Ablation de TV

Apport de l'imagerie et identification du substrat anatomique

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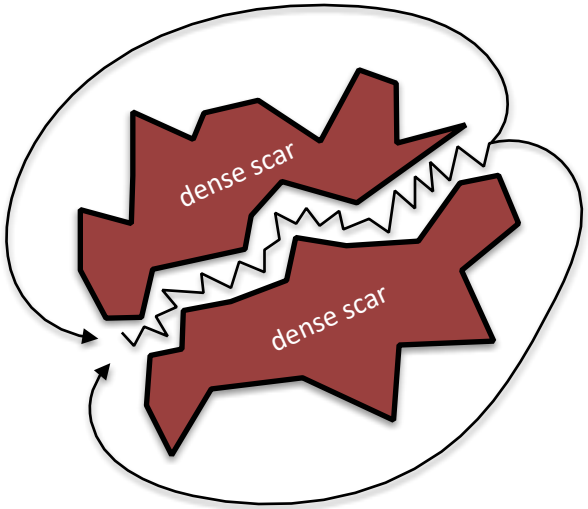
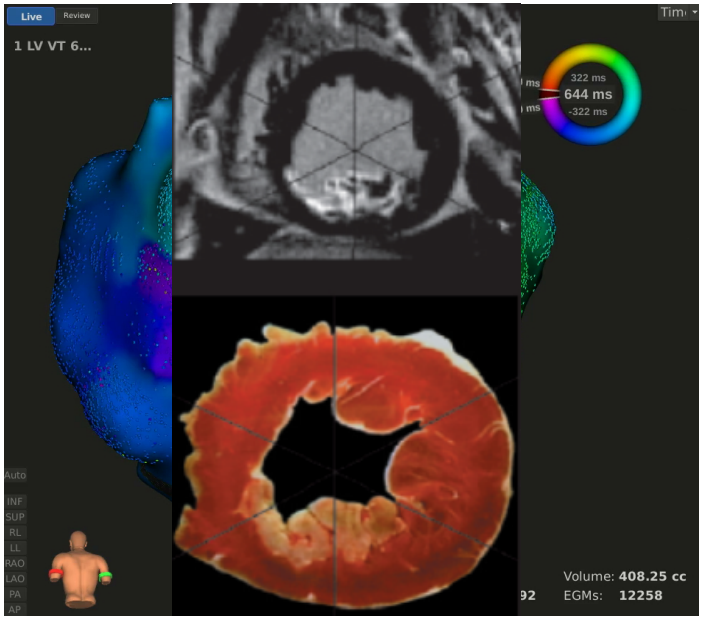
DISCLOSURES

Shareholder:	Co-founder of inHEART
Grant/Research Support:	Siemens Healthineers Guerbet Medtronic
Speaker/Consultant fees:	Siemens Healthineers Biosense Webster Boston Scientific Abbott Fineheart Farapulse

VENTRICULAR ARRHYTHMIA
MECHANISMS

Ursell PC et al.
Circ Res. 1985;56:436-51



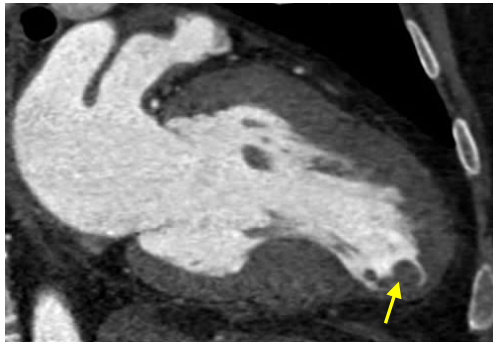


Wagner A et al.
Lancet. 2003;361:374-9

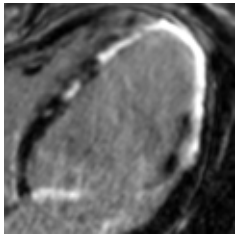
VT ABLATION

PRE-PROCEDURAL PLANNING

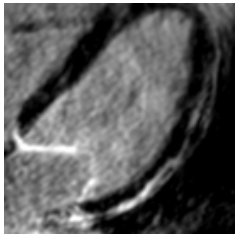
THROMBUS



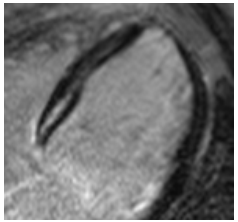
ACCESS ROUTE



LV endo

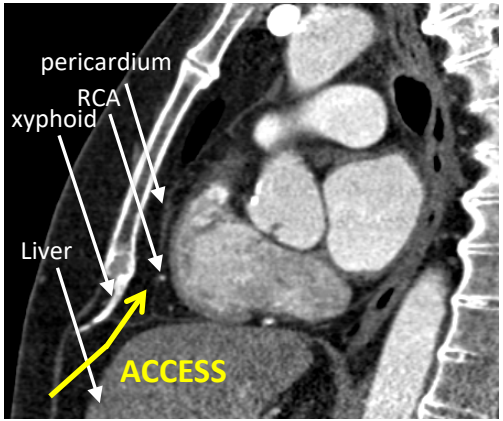


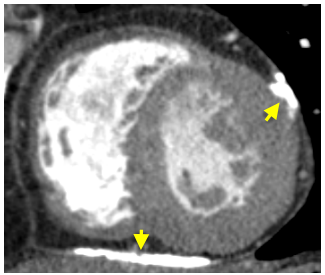
CS?
Epicardial?



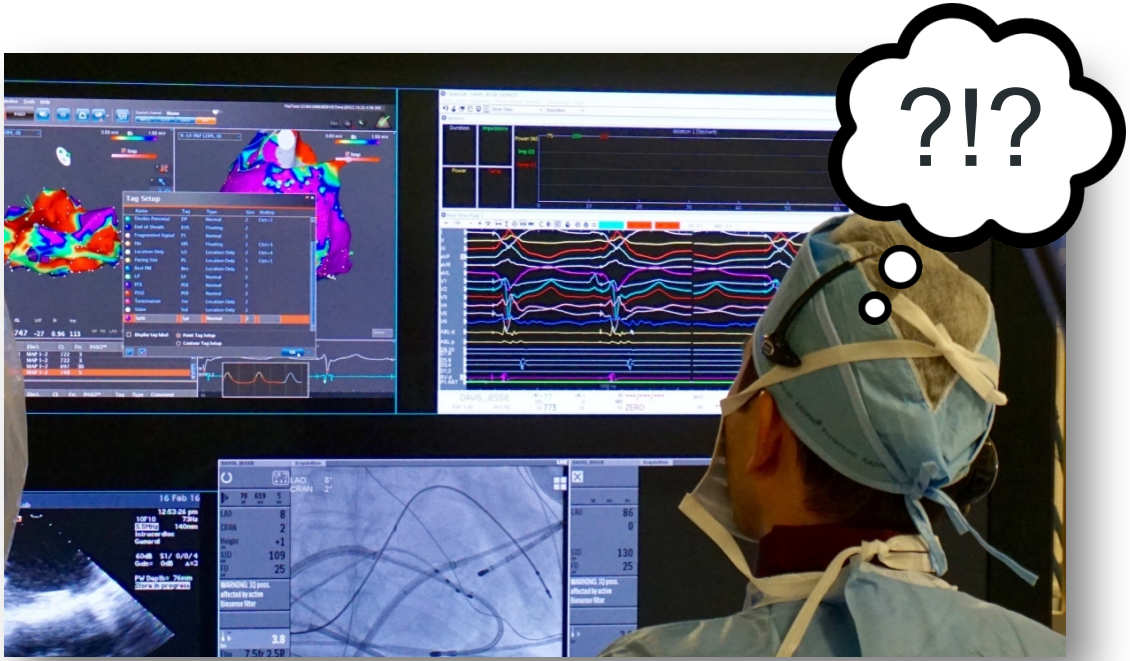
LV+RV endo?
Septal artery?

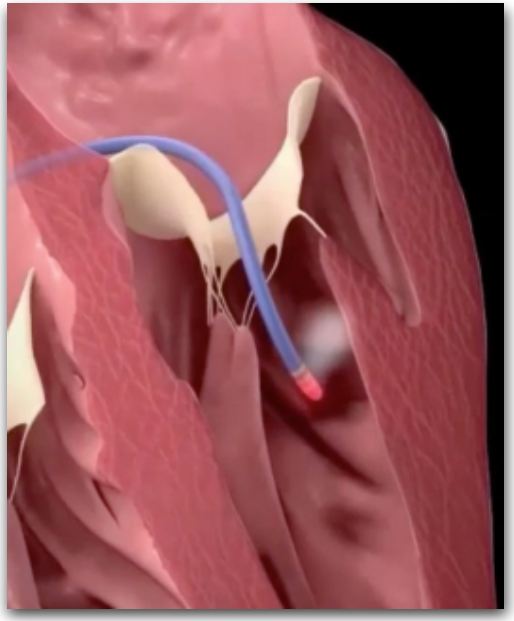
EPICARDIAL ACCESS





INTRA-PROCEDURAL GUIDANCE: WHY?



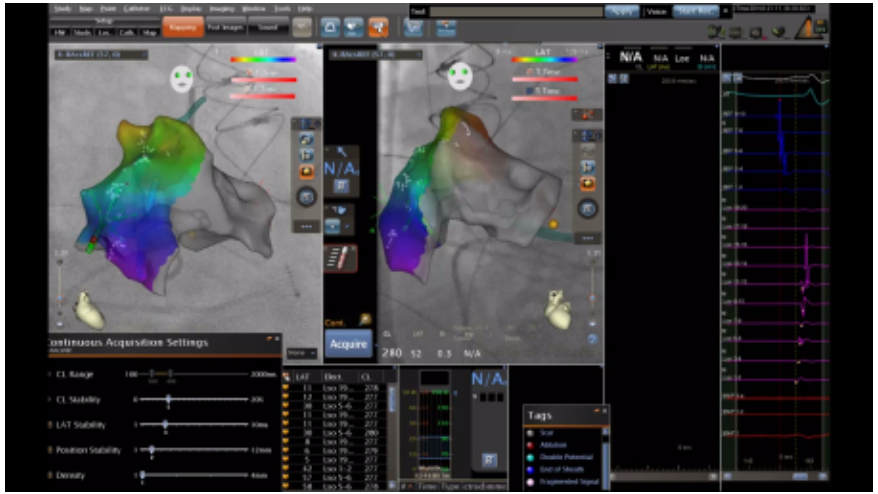


Diagnosis (4-5h) | Therapy (1h)

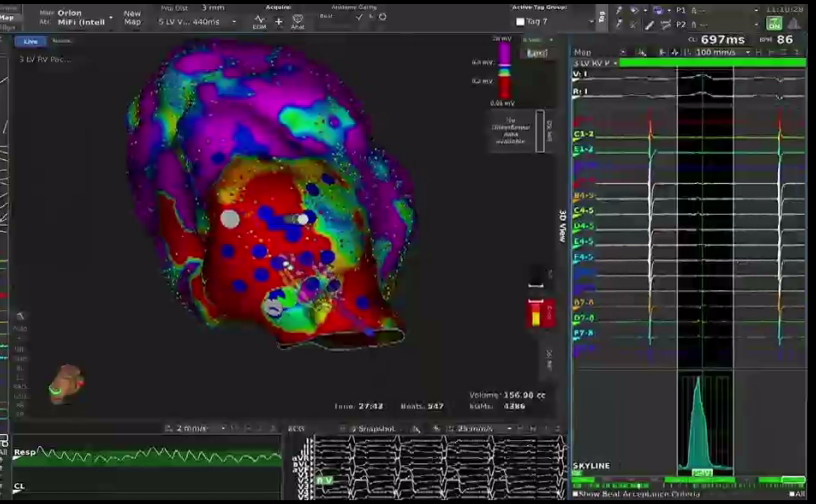
Procedure Time

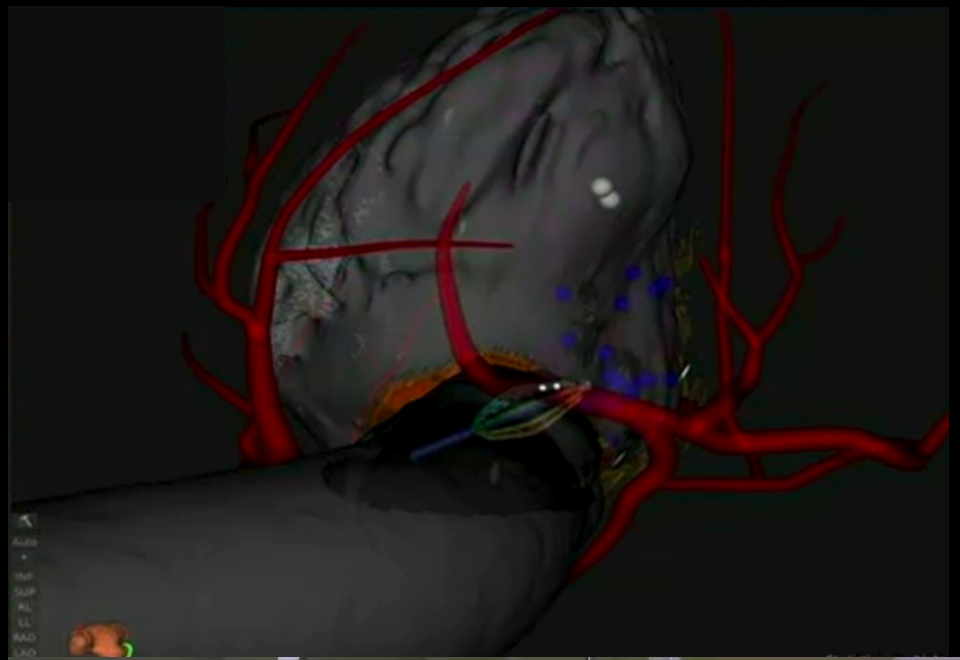
INTRA-PROCEDURAL GUIDANCE: HOW?

Intra-operative **electrical** diagnosis



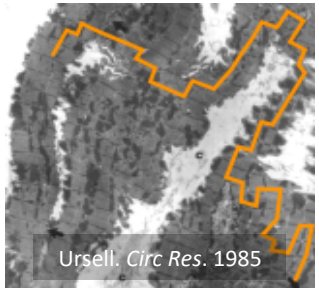
Pre-operative **structural** diagnosis

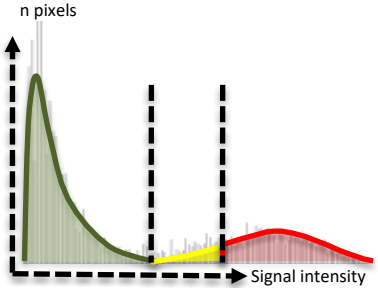


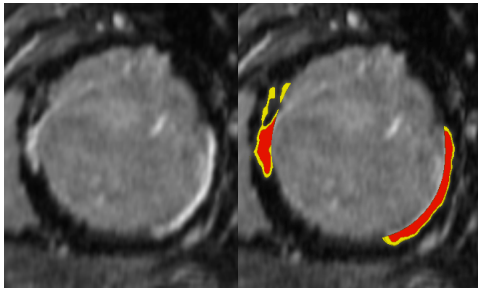


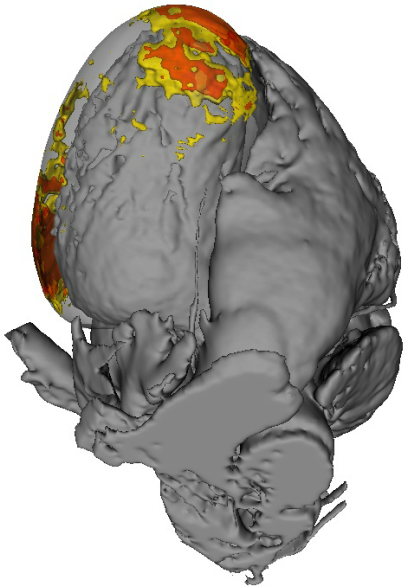
- Improved efficacy
- Shorter procedures
- Simplification/standardization

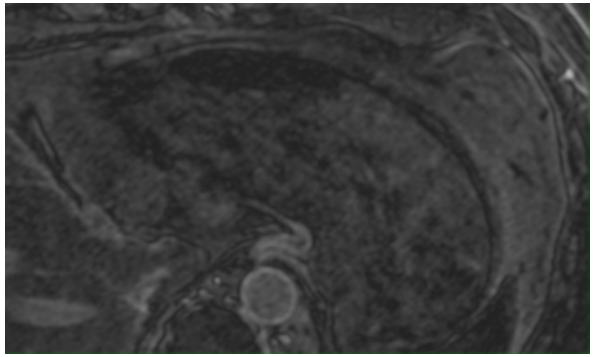
SUBSTRATE MAPPING FROM MRI:
LATE GADOLINIUM ENHANCEMENT

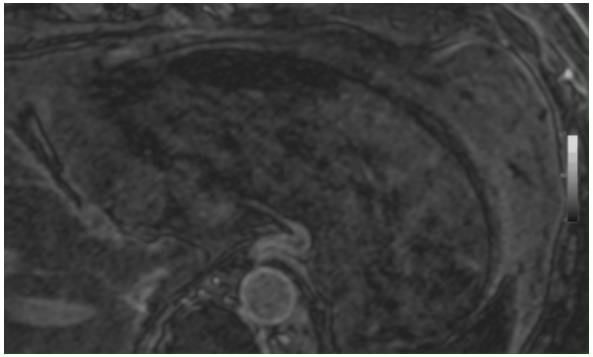




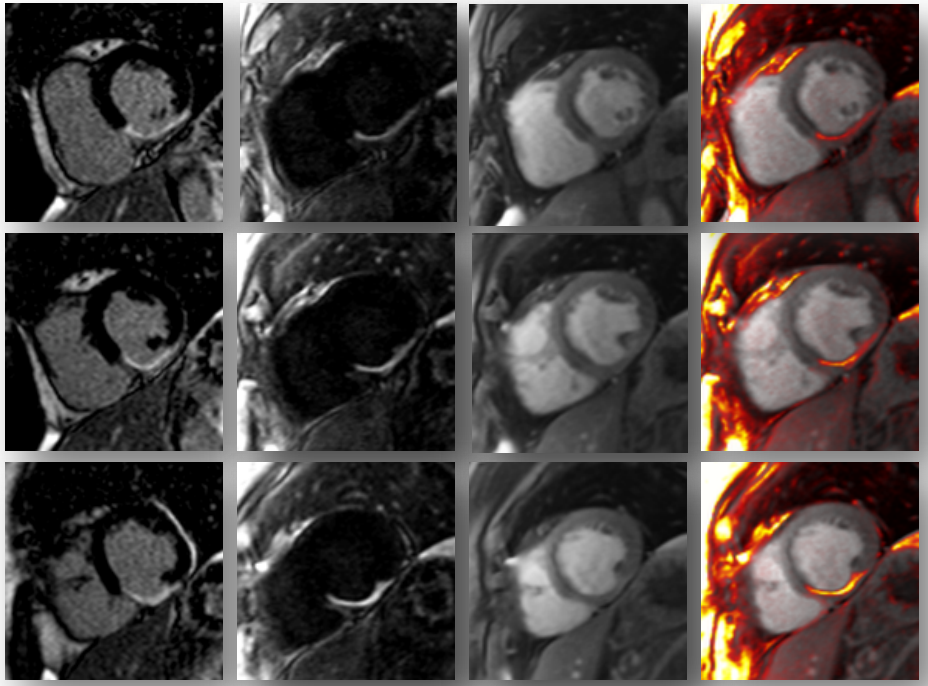




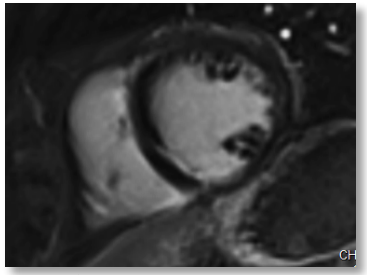




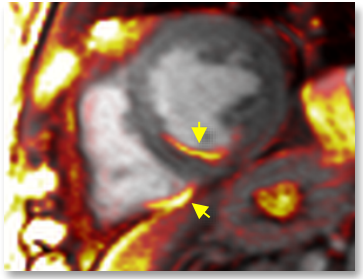
INNOVATIONS
NOVEL LGE CONTRASTS



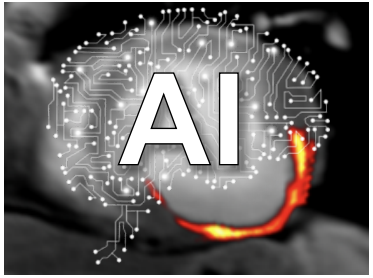
State-of-the-art



Proposed



➡ Improved sensitivity / specificity

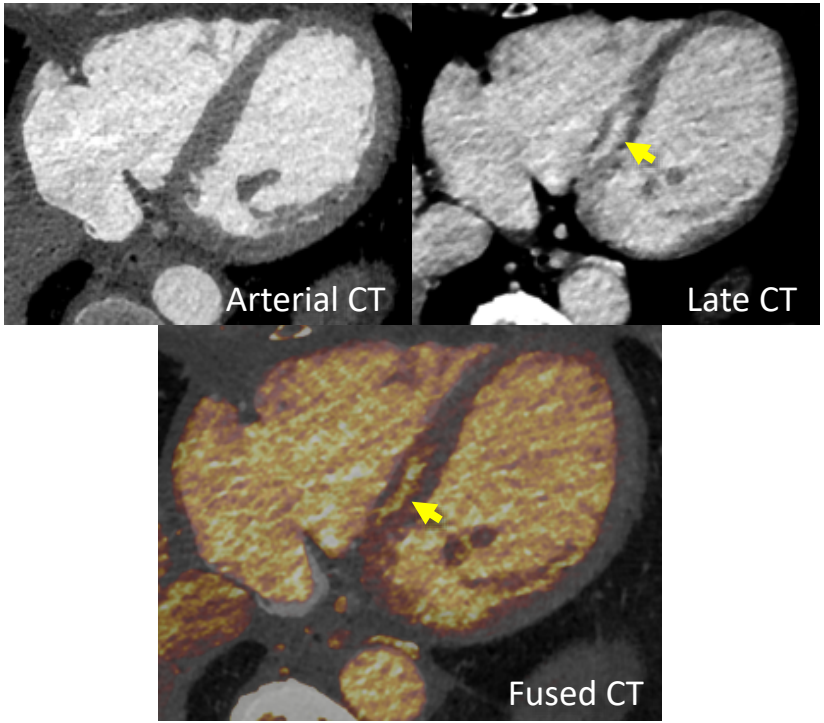


➡ Automated quantification

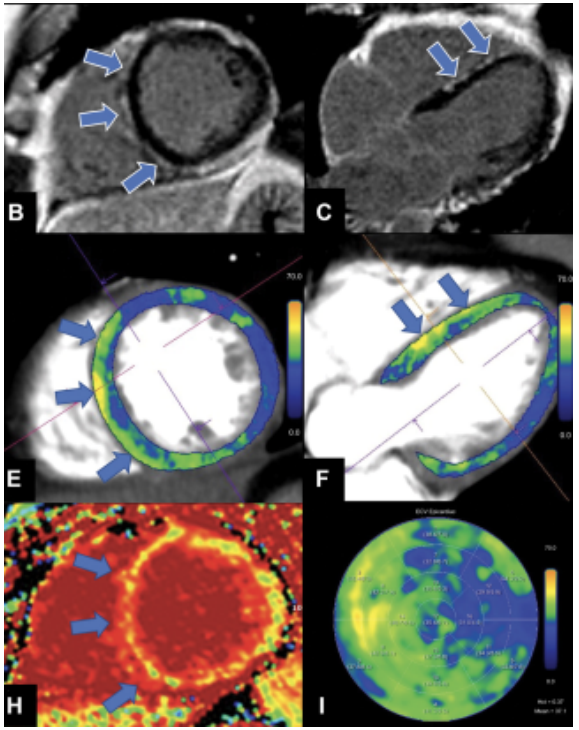
Bustin A. ISMRM 2022

SUBSTRATE MAPPING FROM CT
MULTI-PARAMETRIC

LATE IODINE-ENHANCED CT



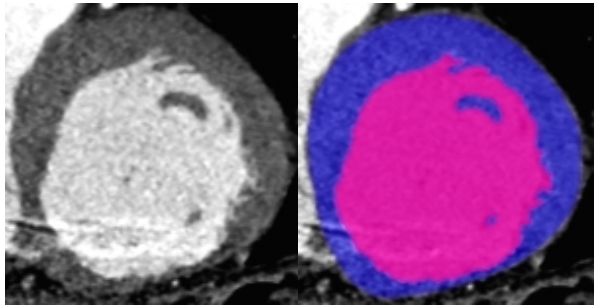
EXTRACELLULAR VOLUME CT



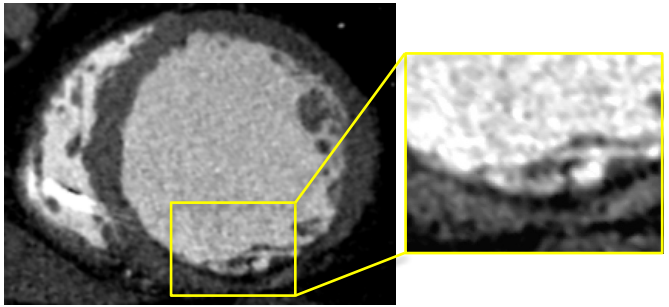
Aquino GJ, et al. Radiology. 2023 Apr;307(2):e222030.

SUBSTRATE MAPPING FROM CT
MULTI-PARAMETRIC

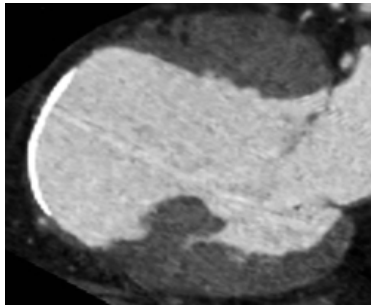
ARTERIAL



Wall thinning

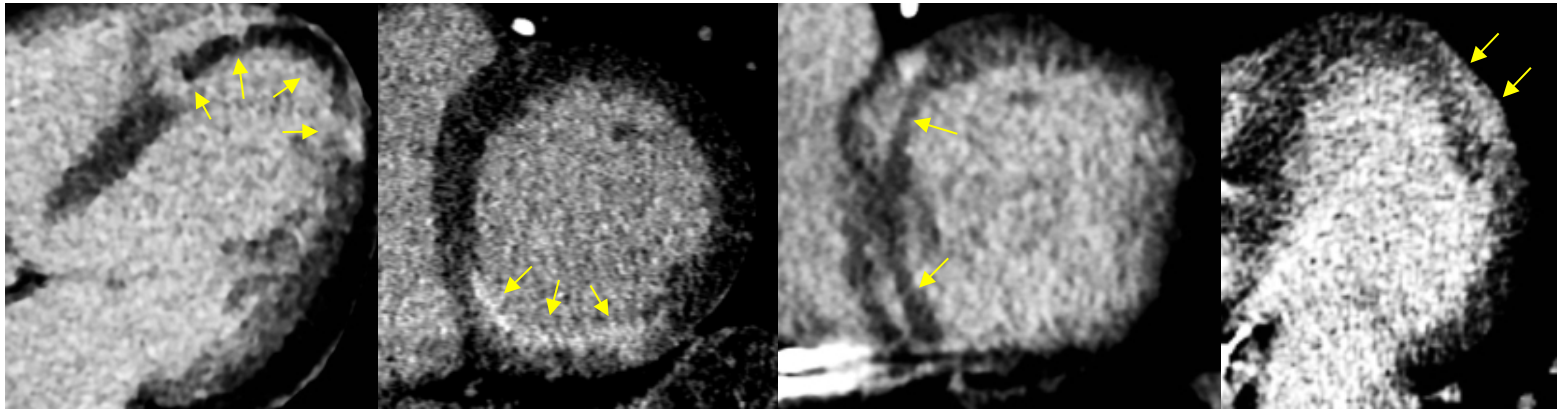


Fat



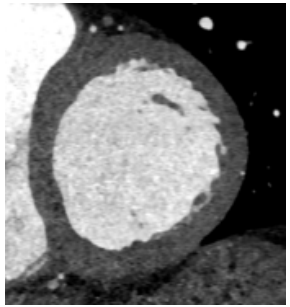
Calcification

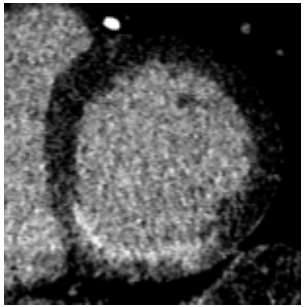
LATE

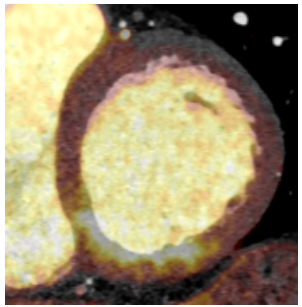


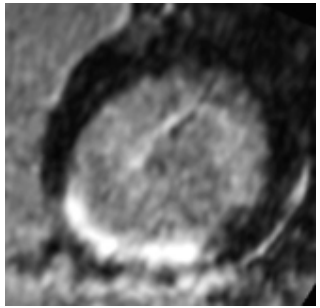
Late iodine enhancement

SUBSTRATE MAPPING FROM CT: POST-INFARCTION







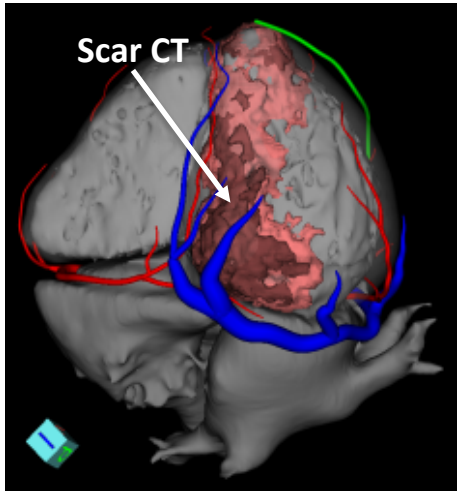


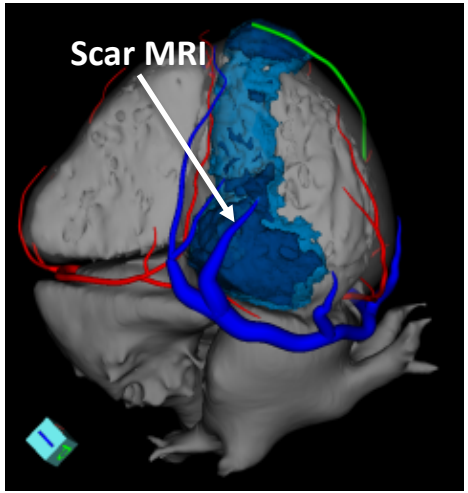
CT arterial

CT late

Fusion

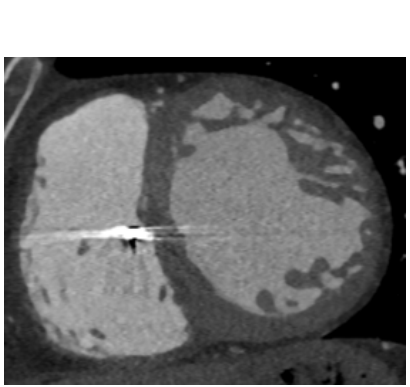
MRI

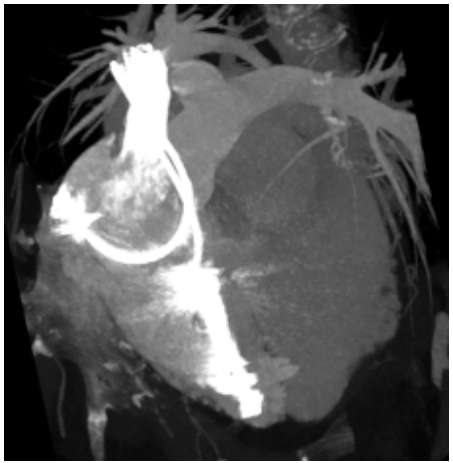




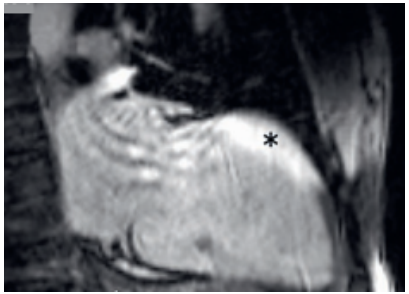
CHOOSING THE RIGHT MODALITY
ICD ARTIFACTS?

CT: artifacts from leads (minor)





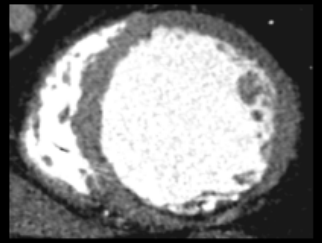
MR: artifacts from can (major)



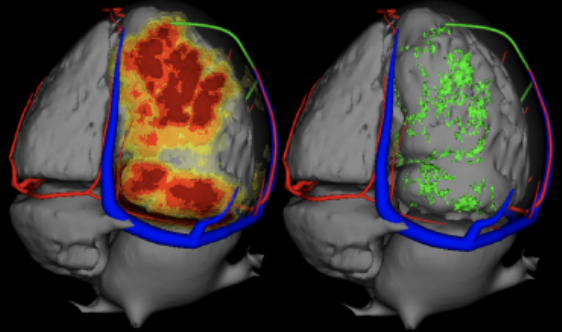
CHOOSING THE RIGHT MODALITY

UNDERLYING DISEASE?

POST-INFARCTION

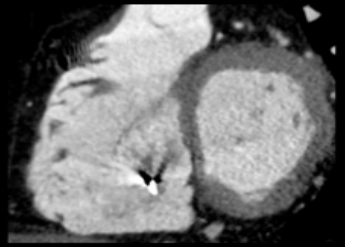


Arterial CT

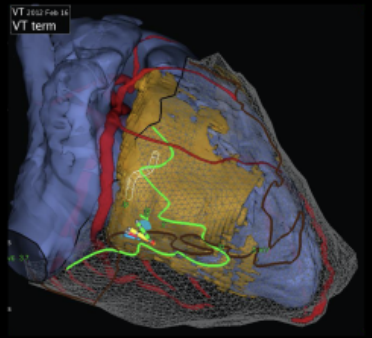


Wall thickness Myocardial fat

ARVC

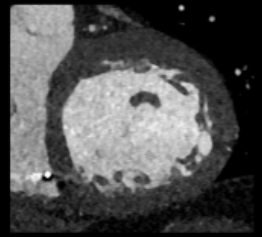


Arterial CT

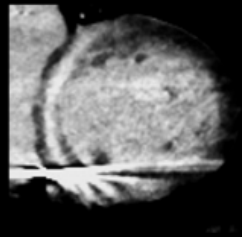


Myocardial fat

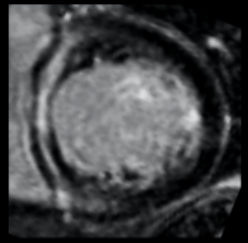
NICM



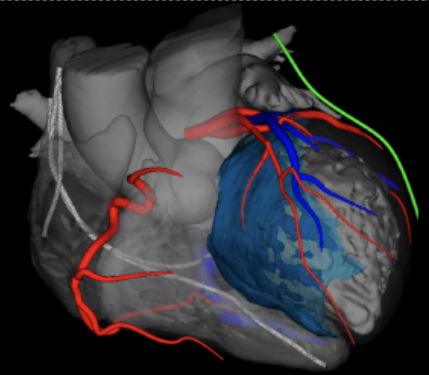
Arterial CT



Late CT



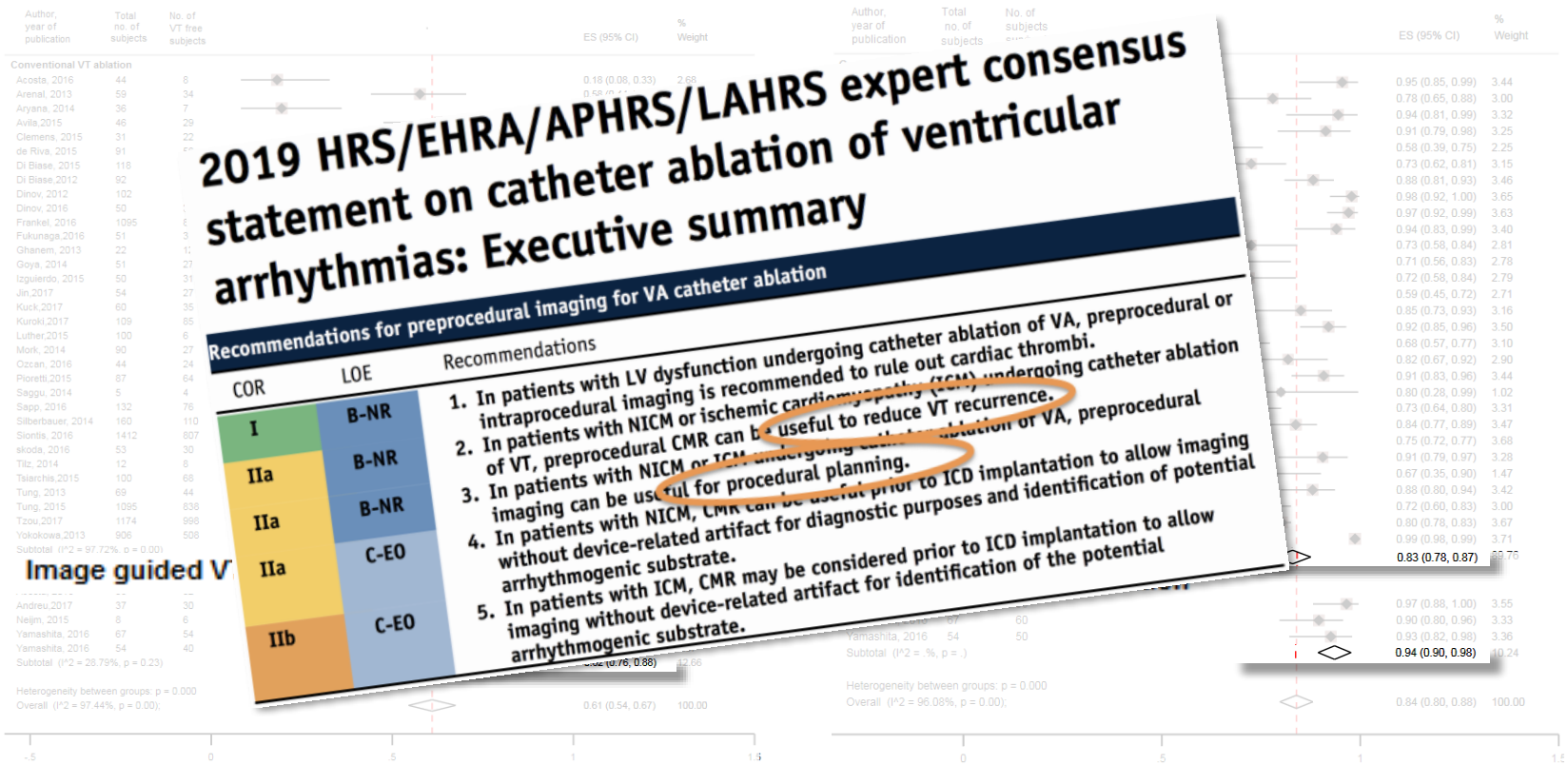
Late MR



Late enhancement dense scar & grey zone

IMAGE-ASSISTED ABLATION
IMPACT ON OUTCOME

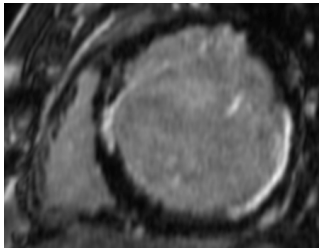
VT-FREE SURVIVAL



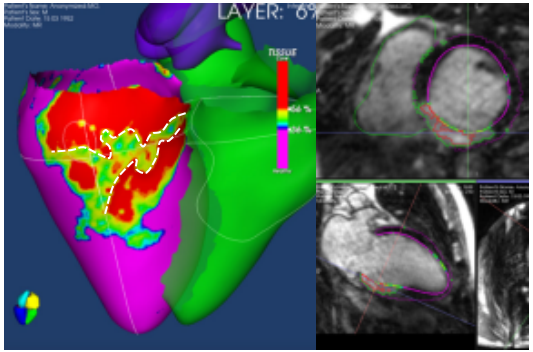
Hendriks. EP Europace. 2017 Jun;19(3):483.

PERSPECTIVE

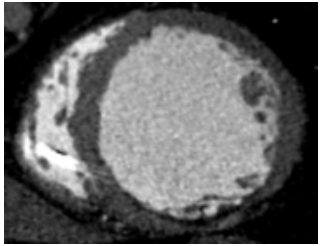
IMAGE-BASED TARGETS



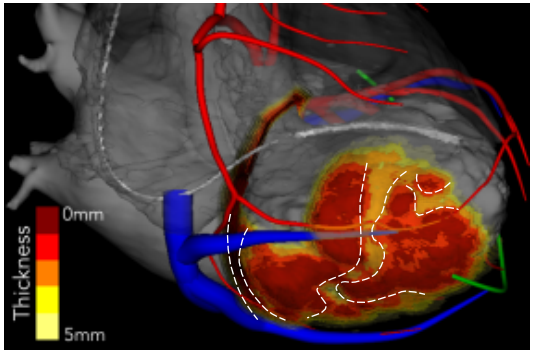
CMR



Andreu D. Heart Rhythm. 2017

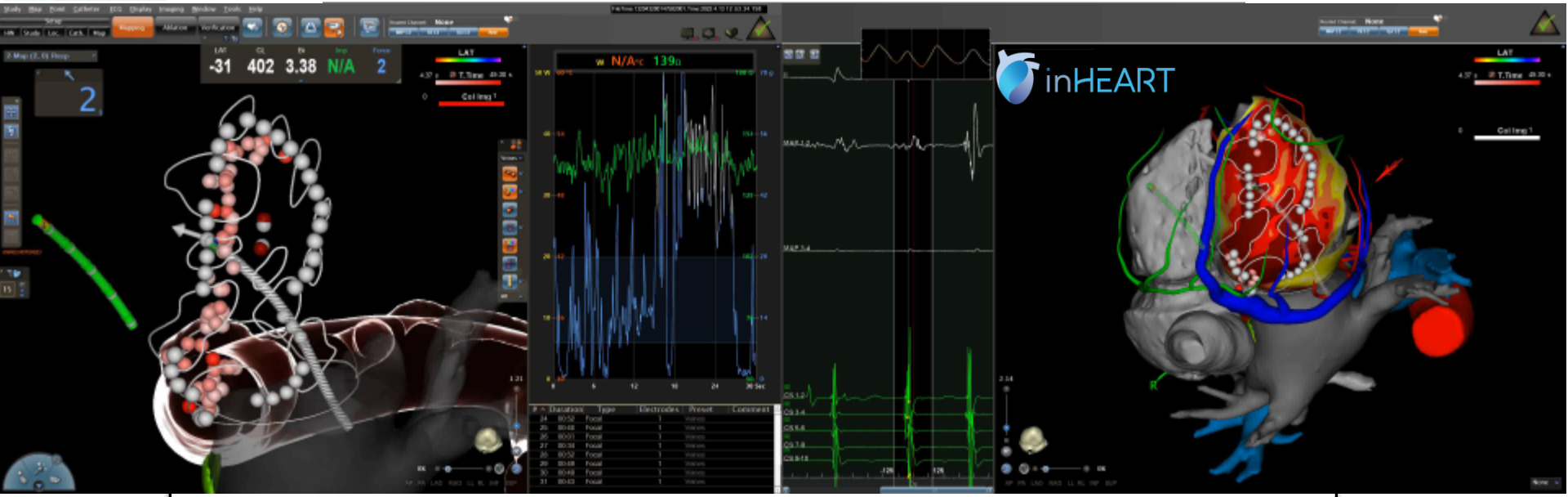


CT



Takigawa M, et al. Heart Rhythm. 2019

PERSPECTIVE
IMAGE-BASED TARGETS



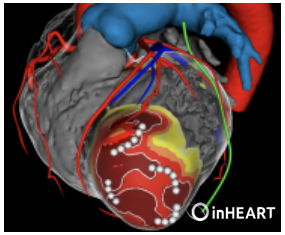
EUROPEAN RCT (FU ongoing)

16 European centers

Primo-ablation for post-MI VT

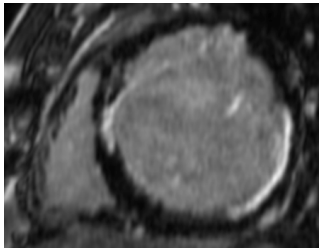
Random. 1:1 CT channel vs. conventional approach

Primary endpoint: procedure time & cost efficiency

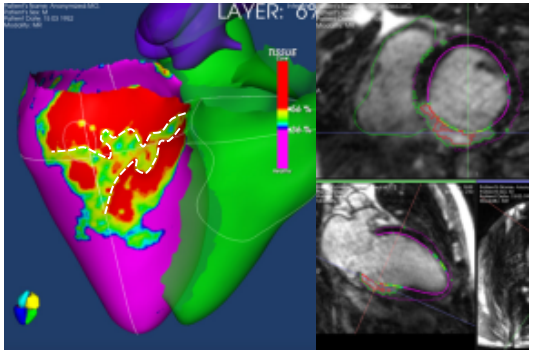


PERSPECTIVE

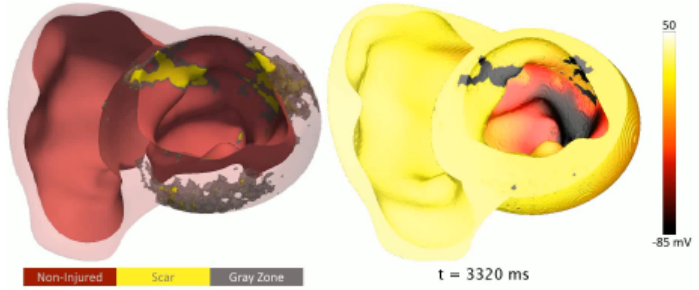
IMAGE-BASED SIMULATION OF VT



CMR



Andreu D. Heart Rhythm. 2017



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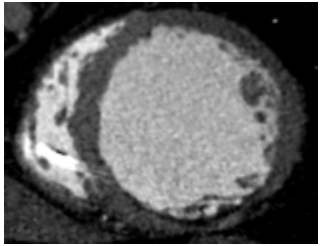

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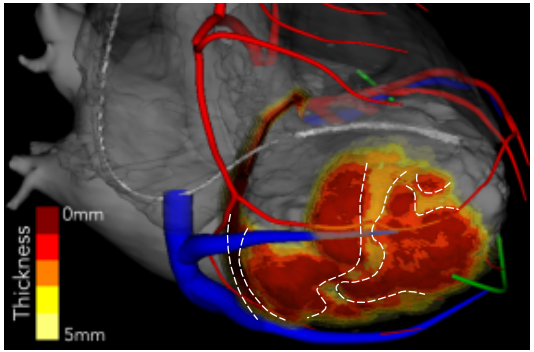
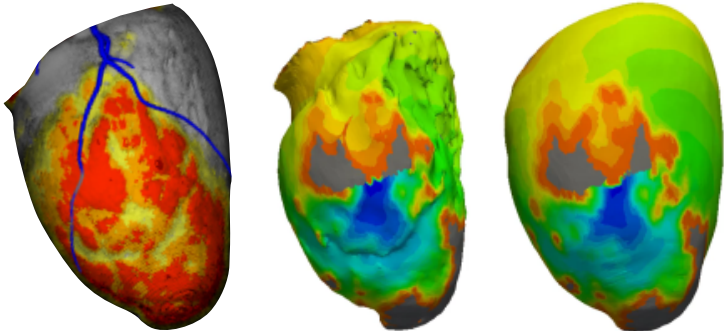


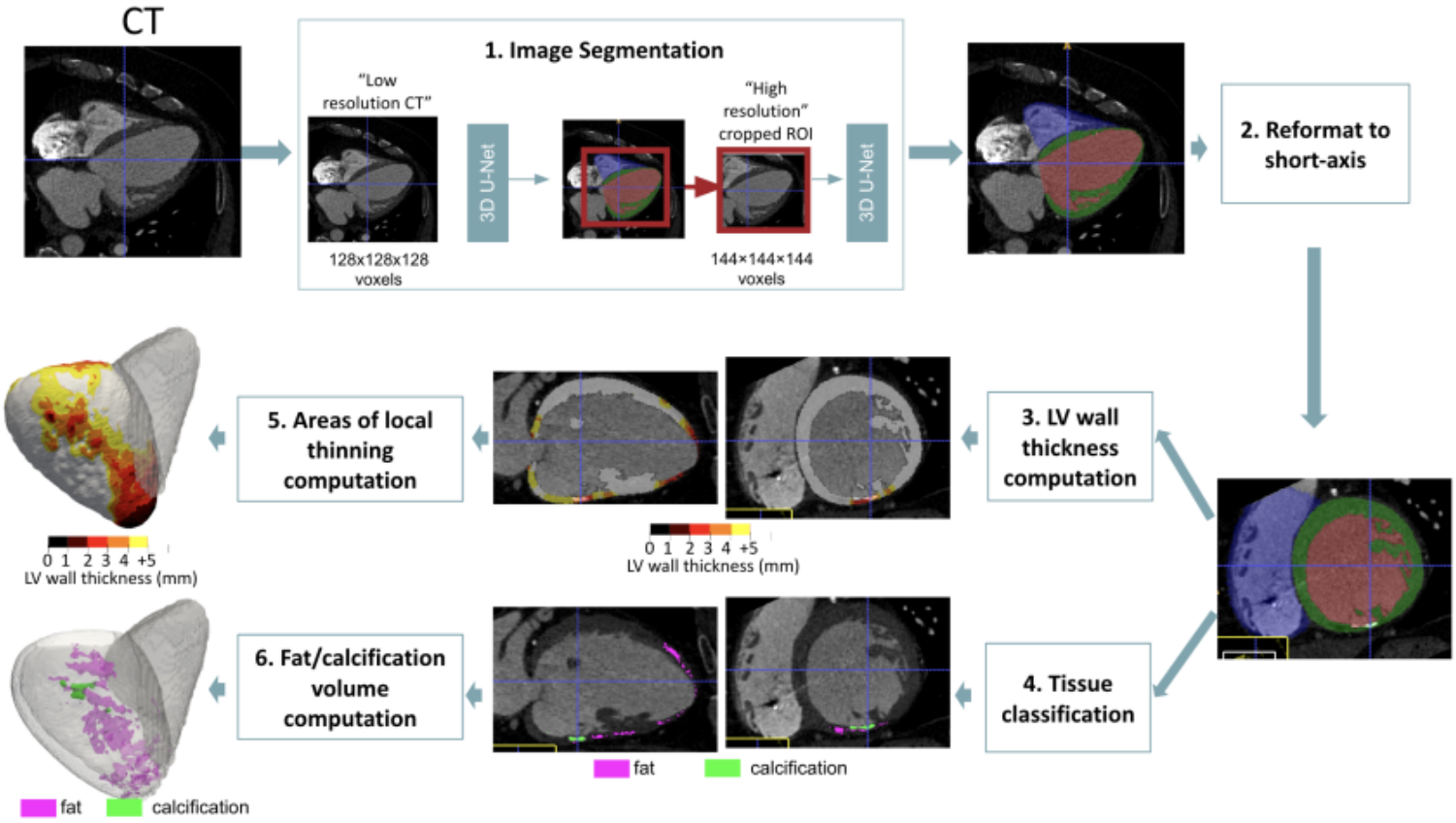
Takigawa M, et al. Heart Rhythm. 2019

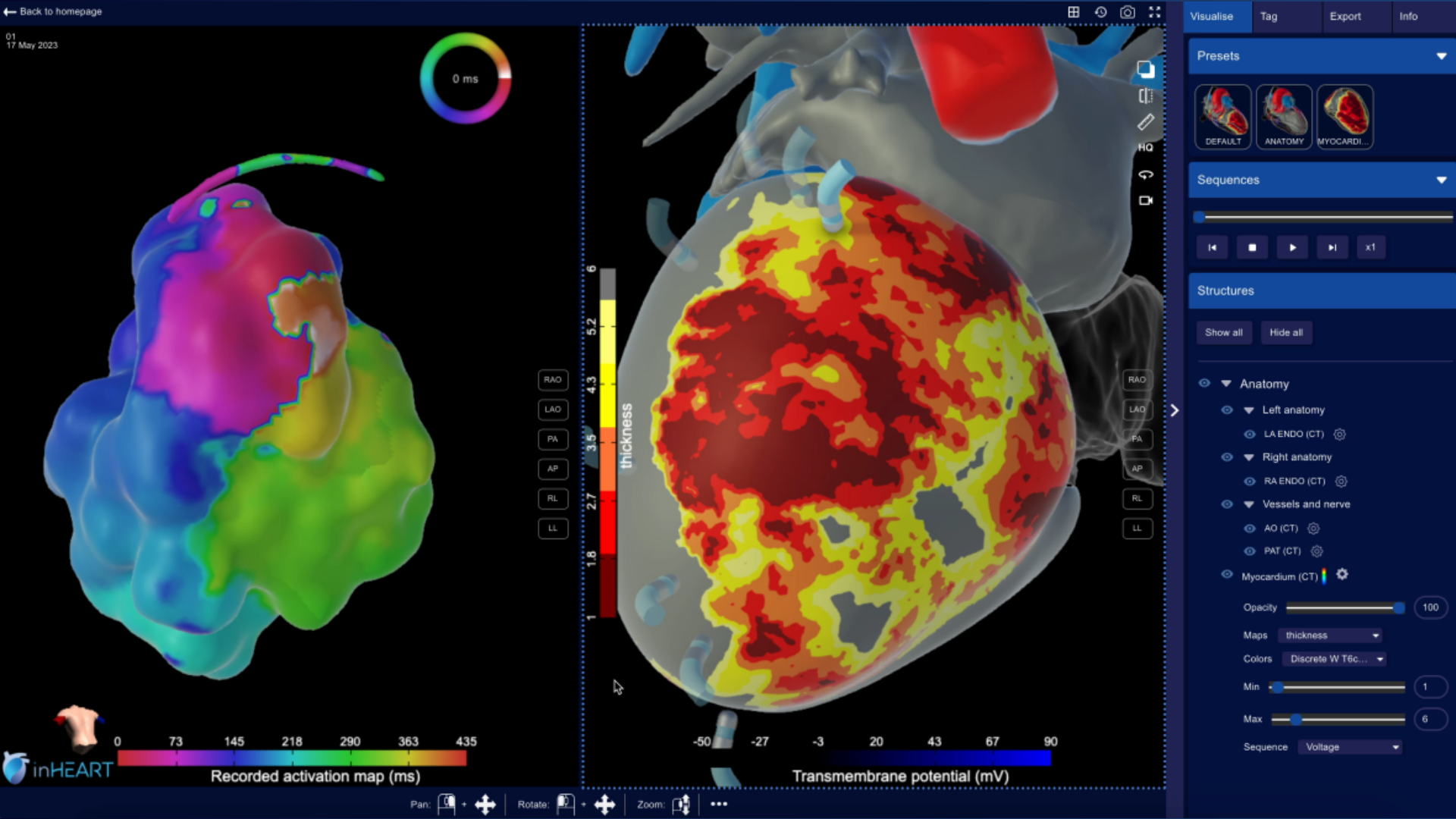


Cedilnik N, et al. Europace. 2019

THE FUTURE IN VT

CLINICALLY TRACTABLE SIMULATIONS

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01
17 May 2023
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Zoom:
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Visualise
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Presets
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MYOCARDI...
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Structures
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Hide all
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Right anatomy
RA ENDO (CT)
Vessels and nerve
AO (CT)
PAT (CT)
Myocardium (CT)
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Maps
thickness
Colors
Discrete W T6c...
Min
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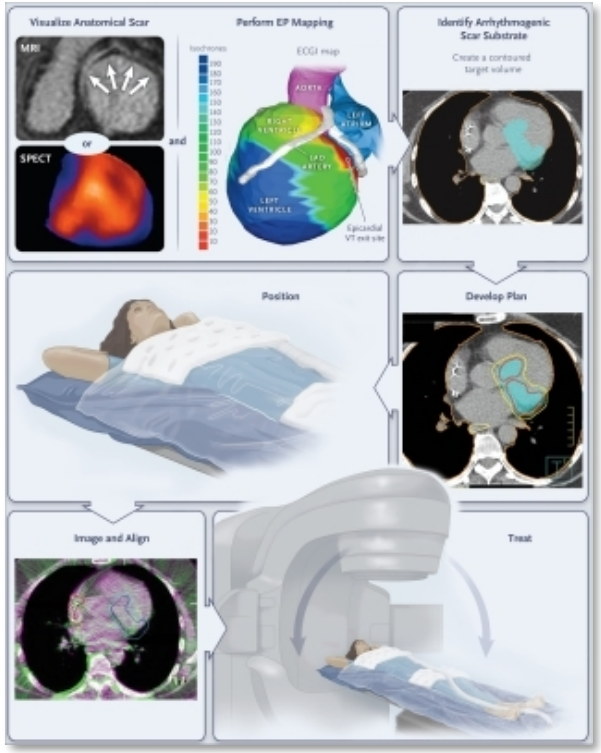
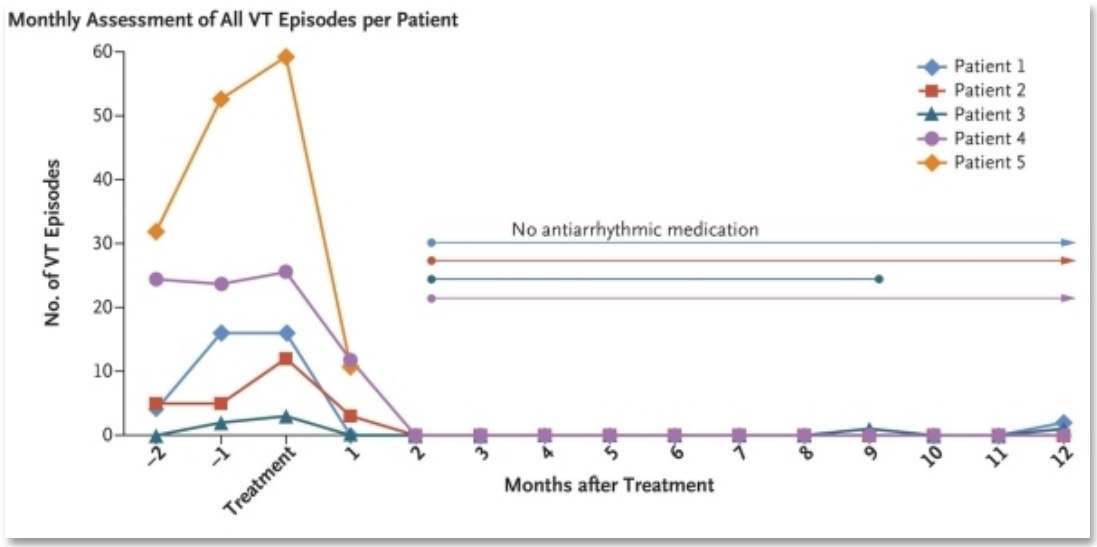
Max
6
Sequence
Voltage

ORIGINAL ARTICLE

Noninvasive Cardiac Radiation for Ablation of Ventricular Tachycardia

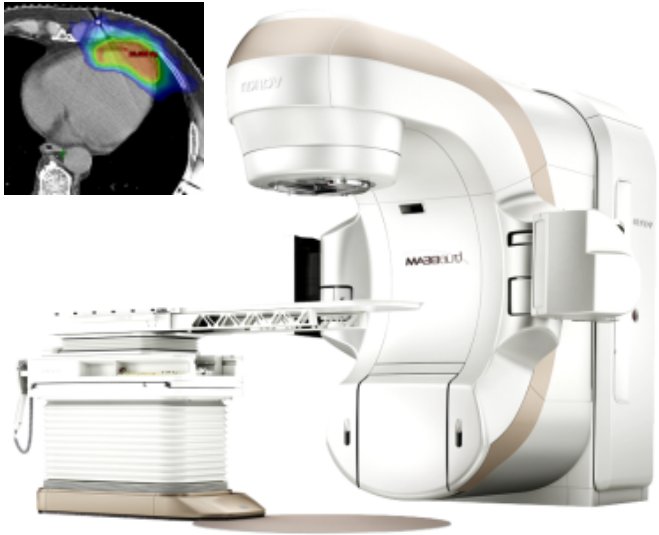
Phillip S. Cuculich, M.D., Matthew R. Schill, M.D., Rojano Kashani, Ph.D., Sasa Mutic, Ph.D., Adam Lang, M.D., Daniel Cooper, M.D., Mitchell Faddis, M.D., Ph.D., Marye Gleva, M.D., Amit Noheria, M.B., B.S., Timothy W. Smith, M.D., D.Phil., Dennis Hallahan, M.D., Yoram Rudy, Ph.D., et al.





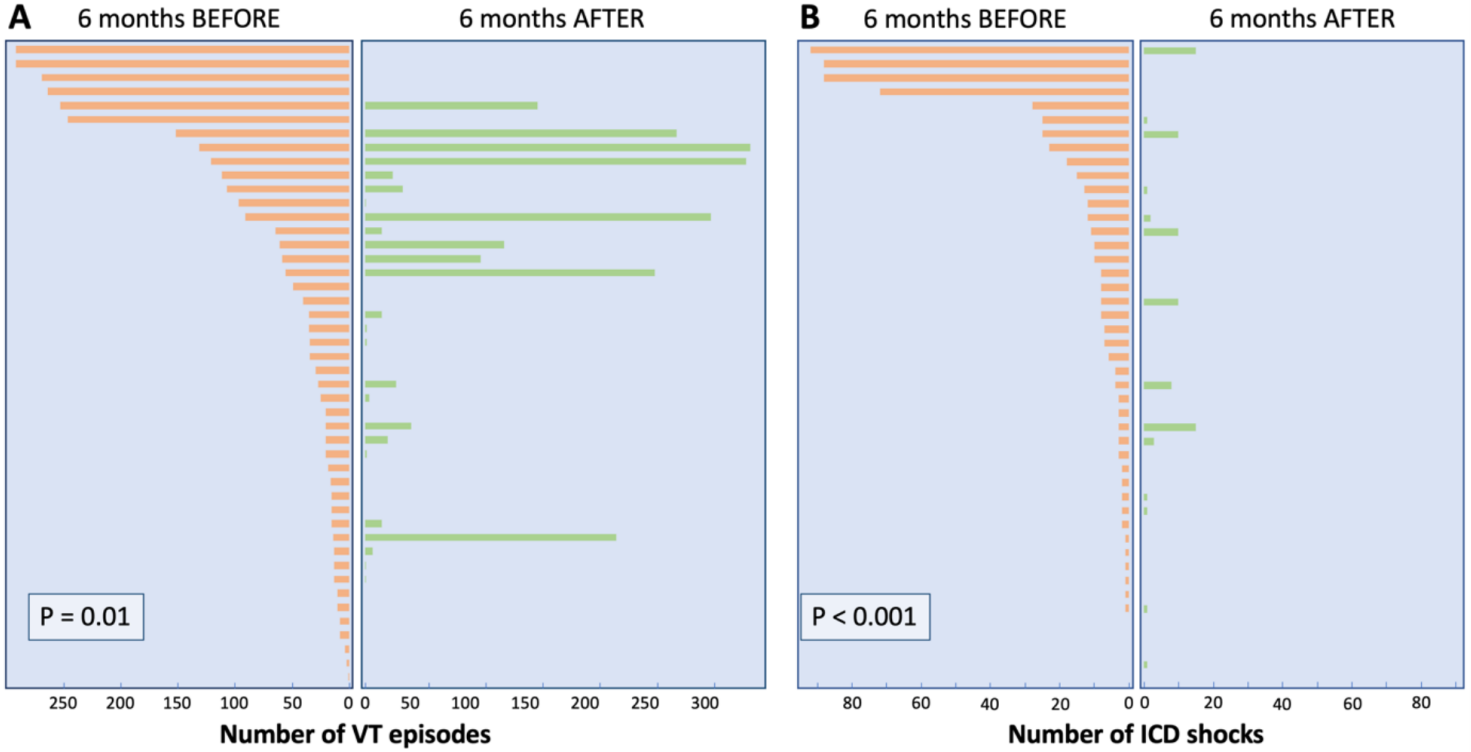
PERSPECTIVE

IMAGE-GUIDED RADIO-ABLATION OF VT



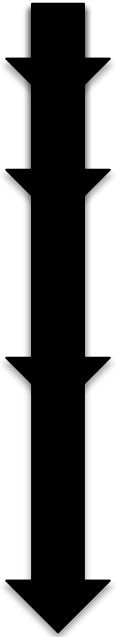
RADIOABLATION OF VT

CLINICAL RESULTS (N=51)



CONCLUSIONS

Role of pre-procedural imaging in catheter ablation



before ablation	diagnosis of underlying etiology
ablation planning	detection of thrombus need for epicardial access challenges of epicardial access
ablation guidance	enhanced definition of substrate & anatomy identifying structures at risk (coronaries, phrenic) direct definition of ablation targets
perspective	fully non-invasive cardiac ablation