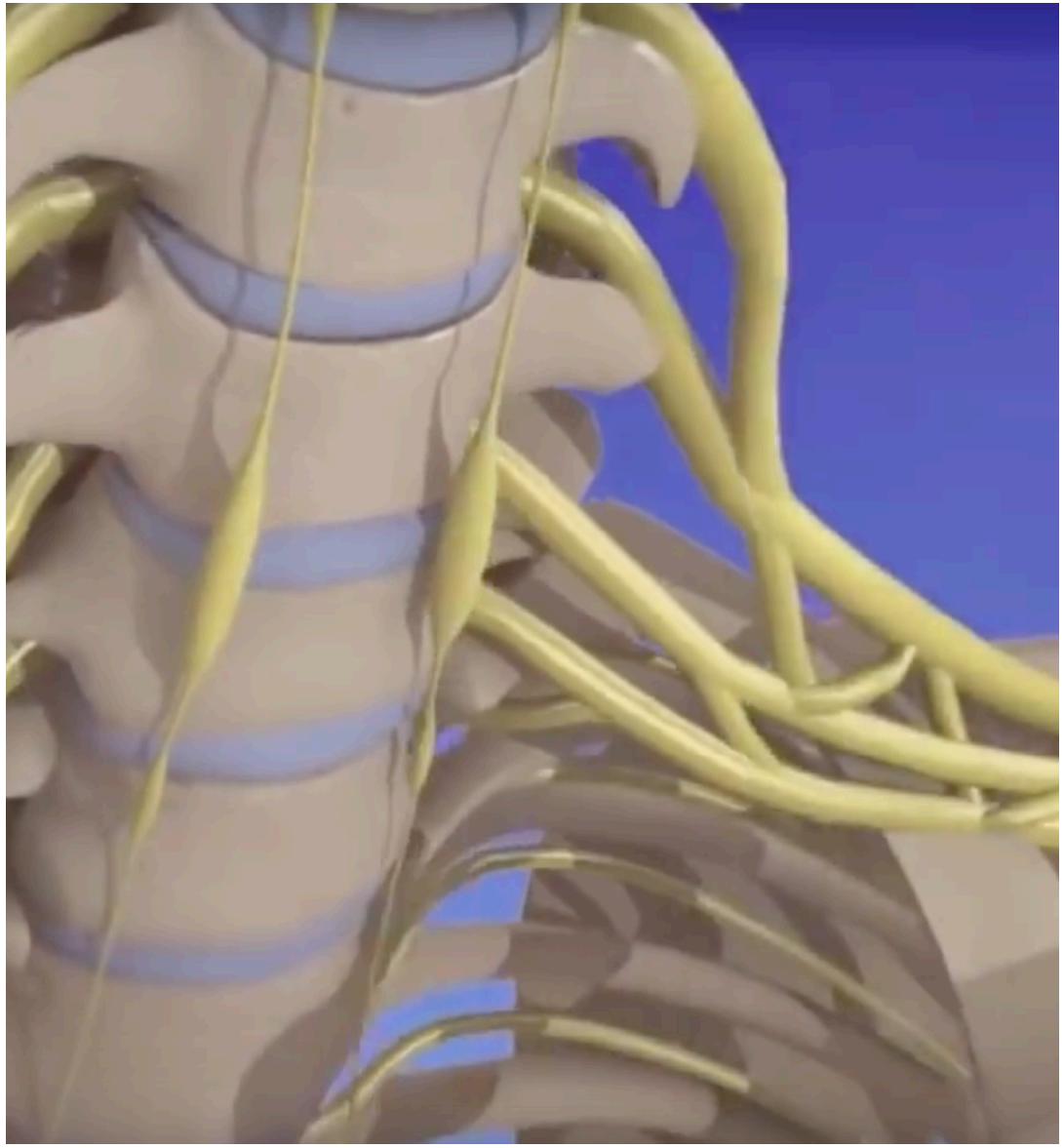
Circulation: Arrhythmia and Electrophysiology

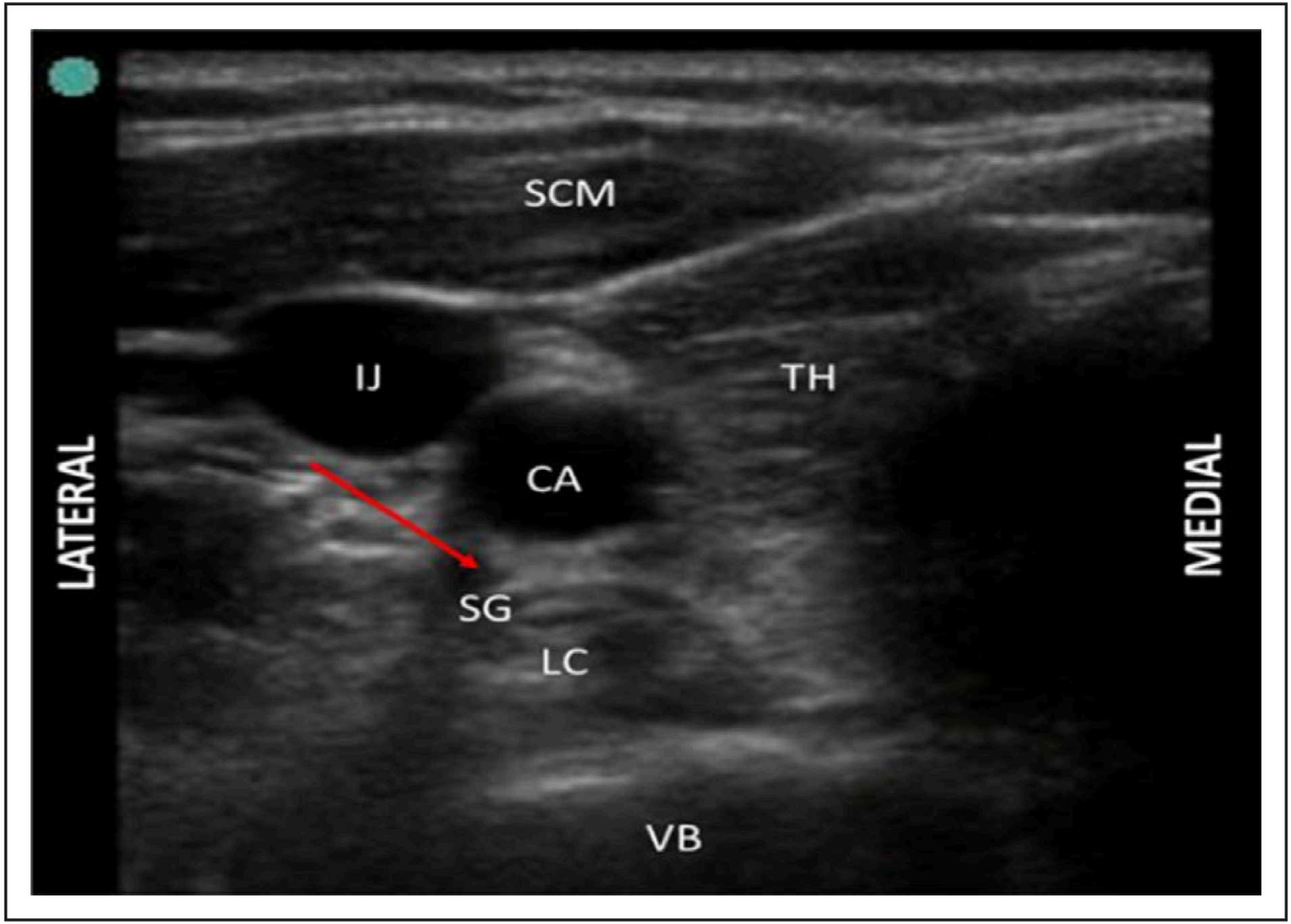
ORIGINAL ARTICLE

Effective Use of Percutaneous Stellate Ganglion Blockade in Patients With Electrical Storm

Circ Arrhythm Electrophysiol. 2019;12:e007118. DOI: 10.1161/CIRCEP.118.007118

This study included 30 consecutive patients who had drug-refractory electrical storm and underwent percutaneous SGB between October 1, 2013, and March 31, 2018.




SCM
IJ
TH
CA
LATERAL
MEDIAL
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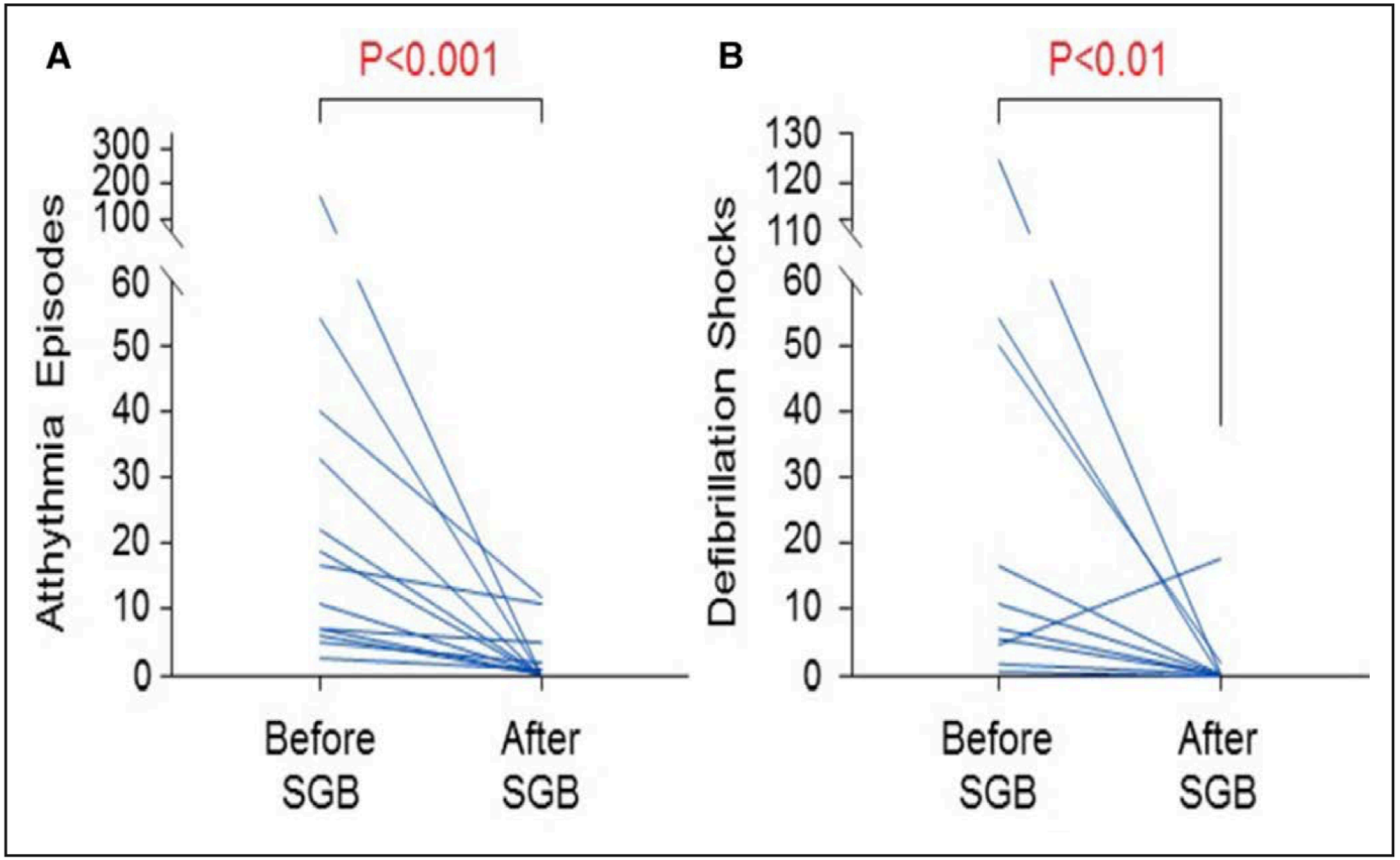


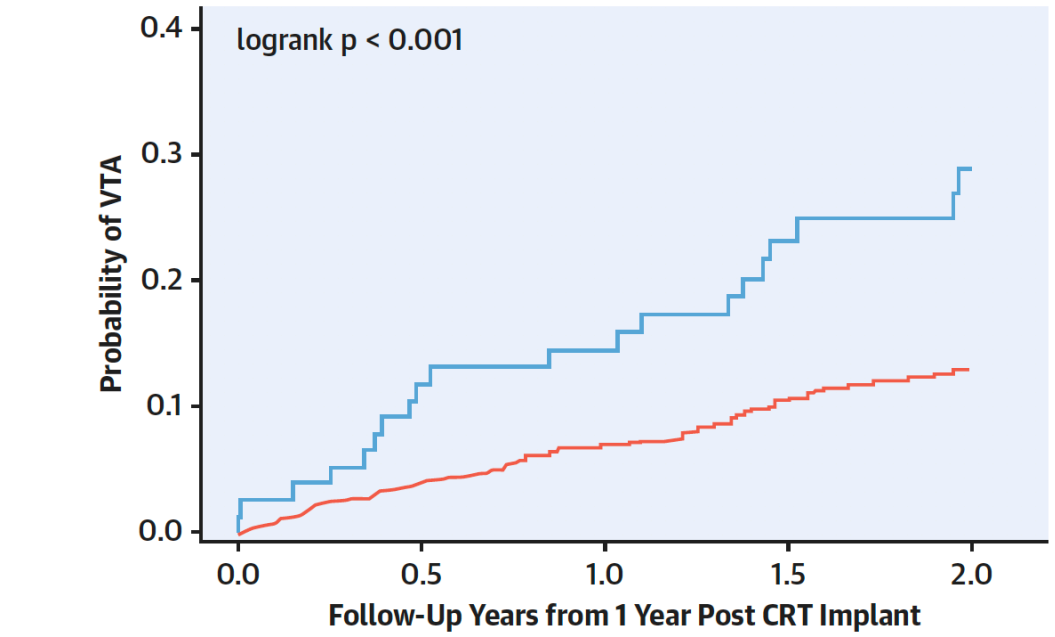
Figure 2. **Number of ventricular arrhythmia (VA) episodes and implantable cardioverter-defibrillator (ICD) shocks in patients with ICD before electrical storm.**

Risk of Ventricular Tachyarrhythmic Events in Patients Who Improved Beyond Guidelines for a Defibrillator in MADIT-CRT

Saadia Sherazi, MD, MS, Fatima Shah, Valentina Kutyifa, MD, PhD, Scott McNitt, MS, Mehmet K. Aktas, MD, Bronislava Polonsky, MS, Wojciech Zareba, MD, PhD, Ilan Goldenberg, MD

JACC EP: Published online November 2019

CENTRAL ILLUSTRATION Cumulative Probability of VTA in All Study Participants



Sherazi, S. et al. J Am Coll Cardiol EP. 2019;■(■):■-■.

CRT = cardiac resynchronization therapy; VTA = ventricular tachyarrhythmia.

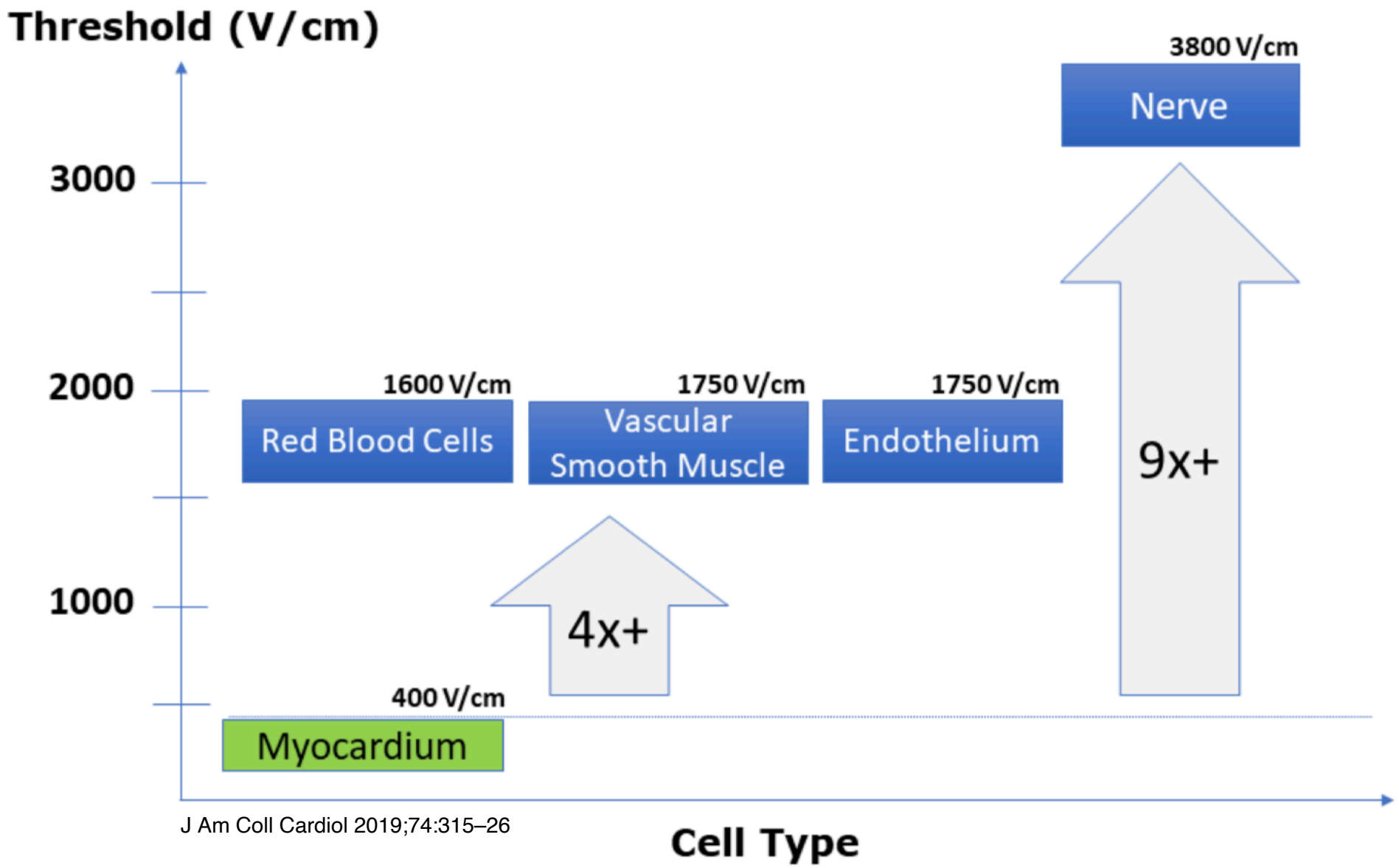
CONCLUSIONS AND CLINICAL IMPLICATIONS

A substantial risk of VTA remains in patients with LVEF improvement and functional class improvement beyond guidelines after CRT-D. These findings should be taken into consideration when informing patients about subsequent device selection (CRT-D vs. CRT-P) at the time of generator replacement.

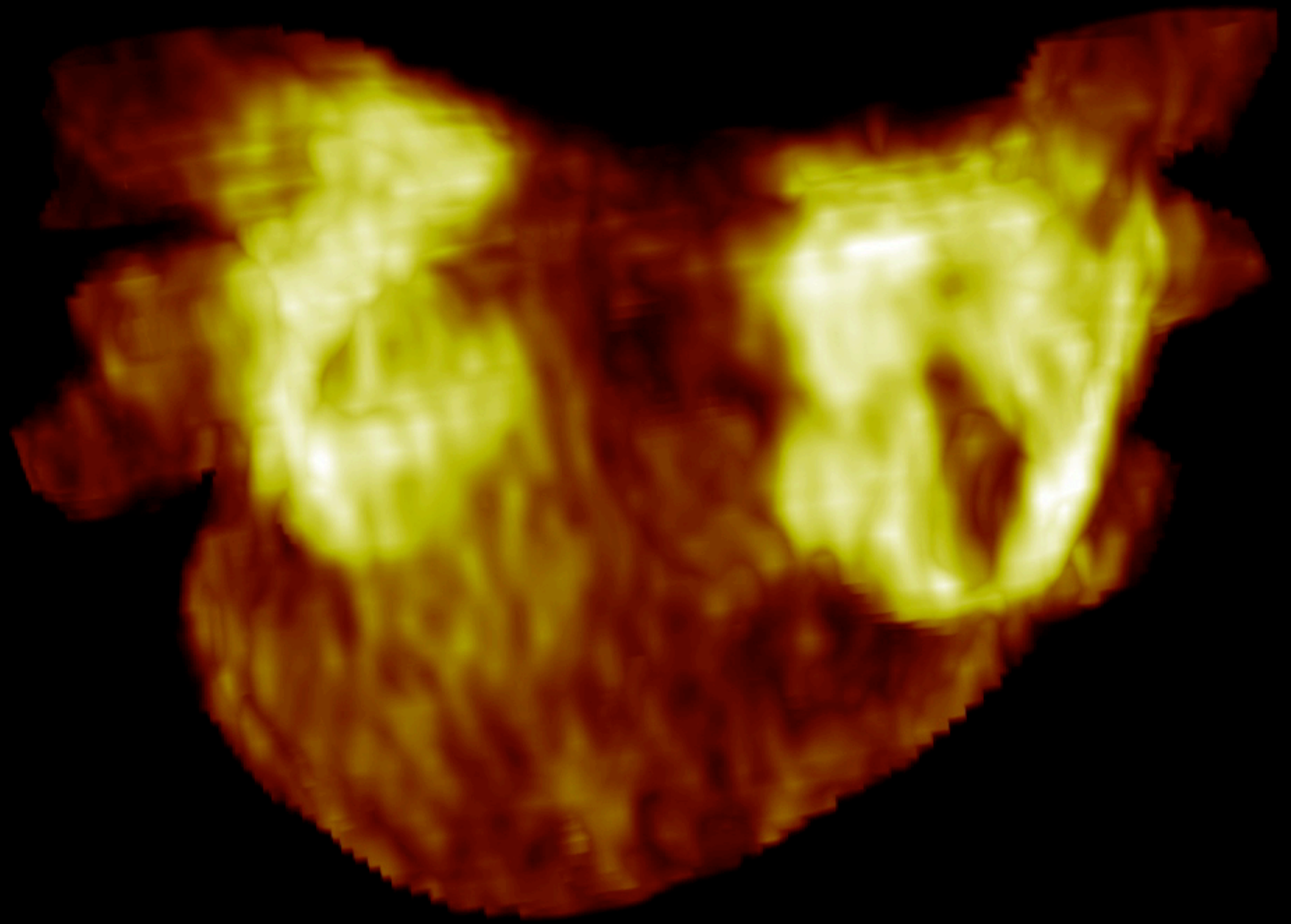
VT refractory to conventional Ablation:

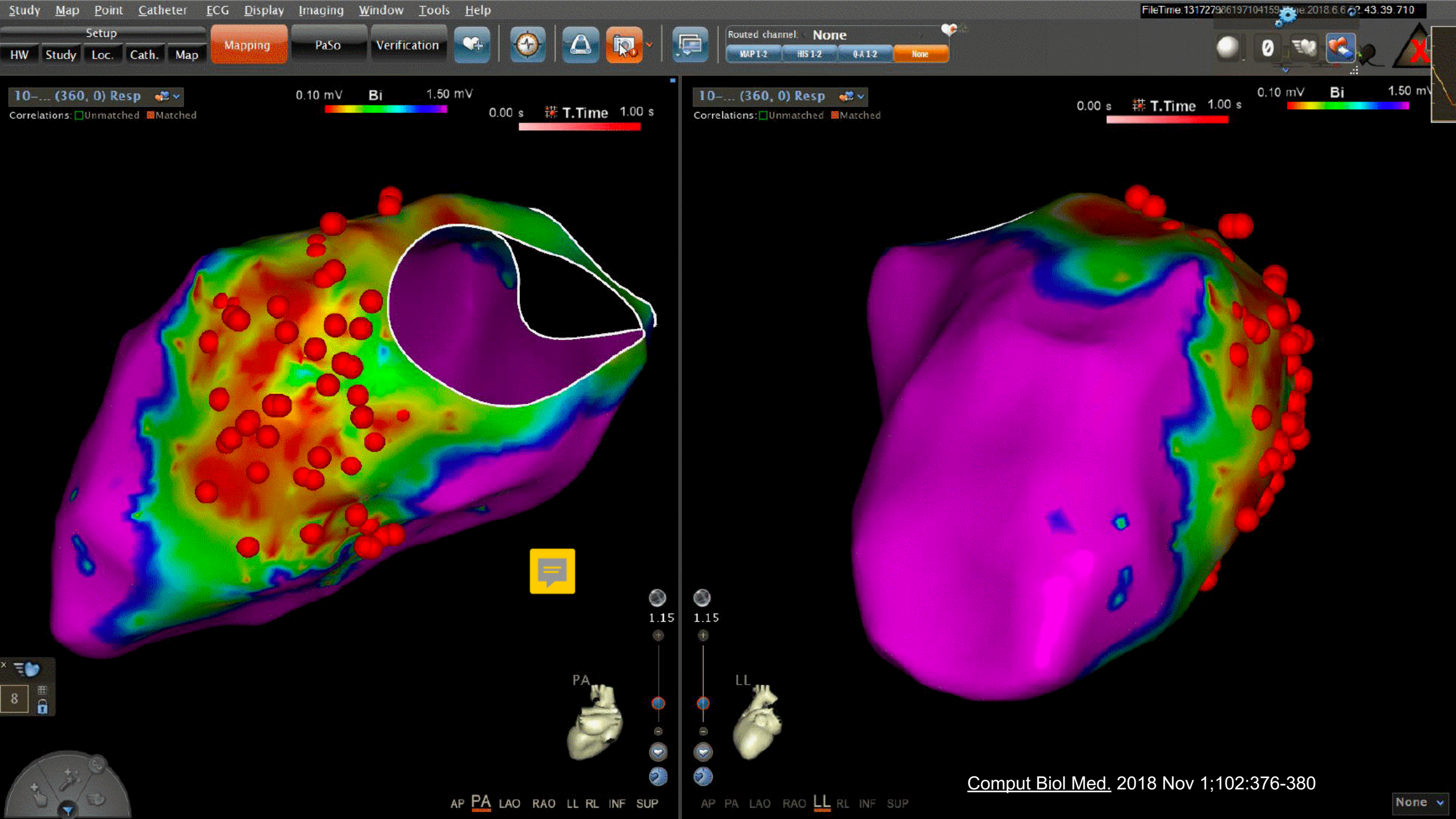
- Increase Power
- Change Catheter
- Using Half-Saline Irrigation
- Bipolar Ablation
- Alcohol Ablation
- Bilateral surgical sympathectomy
- Stereotactic Radio-Surgery
- Electroporation

Supplemental Figure S2: Thresholds of Various Cell Types to PFA

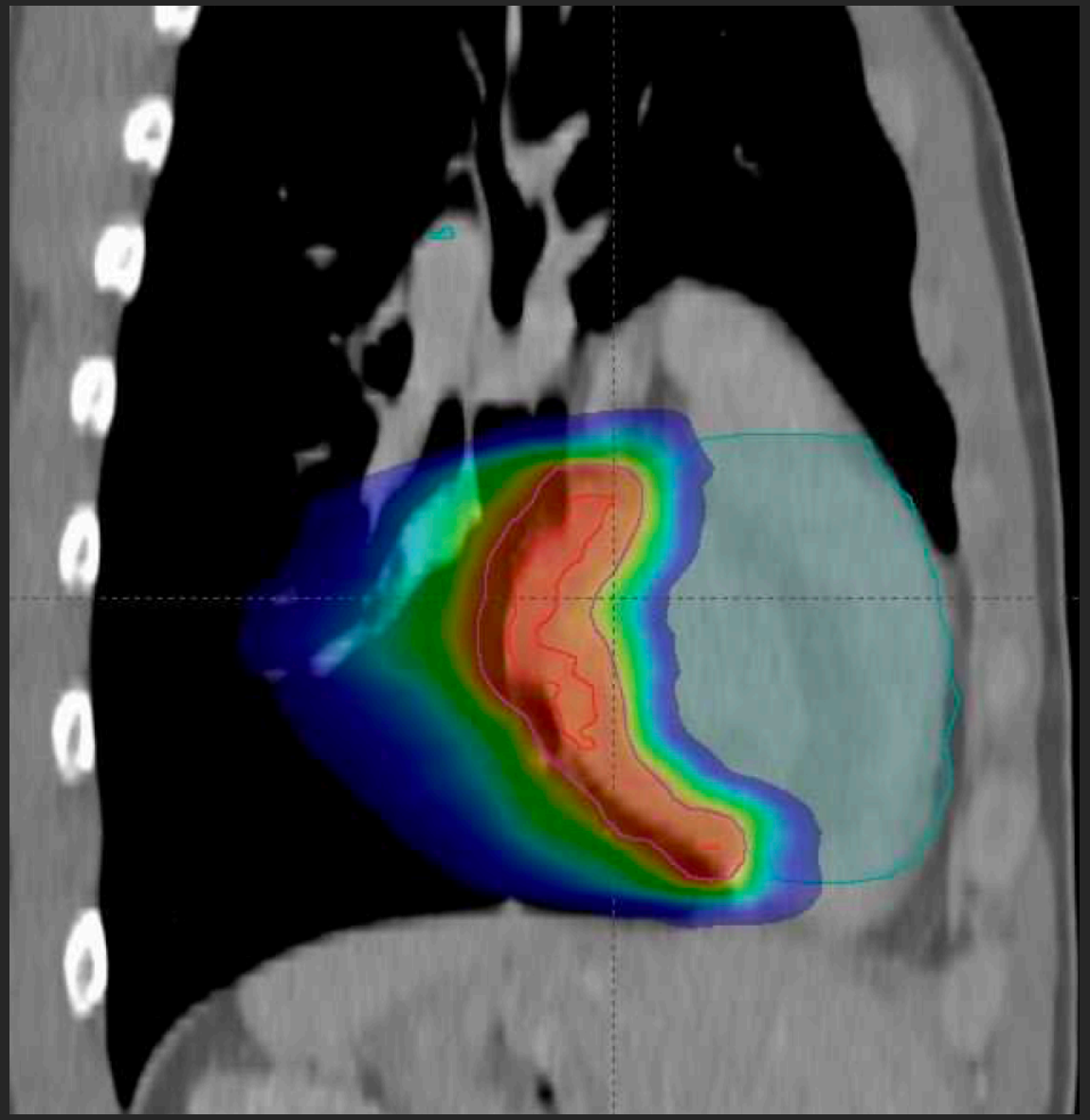


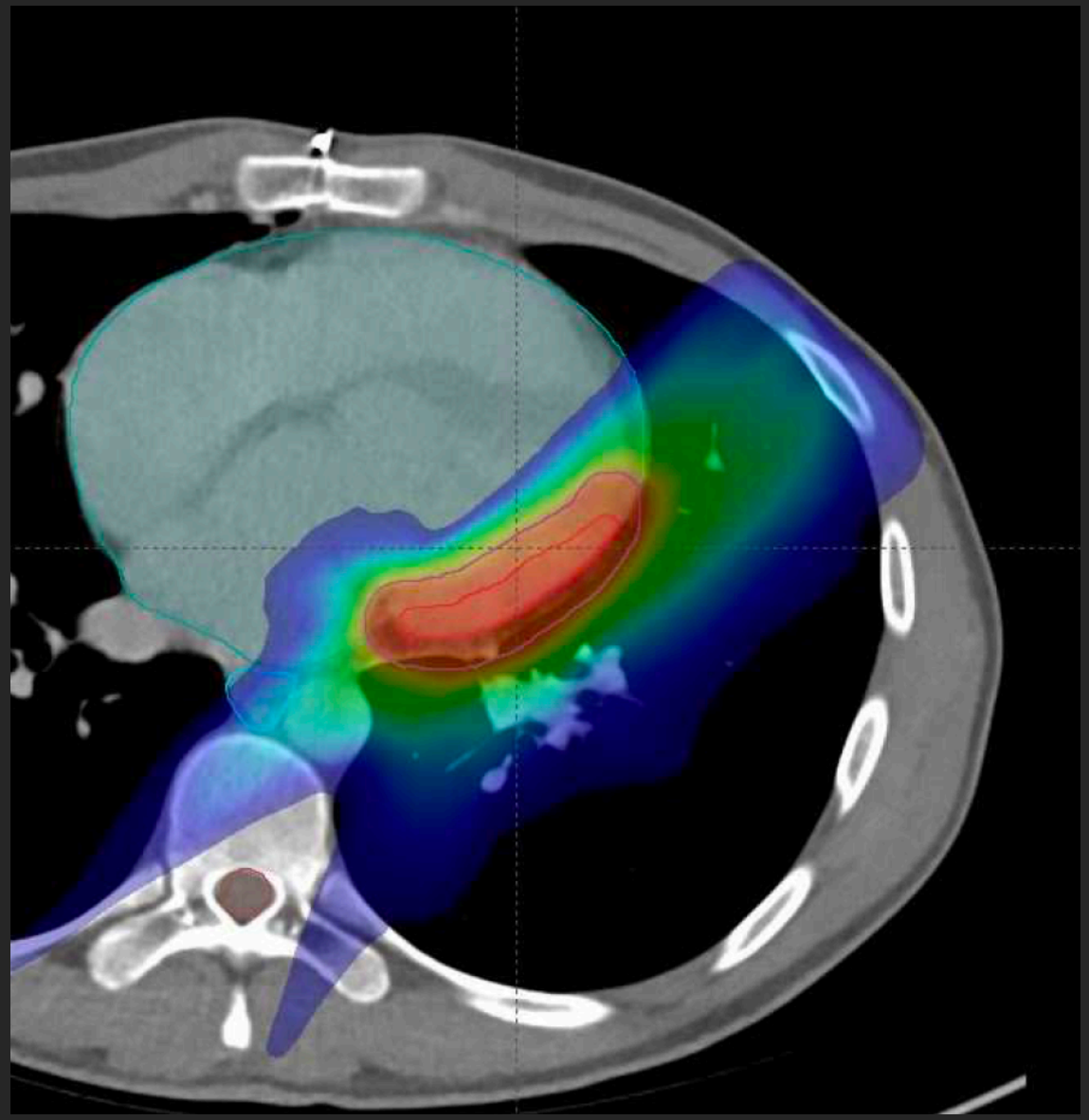
J Am Coll Cardiol 2019;74:315–26





Comput Biol Med. 2018 Nov 1;102:376-380





Comput Biol Med. 2018 Nov 1;102:376-380

ESC European Society of Cardiology

Europace (2019) **21**, 1088–1095
doi:10.1093/europace/euz133

CLINICAL RESEARCH
Ablation for ventricular tachycardia

Stereotactic radiosurgery for ablation of ventricular tachycardia

Radek Neuwirth[1], Jakub Cvek [2]*, Lukas Knybel[2], Otakar Jiravsky[3], Lukas Molenda[2], Michal Kodaj[3], Martin Fiala[1], Petr Peichl[4], David Feltl[5], Jaroslav Januška[3], Jan Hecko[3], and Josef Kautzner[4]

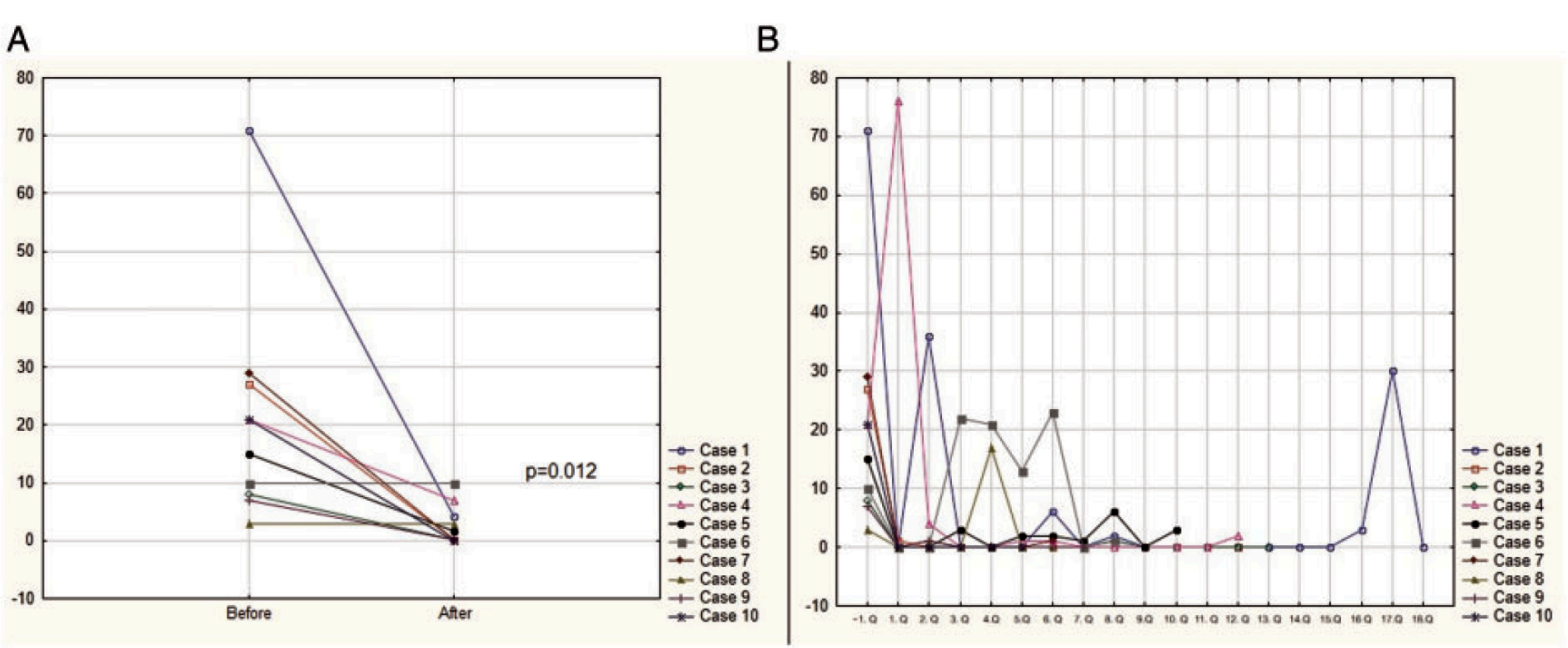
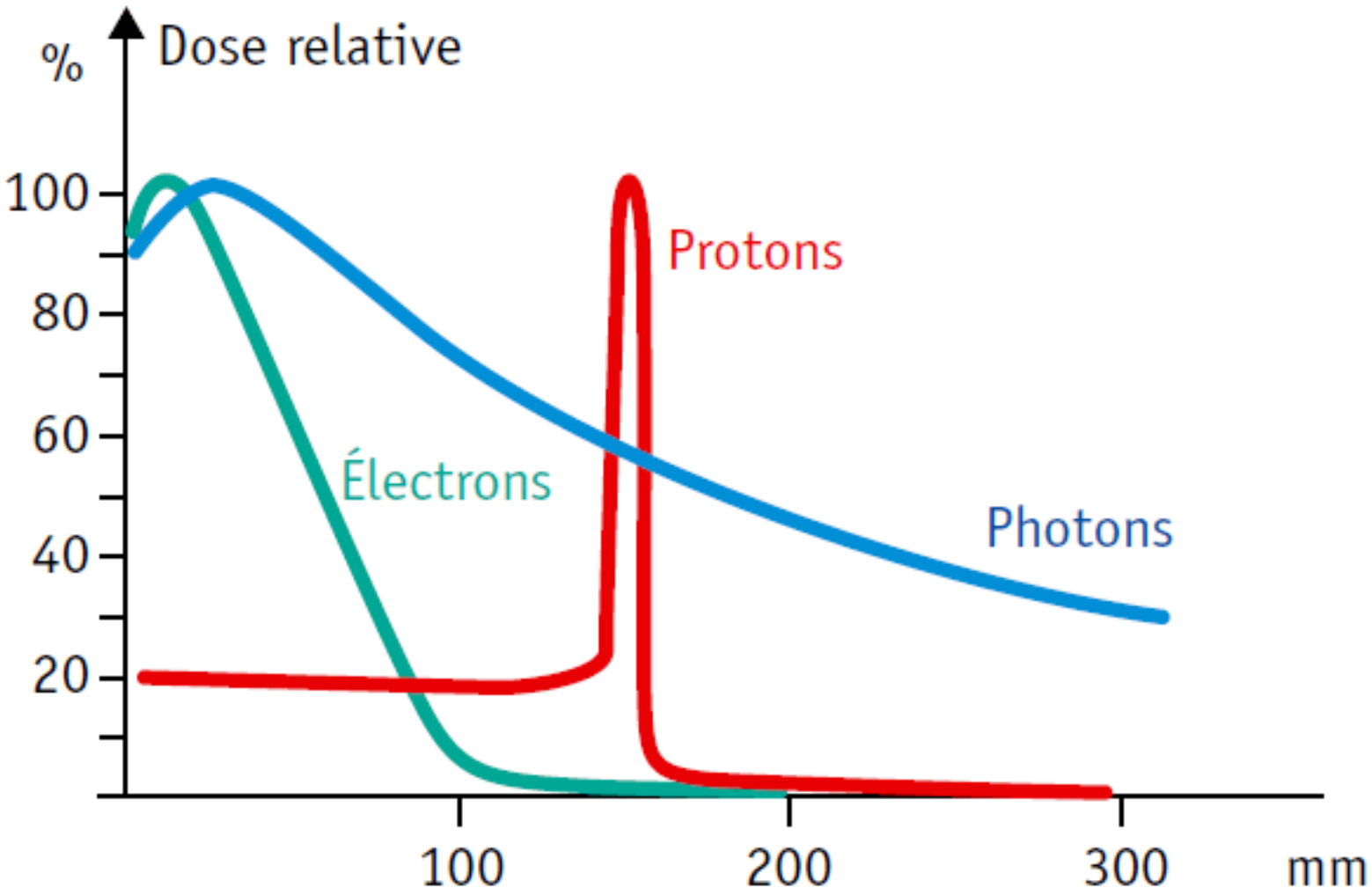
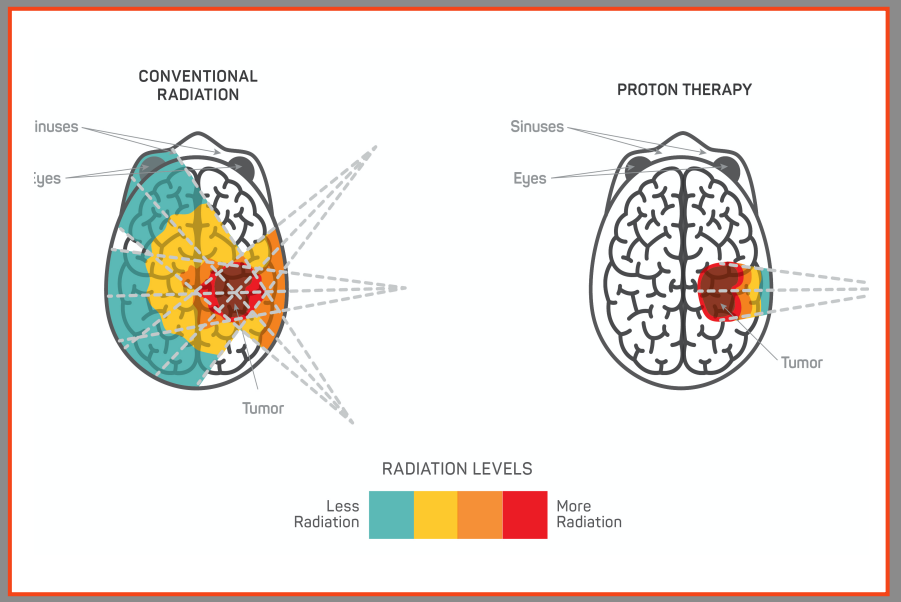
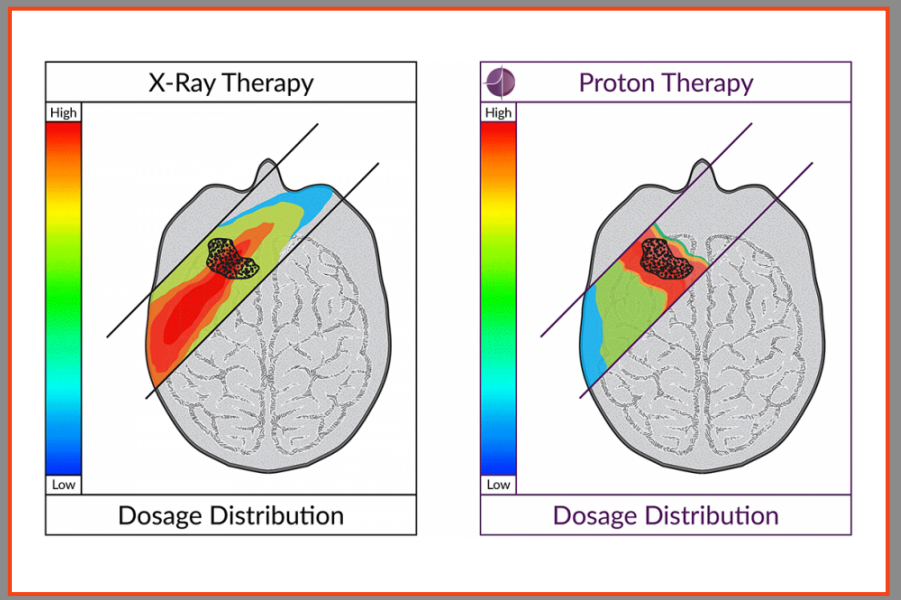
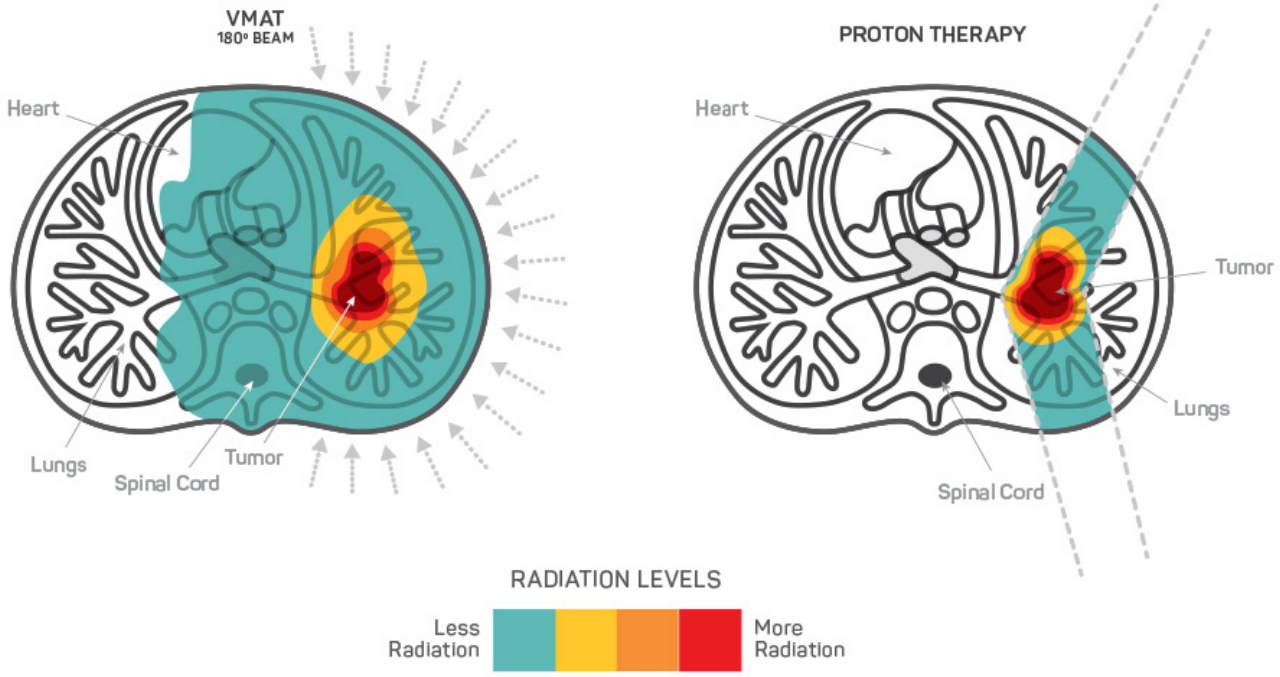


Figure 1 Reduction of sustained VT before and after treatment. (*A*) Significant reduction of sustained VT after radiosurgery is shown. (*B*) The total number of episodes of sustained VT in each of the 10 study patients, for three consecutive months before treatment (−1.Q) and continuing for 3 months periods after treatment (1.Q–18.Q) is shown. VT, ventricular tachycardia.


%
Dose relative
100
80
60
40
20
Protons
Électrons
Photons
100
200
300
mm


CONVENTIONAL RADIATION
inuses
yes
Tumor
PROTON THERAPY
Sinuses
Eyes
Tumor
RADIATION LEVELS
Less Radiation
More Radiation


X-Ray Therapy
High
Low
Dosage Distribution
Proton Therapy
High
Low
Dosage Distribution


VMAT
180° BEAM
Heart
Lungs
Spinal Cord
Tumor
PROTON THERAPY
Heart
Tumor
Lungs
Spinal Cord
RADIATION LEVELS
Less Radiation
More Radiation

Left ventricular function after noninvasive cardiac ablation using proton beam therapy in a porcine model

Stephan Hohmann, MD,* Amanda J. Deisher, PhD,† Atsushi Suzuki, MD, PhD,* Hiroki Konishi, MD, PhD,* Maryam E. Rettmann, PhD,* Kenneth W. Merrell, MD,† Jon J. Kruse, PhD,† Laura K. Newman, CVT,* Kay D. Parker, CVT,* Kristi H. Monahan, RN,* Robert L. Foote, MD,† Michael G. Herman, PhD,† Douglas L. Packer, MD, FHRS*

Heart Rhythm 2019;16:1710–1719

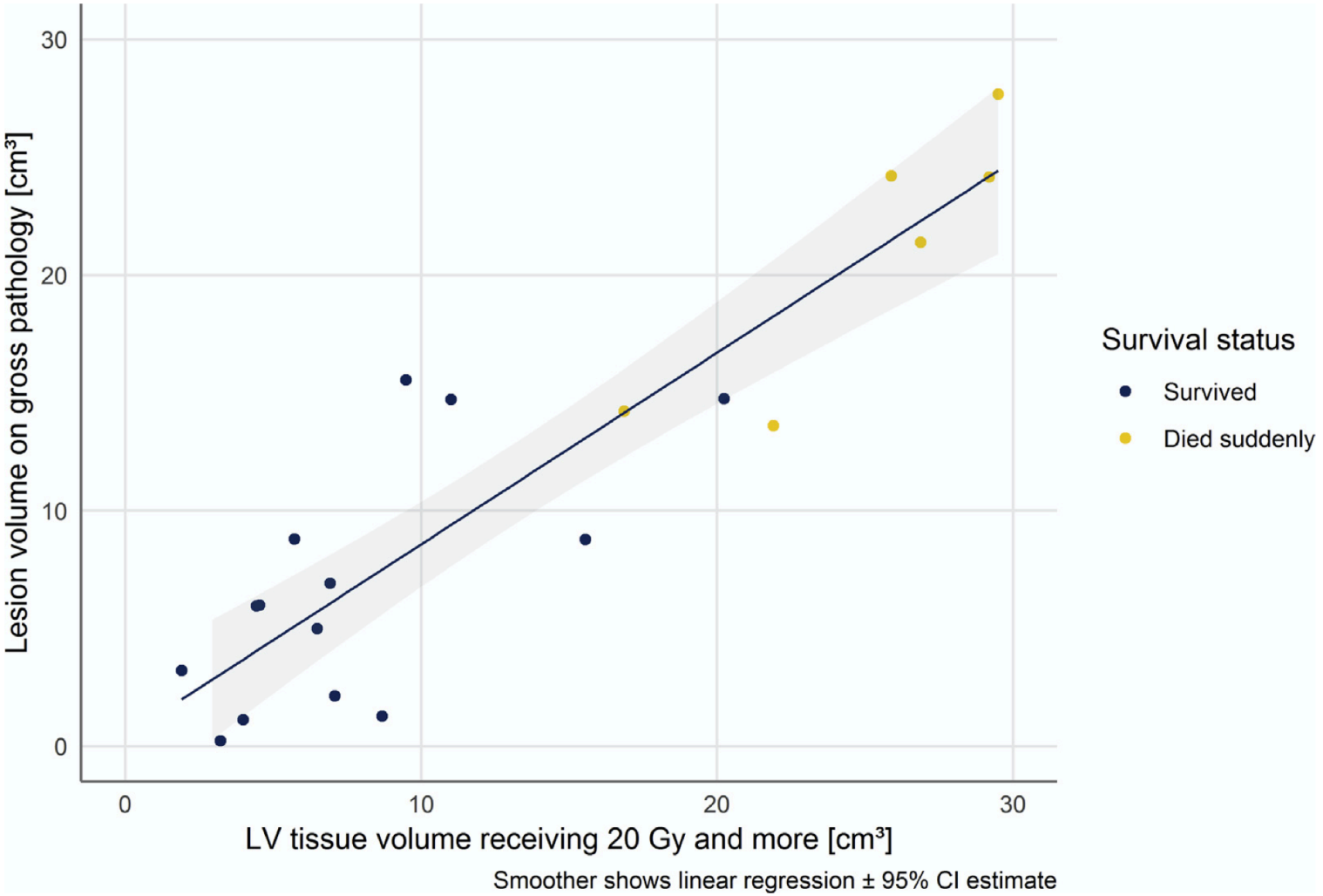


Figure 2 Correlation between volume receiving at least 20 Gy and the measured lesion size on gross pathology. Animal growth during follow-up and tissue deformation in the postmortem state affected lesion size on gross pathology. *Orange points* indicate animals that died suddenly. LV = left ventricle.

Heart Rhythm 2019;16:1710–1719

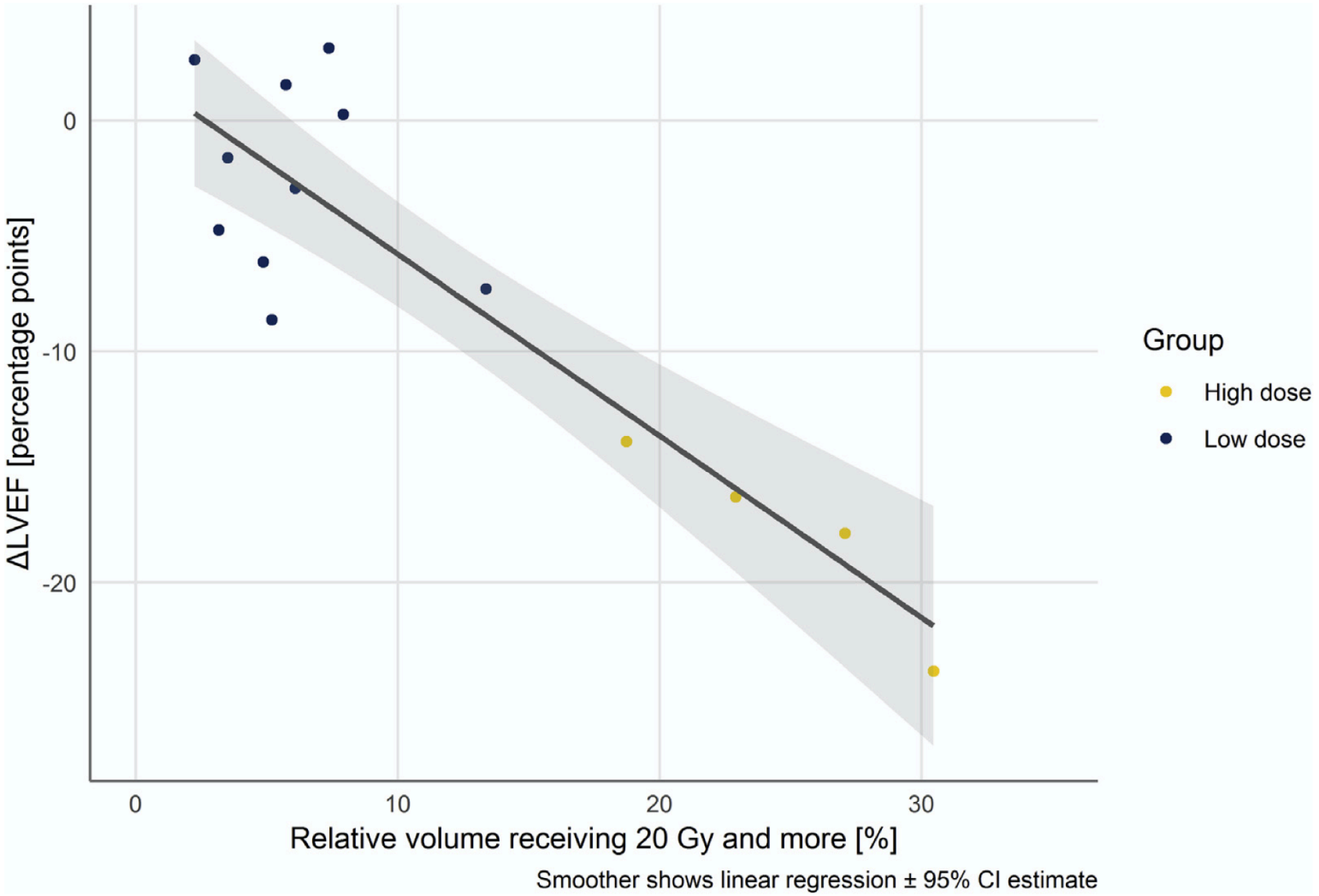
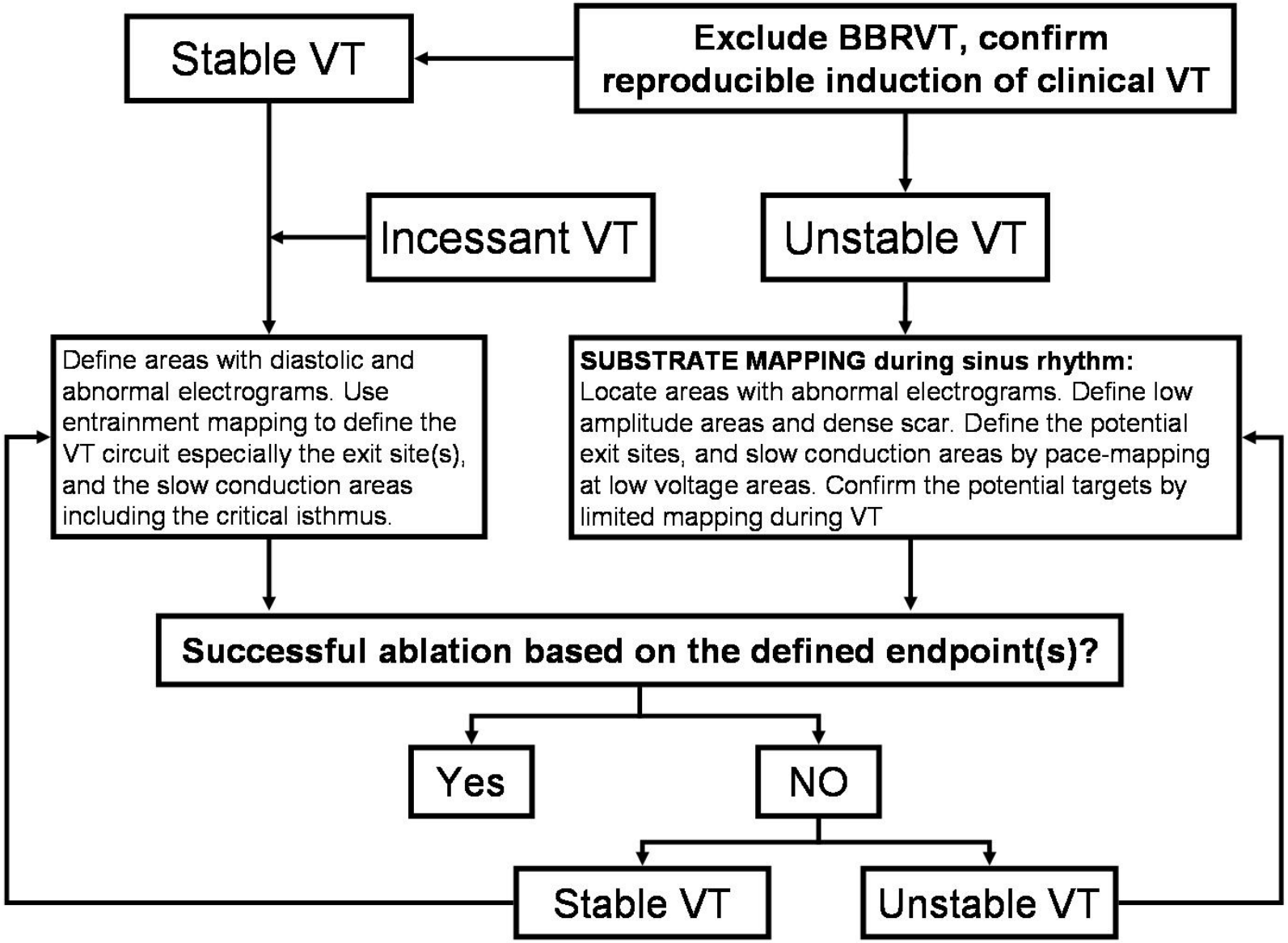


Figure 6 Change in left ventricular ejection fraction (LVEF) in relation to the myocardial volume receiving at least 20 Gy.

Heart Rhythm 2019;16:1710–1719

Die Zukunft der VT-Ablation

VT Ablation

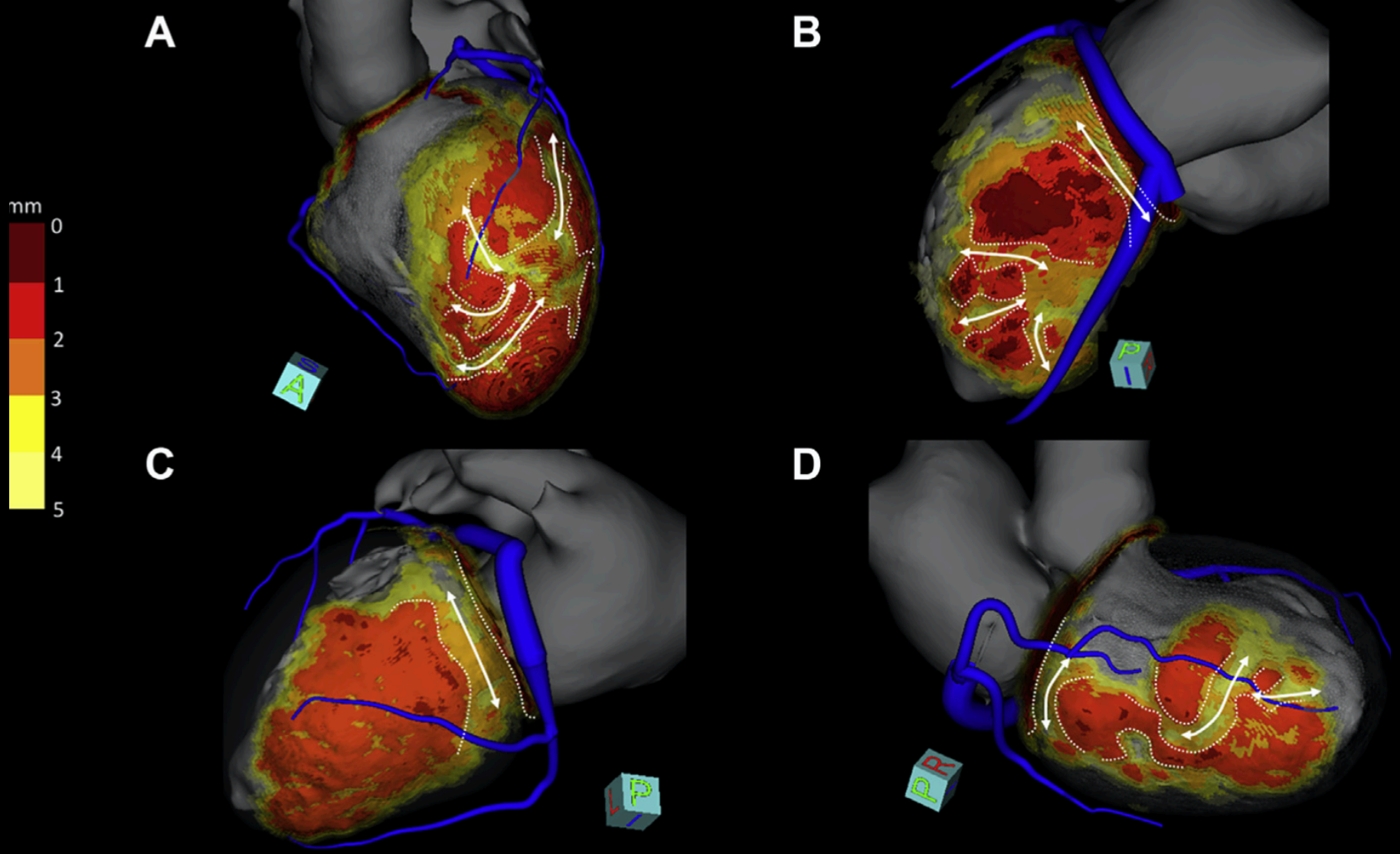


Arya A et al. In Cardiac Mapping, 2nd Edition.

Are wall thickness channels defined by computed tomography predictive of isthmuses of postinfarction ventricular tachycardia?

Masateru Takigawa, MD,*† Josselin Duchateau, MD,* Frederic Sacher, MD,* Ruairidh Martin, MD,*‡ Konstantinos Vlachos, MD,* Takeshi Kitamura, MD,* Maxime Sermesant, PhD,§ Nicolas Cedilnik, PhD,§ Ghassen Cheniti, MD,* Antonio Frontera, MD,* Nathaniel Thompson, MD,* Calire Martin, MD,* Gregoire Massoullie, MD,* Felix Bourier, MD,* Anna Lam, MD,* Michael Wolf, MD,* William Escande, MD,* Clémentine André, MD,* Thomas Pambrun, MD,* Arnaud Denis, MD,* Nicolas Derval, MD,* Meleze Hocini, MD,* Michel Haissaguerre, MD,* Hubert Cochet, MD,* Pierre Jaïs, MD*

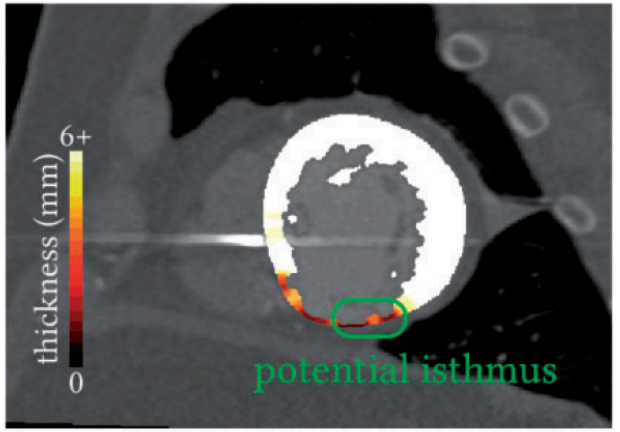
Heart Rhythm 2019;16:1661–1668

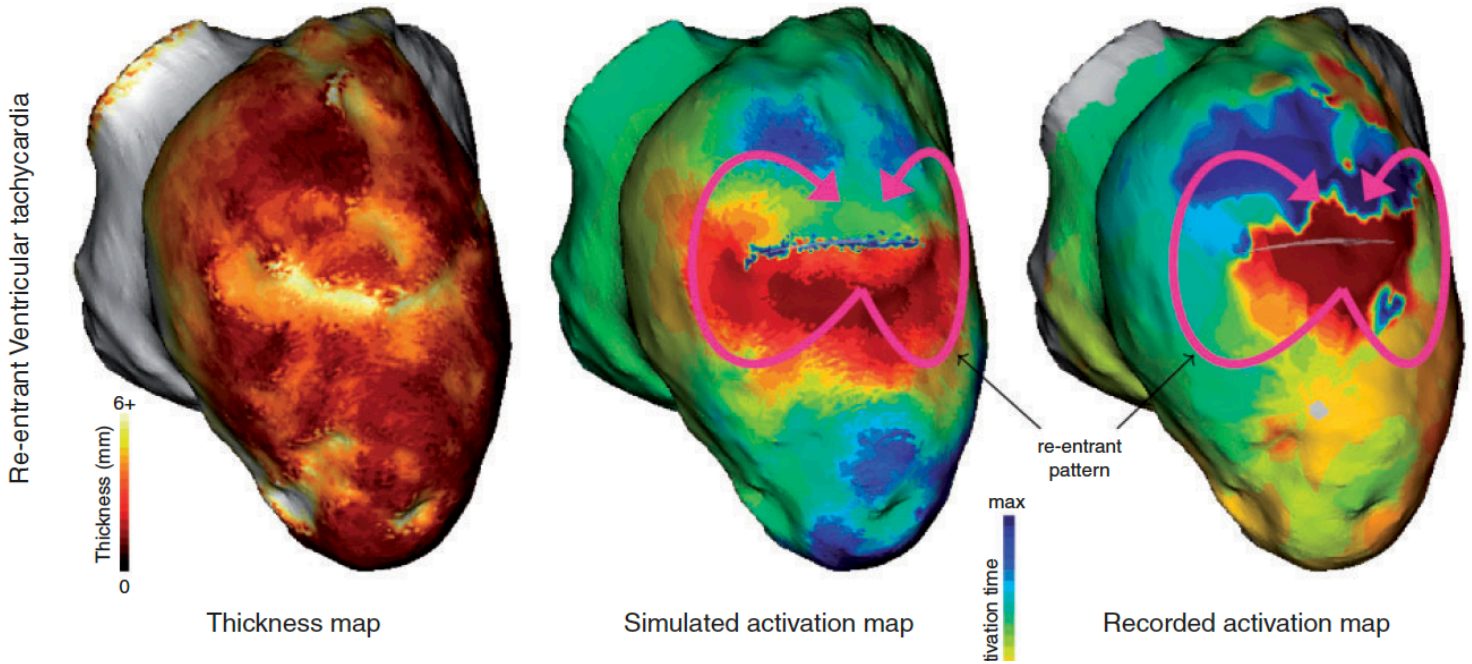


CONCLUSION: VT isthmuses were always found in CT channels (100% sensitivity), and half of CT channels hosted VT isthmuses (positive predictive value 51%). Longer and thinner (but .1 mm) CT channels were significantly associated with VT isthmuses.

Fast personalized electrophysiological models from computed tomography images for ventricular tachycardia ablation planning

The authors aim at building such a pipeline from computed tomography (CT) images to personalized cardiac electrophysiology (EP) model.



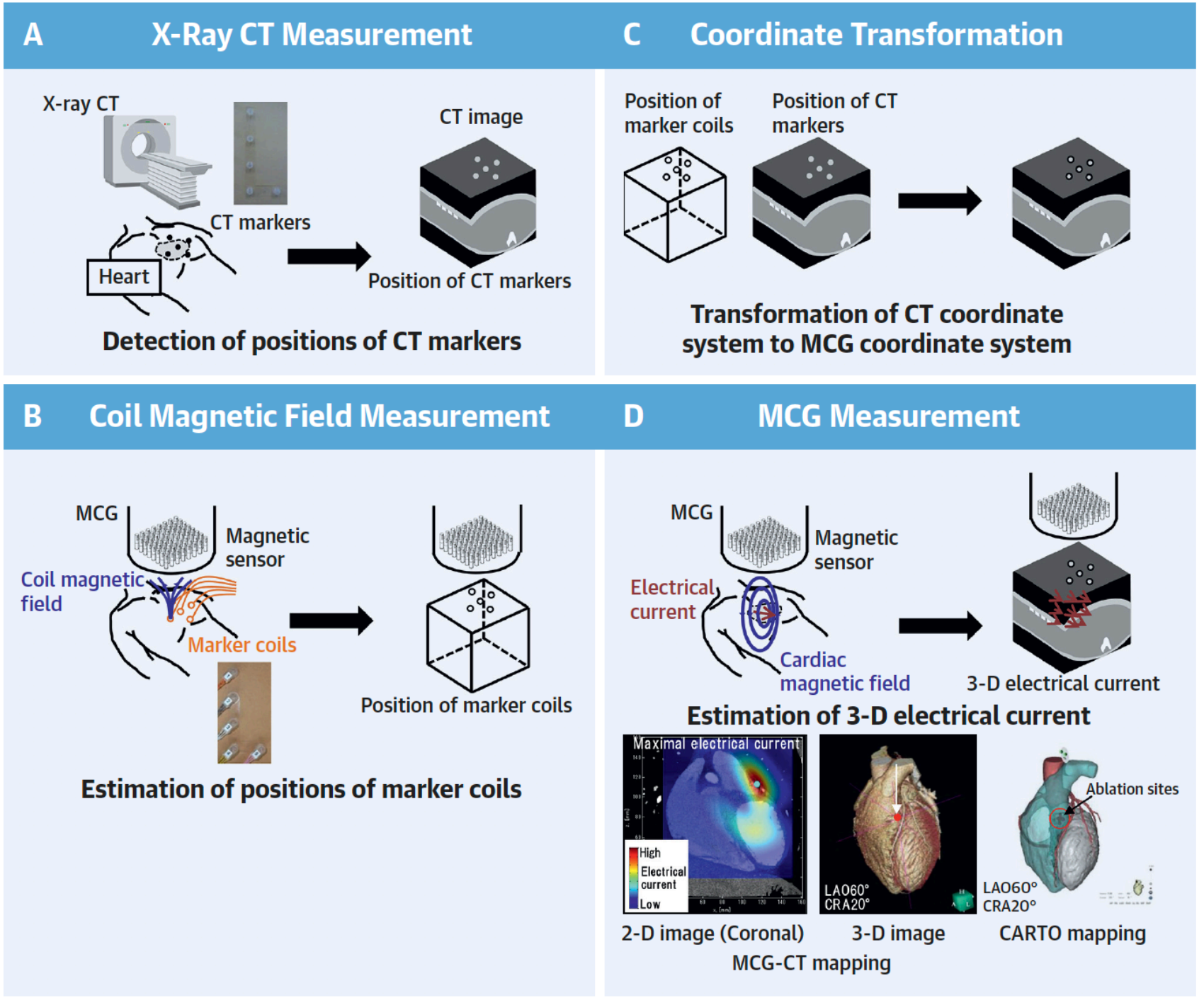


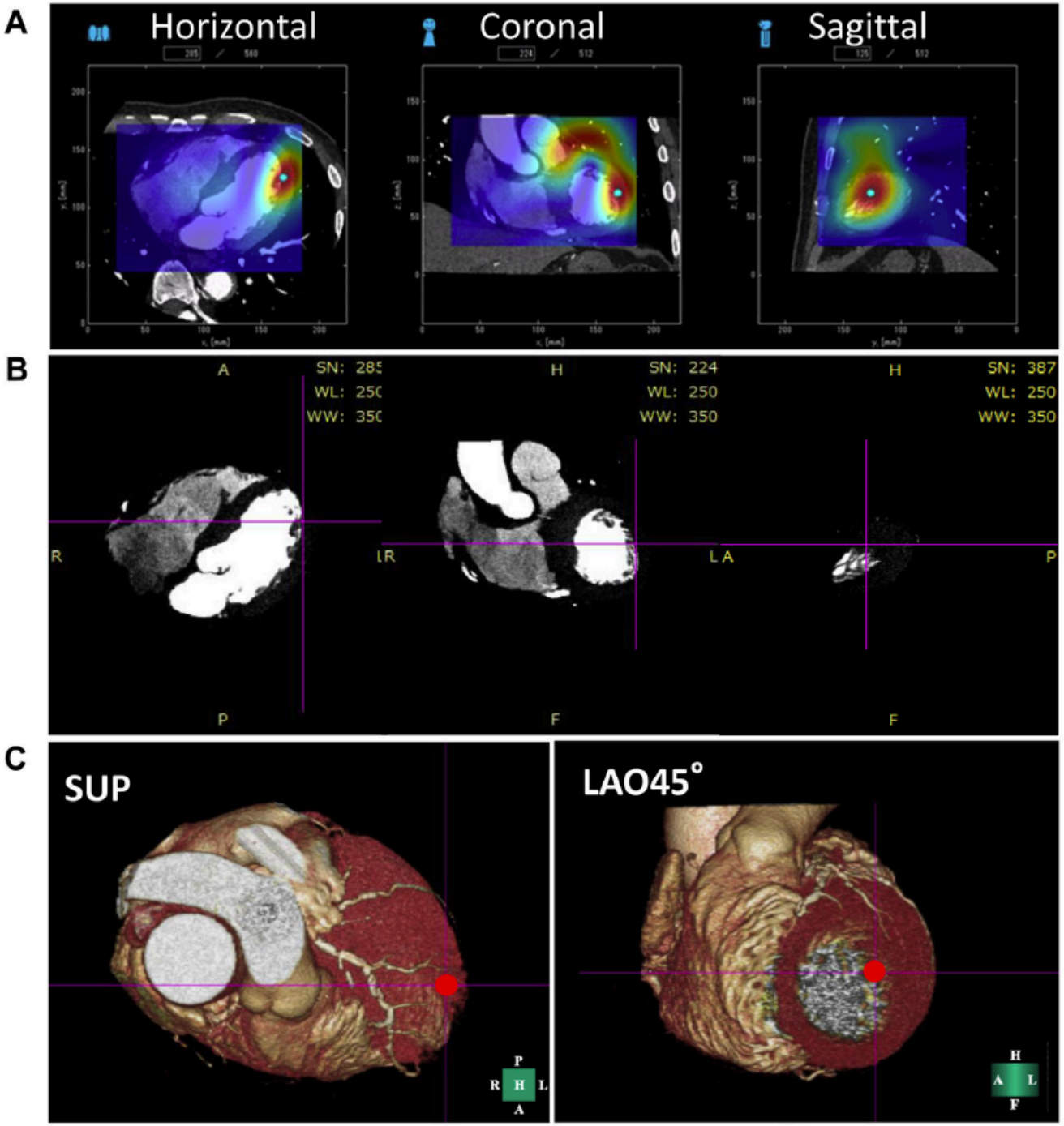
Nicolas Cedilnik et al. Europace (2019) In Press.

Noninvasive Mapping of Premature Ventricular Contractions by Merging Magnetocardiography and Computed Tomography

Satoshi Aita, MD,[a,*] Kuniomi Ogata, MENG,[c,*] Kentaro Yoshida, MD,[a,b] Takeshi Inaba, RDCS,[a] Hisanori Kosuge, MD,[a,d] Takeshi Machino, MD,[a] Yasuaki Tsumagari, MD,[a] Ai Hattori, MD,[a] Yoko Ito, MD,[a] Yuki Komatsu, MD,[a] Kensuke Sekihara, PHD,[e] Hitoshi Horigome, MD,[f] Kazutaka Aonuma, MD,[a] Akihiko Nogami, MD,[a] Akihiko Kandori, PHD,[c,†] Masaki Ieda, MD[a,†]

JACC EP 2019;5(10):1144-1157


A
X-Ray CT Measurement
X-ray CT
CT markers
Heart
CT image
Position of CT markers
Detection of positions of CT markers
C
Coordinate Transformation
Position of marker coils
Position of CT markers
Transformation of CT coordinate system to MCG coordinate system
B
Coil Magnetic Field Measurement
MCG
Magnetic sensor
Coil magnetic field
Marker coils
Position of marker coils
Estimation of positions of marker coils
D
MCG Measurement
MCG
Magnetic sensor
Electrical current
Cardiac magnetic field
3-D electrical current
Estimation of 3-D electrical current
Maximal electrical current
High
Electrical current
Low
LAO60°
CRA20°
Ablation sites
LAO60°
CRA20°
2-D image (Coronal)
3-D image
CARTO mapping
MCG-CT mapping


A
Horizontal
Coronal
Sagittal
B
A
H
H
SN: 285
WL: 250
WW: 350
SN: 224
WL: 250
WW: 350
SN: 387
WL: 250
WW: 350
R
L R
L A
P
P
F
F
C
SUP
LAO45°
P
R H L
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H
A L
F
D
SUP
LAO45°

künstliche Intelligenz

An artificial intelligence-enabled ECG algorithm for the identification of patients with atrial fibrillation during sinus rhythm: a retrospective analysis of outcome prediction

Zachi I Attia, Peter A Noseworthy*, Francisco Lopez-Jimenez, Samuel J Asirvatham, Abhishek J Deshmukh, Bernard J Gersh, Rickey E Carter, Xiaoxi Yao, Alejandro A Rabinstein, Brad J Erickson, Suraj Kapa, Paul A Friedman*

LANCET: http://dx.doi.org/10.1016/S0140-6736(19)31721-0

… Including all ECGs acquired during the first month of each patient's window of interest (i.e., the study start date or 31 days before the first recorded atrial fibrillation ECG) increased the AUC to 0·90 (0·90–0·91), sensitivity to 82·3% (80·9–83·6), specificity to 83·4% (83·0–83·8), F1 score to 45·4% (44·2–46·5), and overall accuracy to 83·3% (83·0–83·7).

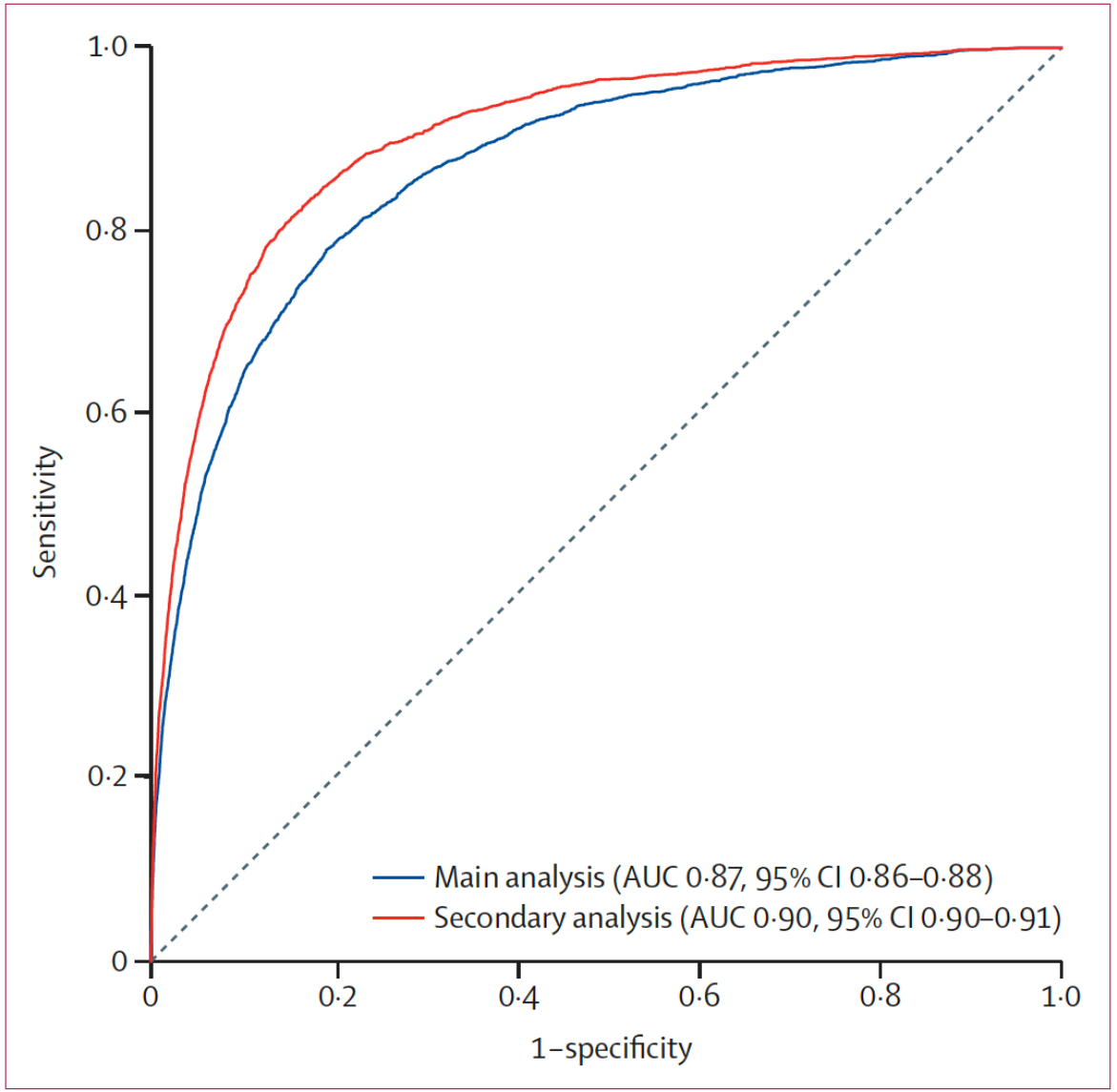


Figure 3: **ROC curves for the convolutional neural networks on the testing dataset**

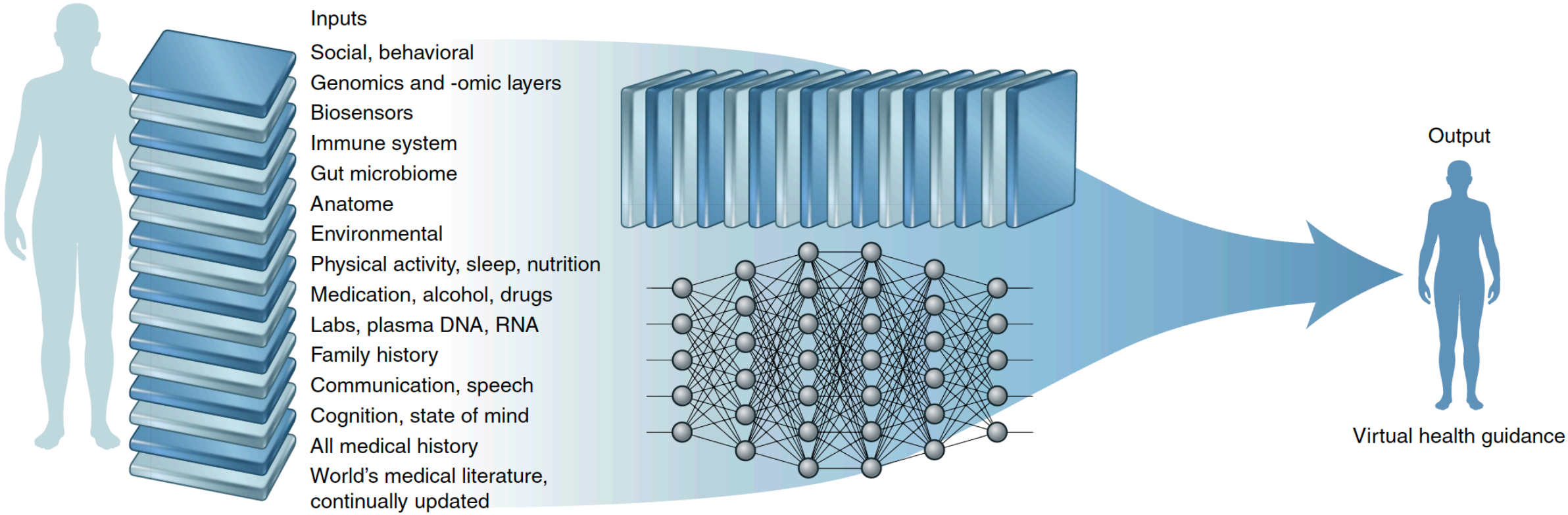


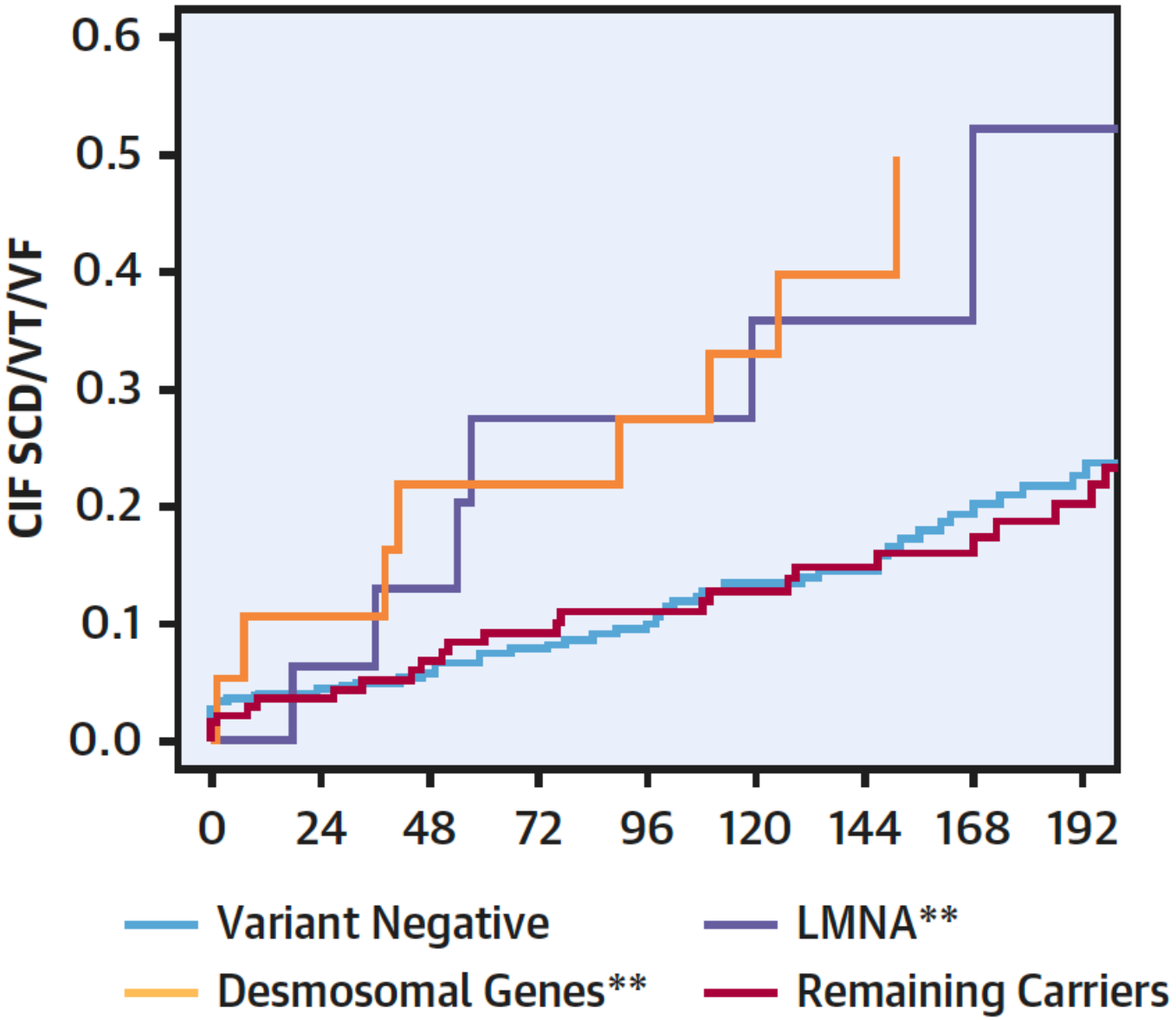
Fig. 3 | The virtual medical coach model with multi-modal data inputs and algorithms to provide individualized guidance. A virtual medical coach that uses comprehensive input from an individual that is deep learned to provide recommendations for preserving the person's health. Credit: Debbie Maizels/ Springer Nature

Nature Medicine **volume 25**, pages44–56 (2019)

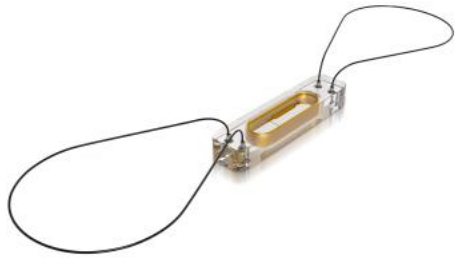
Genetic Risk of Arrhythmic Phenotypes in Patients With Dilated Cardiomyopathy

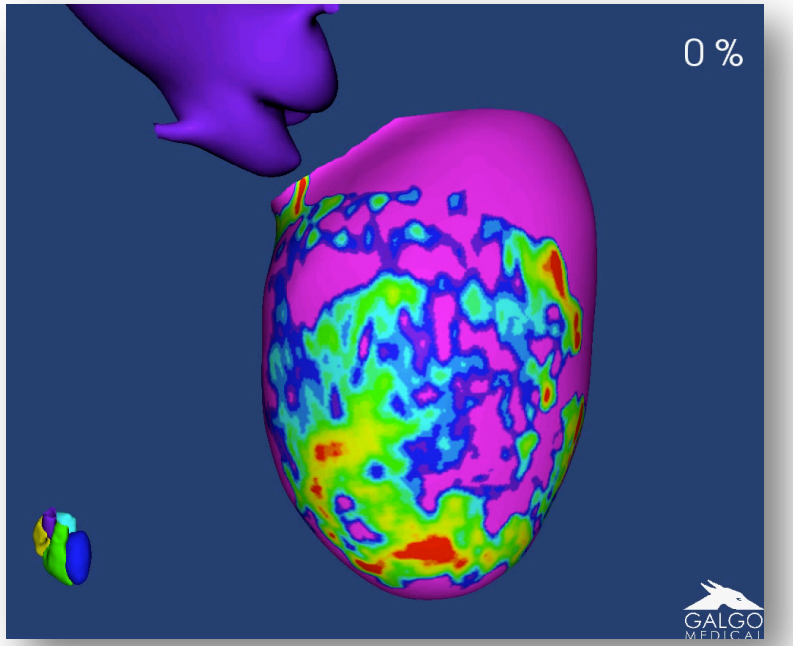
Marta Gigli, MD,[a,b,*] Marco Merlo, MD,[a,*] Sharon L. Graw, PhD,[b] Giulia Barbati, PhD,[c] Teisha J. Rowland, PhD,[b] Dobromir B. Slavov, PhD,[b] Davide Stolfo, MD,[a] Mary E. Haywood, PhD,[b] Matteo Dal Ferro, MD,[a] Alessandro Altinier, MD,[a] Federica Ramani, PhD,[a] Francesca Brun, MD,[a] Andrea Cocciolo, MD,[a,b] Ilaria Puggia, MD,[a,b] Gaetano Morea, MD,[a,b] William J. McKenna, MD, DSc,[d,e] Francisco G. La Rosa, MD,[f] Matthew R.G. Taylor, MD, PhD,[b] Gianfranco Sinagra, MD,[a] Luisa Mestroni, MD[b]

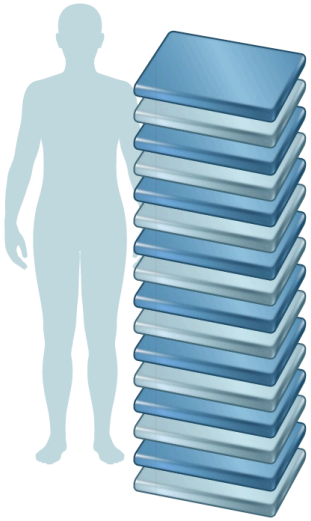
J Am Coll Cardiol 2019;74:1480–90



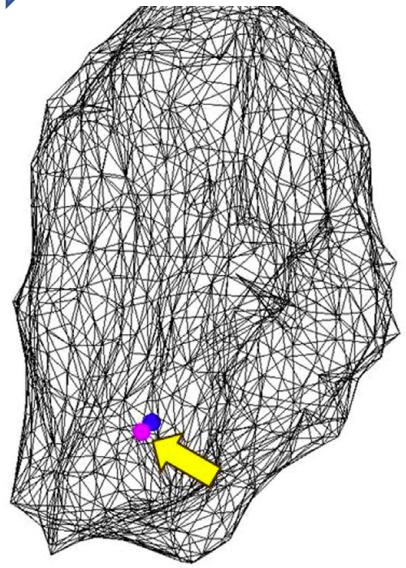
Desmosomal and LMNA gene variants identify the subset of DCM patients who are at greatest risk for SCD and life-threatening VA, regardless of the LVEF.

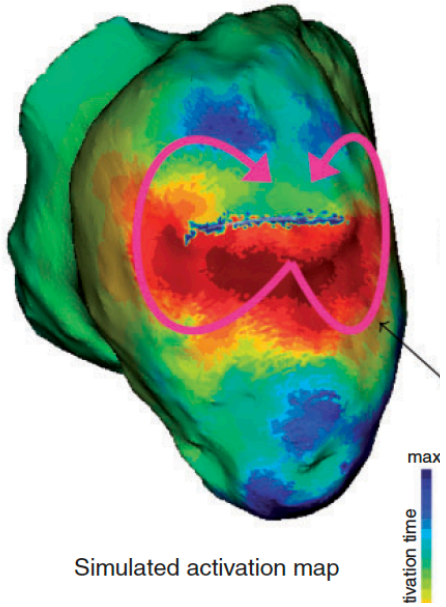






Inputs
Social, behavioral
Genomics and -omic layers
Biosensors
Immune system
Gut microbiome
Anatome
Environmental
Physical activity, sleep, nutrition
Medication, alcohol, drugs
Labs, plasma DNA, RNA
Family history
Communication, speech
Cognition, state of mind
All medical history
World's medical literature, continually updated





Simulated activation map

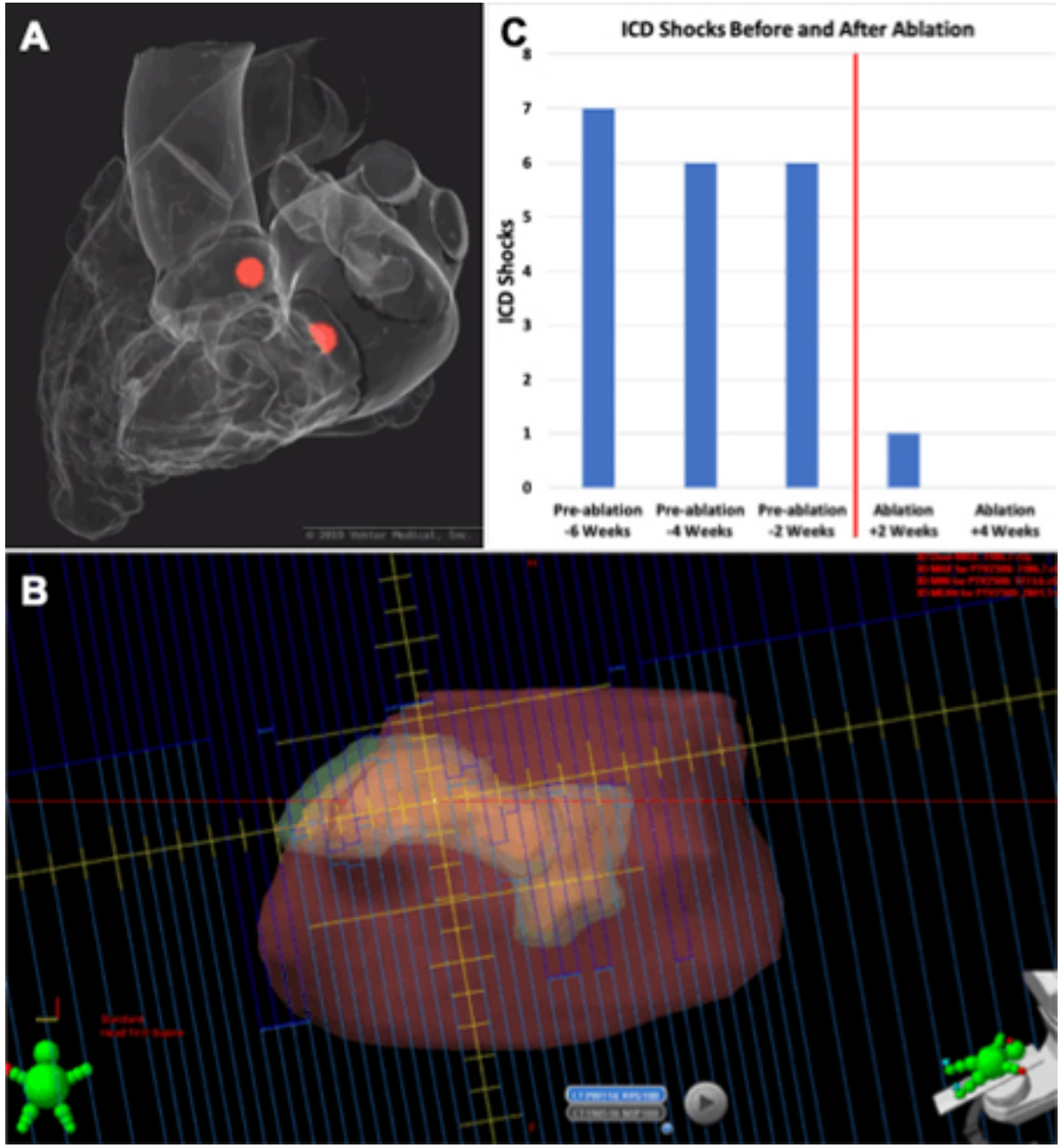
ELECTROPHYSIOLOGY AND ARRHYTHMIAS
SESSION TITLE: ADVANCES IN NOVEL ABLATION TECHNOLOGIES

Abstract 15492: Non-Invasive Radiation Therapy of Ventricular Tachycardia Storm Guided by Computerized 12-Lead ECG-Based Mapping

Gordon Ho, Todd Atwood, Kevin Murphy, Andrew Bruggeman, Elliot R McVeigh, Andrew Kahn, Gregory K Feld, Christopher Villongco, David E Krummen

Originally published 11 Nov 2019 | Circulation. 2019;140:A15492

A 76-year-old male with non-ischemic cardiomyopathy (EF 29%) presented with VT storm totaling 2700 anti-tachycardia therapies and 52 ICD shocks despite maximal antiarrhythmic medications and a history of amiodarone pulmonary fibrosis.



Der beste Weg, die Zukunft vorherzusagen, ist, sie zu gestalten.

Peter Drucker