

LOT-CRT: combinare CSP e BiV per ottimizzare la resincronizzazione

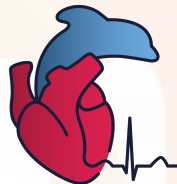
Cosimo Mandurino

Laboratorio di Cardiostimolazione ed Elettrofisiologia

U.O.C: Cardiologia/UTIC

P.O.C. «SS. Annunziata»

ASL Taranto



Elettrofisiologia
SS. Annunziata | Taranto



BIVP

CSP



Conduction System vs Biventricular Pacing in Heart Failure The PhysioSync-HF Randomized Clinical Trial

André Zimmerman, MD, PhD; Alexander dal Forno, MD; Luis E. Rohde, MD, PhD; Caique M. Ternes, MD, PhD; Fernanda D. Alves, PhD; Lucas P. Damiani, PhD; Martino Martinelli-Filho, MD, PhD; Roberto Costa, MD, PhD; Alexsandro A. Fagundes, MD; Rodrigo M. Barbosa, MD; Eduardo B. Gadelha, MD; Carlos Eduardo Lima, MD, PhD; Márcio A. Silva, MD; Jaime A. Maldonado, MD; Julio César de Oliveira, MD, PhD; Fabricio Mallmann, MD; José M. Baggio Júnior, MD; Carlos E. Duarte, MD; Liliane A. de Souza, PhD; Juliana S. Santos, BSc; Anderson D. Silveira, MD, PhD; Sérgio R. R. Decker, MD, PhD; Leandro I. Zimmerman, MD, PhD; Carisi A. Polanczyk, MD, PhD; André d'Ávila, MD, PhD

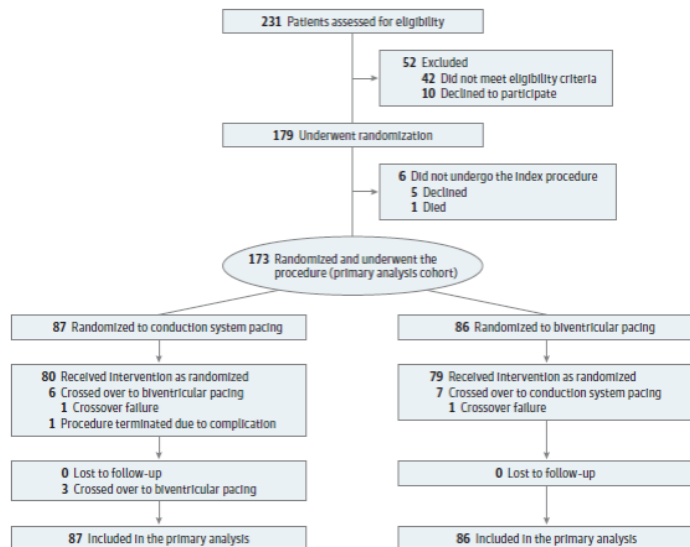


Figure 2. Component Bar Graph Showing Primary End Point Results*

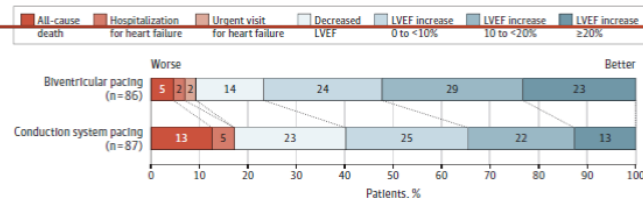
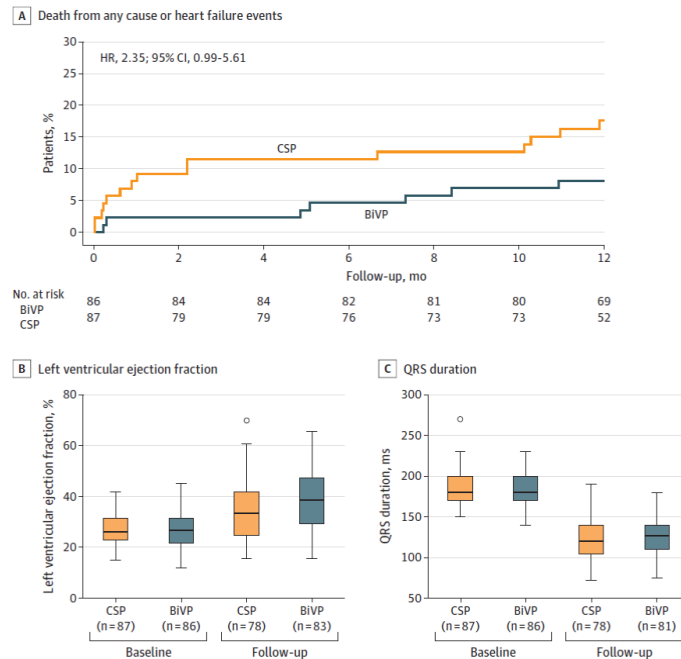


Figure 3. Kaplan-Meier Survival Plot and Box Plots of Secondary End Points



Long-Term Outcomes of Left Bundle-Branch Pacing vs Biventricular Pacing in Heart Failure

The HeartSync-LBBP Randomized Clinical Trial

Xueying Chen, MD; Xi Liu, MD; Ruogu Li, MD; Zhongkai Wang, MD; Yixiu Liang, MD; Lei Zhang, MD; Wei Wang, MD; Jin Bai, MD; Jingfeng Wang, MD; Shengmei Qin, MD; Weiwei Zhang, MD; Tianbao Yao, MD; Dong Huang, MD; Ting Chen, MD; Xianxian Zhao, MD, PHD; Dening Liao, MD, PHD; Jingbo Li, MD, PHD; Jialiang Mao, MD, PHD; Mihail G. Chelu, MD, PHD; Yangang Su, MD, PHD; Kenneth A. Ellenbogen, MD; Junbo Ge, MD, PHD

Figure 1. CONSORT Diagram of the Study Cohort

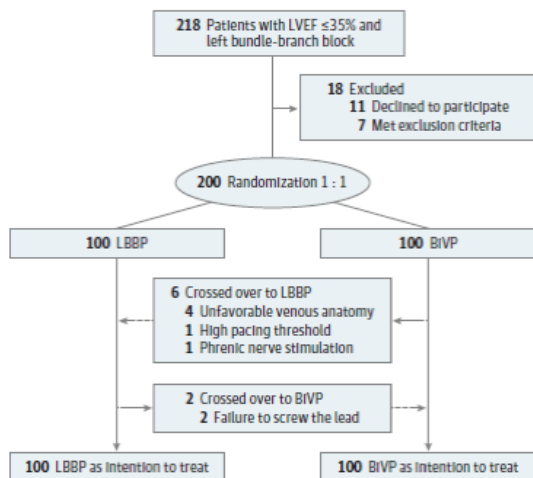
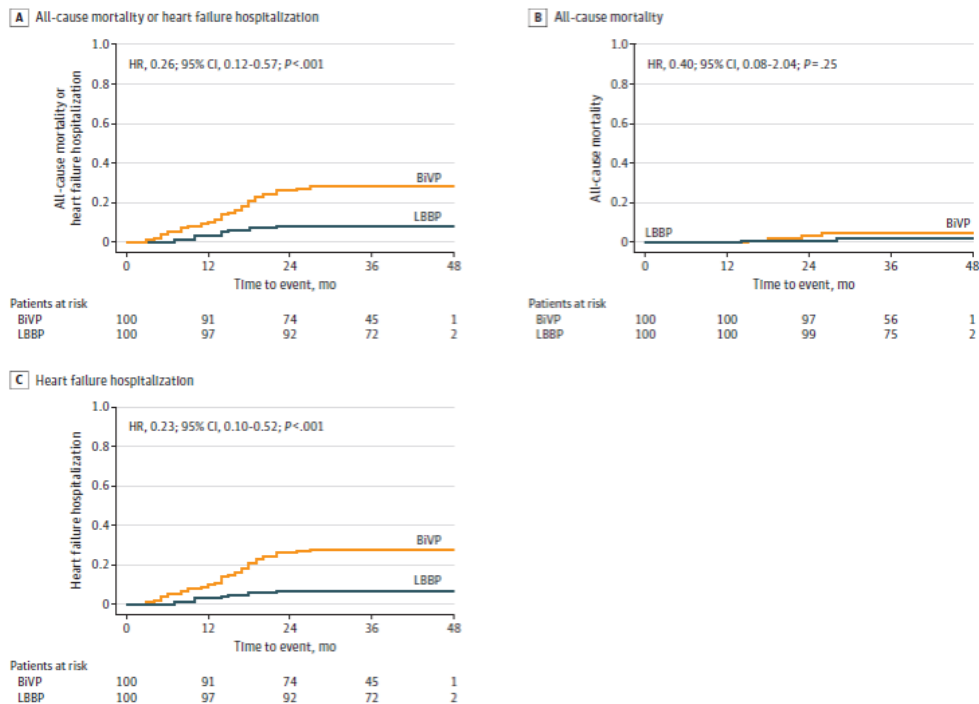


Figure 2. Kaplan-Meier Estimates of All-Cause Mortality and Heart Failure Hospitalization



BiVP indicates biventricular pacing; HR, hazard ratio; LBBP, left bundle-branch pacing.



ESC

European Society
of Cardiology

Europace (2025) 27, eua050
<https://doi.org/10.1093/europace/eua050>

EHRA DOCUMENT



EHRA

European Heart
Rhythm Association

European Society of Cardiology (ESC) clinical consensus statement on indications for conduction system pacing, with special contribution of the European Heart Rhythm Association of the ESC and endorsed by the Asia Pacific Heart Rhythm Society, the Canadian Heart Rhythm Society, the Heart Rhythm Society, and the Latin American Heart Rhythm Society

Michael Glikson , FESC (Chair)^{1,2*}, Haran Burri , FEHRA, FESC (Chair)^{3*}, Amr Abdin , Oscar Cano , Karol Curila , Jan De Pooter , Juan C. Diaz , (LAHRS Representative)⁹, Inga Drossart , (ESC Patient Forum Representative)^{10,11}, Weijian Huang , (APHRS Representative)¹², Carsten W. Israel , Marek Jastrzębski , Jacqueline Joza , (CHRS Representative)¹⁵, Jarkko Karvonen , Daniel Keene , Christophe Leclercq , FESC, FEHRA¹⁸, Wilfried Mullens , Margarida Pujol-Lopez , Archana Rao , Kevin Vernooij , FESC, FEHRA²², Pugazhendhi Vijayaraman , (HRS Representative)²³, Francesco Zanon , and Yoav Michowitz , (Document Coordinator)^{1,2*}



Feasibility and efficacy of left bundle branch area pacing in patients indicated for cardiac resynchronization therapy

Yuqiu Li¹, Lirong Yan², Yan Dai³, Yu'an Zhou, Qi Sun, Ruohan Chen, Jinxuan Lin, Yuanhao Jin, Feng Chen, Xiaogang Guo, Keping Chen, and Shu Zhang

State Key Laboratory of Cardiovascular Disease, Arrhythmia Center, Fudan Hospital, National Center for Cardiovascular Diseases, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100027, China

Received: 20 May 2020; revised version 10 August 2020; accepted after revision 11 August 2020

LBBAP: evidenze cliniche

LBBAP per CRT

- 25 pazienti, HF e indicazione alla CRT:
- 5 pazienti come alternativa a failure di posizionamento LV

Conclusions

The present investigation demonstrates the clinical feasibility of LBBAP in CRT-indicated patients. Left bundle branch area pacing was associated with significant narrowing of QRSd, improvement in cardiac function, and a decrease in LVEDD. Left bundle branch area pacing may be an alternative to CRT in patients with failure of LV lead placement and the first-line option in the selected patients such as those with typical LBBB and heart failure with narrow QRSd. In addition, LOT-CRT resulted in improved electrical resynchronization and might improve clinical outcomes. Further prospective, randomized, and long-term studies are essential to compare the clinical benefits of LBBAP with BiV pacing and HBP.

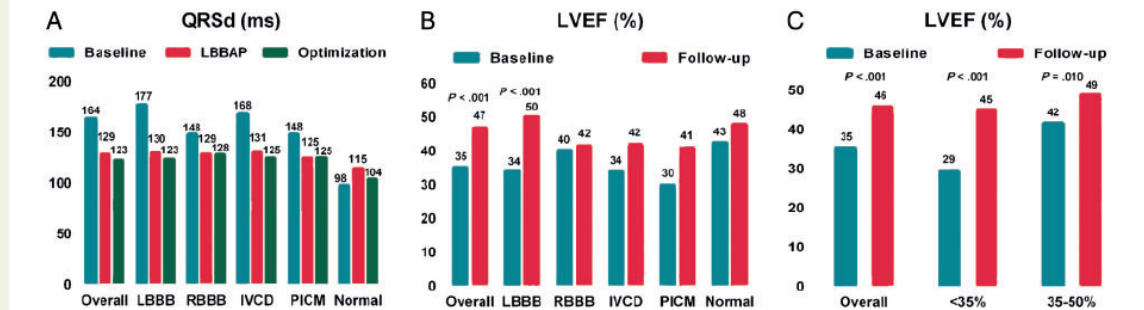


Figure 2 QRSd and echocardiographic outcomes. (A) QRSd at baseline, during LBBAP, and after optimization. (B and C) LVEF at baseline and follow-up. ECG, electrocardiogram; LBBAP, left bundle branch area pacing; LVEF, left ventricular ejection fraction; QRSd, QRS duration.

- Riduzione QRS
- Miglioramento della funzionalità cardiaca
- Riduzione LVEDD
- LBBAP può essere **un'alternativa alla CRT o la prima scelta** in pazienti selezionati
- **LOT-CRT migliora la resincronizzazione** e può migliorare l'outcome



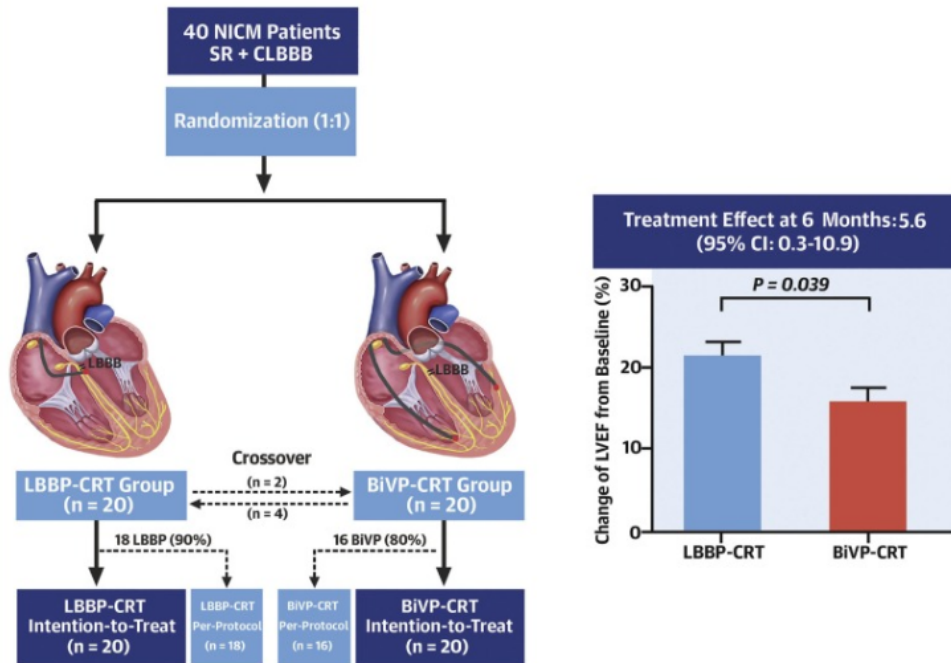
Evidenze cliniche LBBP

2022, studio randomizzato 1:1

Randomized Trial of Left Bundle Branch vs Biventricular Pacing for Cardiac Resynchronization Therapy

Yao Wang, MD, PhD,^{1,2*} Haojie Zhu, MD,^{3,4} Xiaofeng Hou, MD,⁵ Zhao Wang, MD, PhD,³ Fengwei Zou, MD,⁵ Zhiyong Qian, MD, PhD,³ Yongqun Wei, MD, PhD,³ Xiang Wang, BS,³ Longyao Zhang, MD,³ Xiaofei Li, MD,³ Zhimin Liu, MD,³ Siyuan Xue, MD,³ Chaoteng Qin, MD,³ Jixin Zeng, MD,³ Hui Li, MD,³ Hongping Wu, MD,³ Hong Ma, MD,³ Kenneth A. Ellenbogen, MD,⁶ Michael R. Gold, MD, PhD,³ Xiaohan Fan, MD, PhD,³ Jiangang Zou, MD, PhD,^{1,2*} on behalf of the LBBP-RESYNC Investigators

CENTRAL ILLUSTRATION: Left Bundle Branch Pacing vs Biventricular Pacing for cardiac Resynchronization Therapy



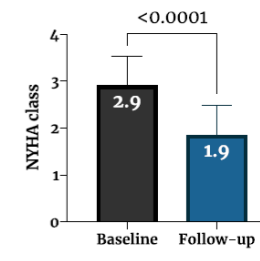
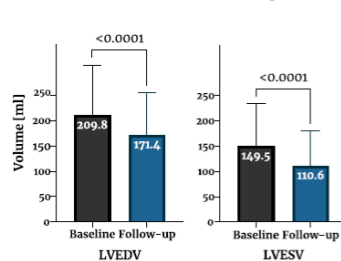
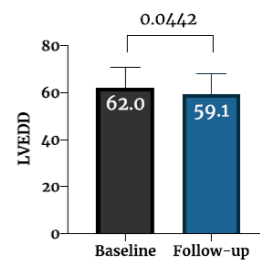
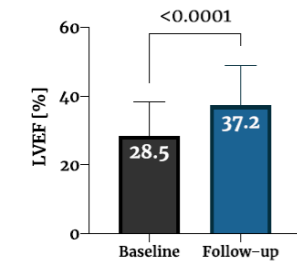
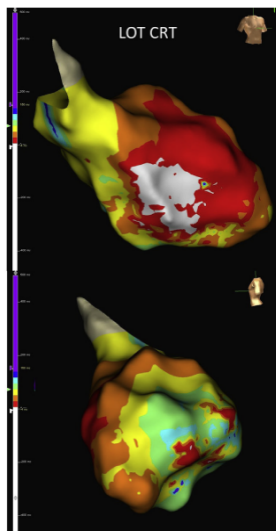
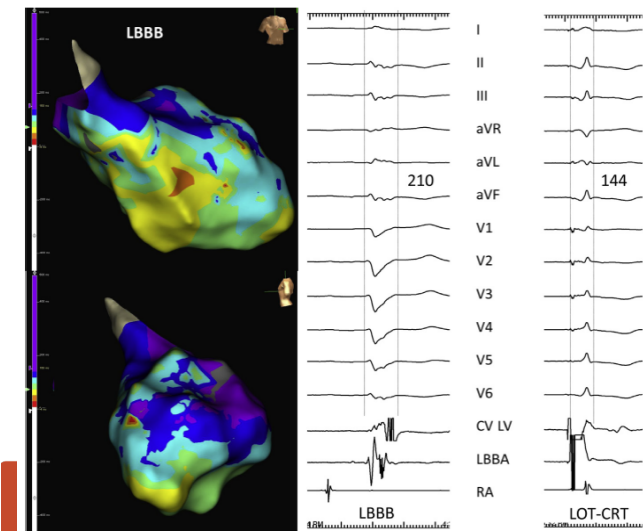
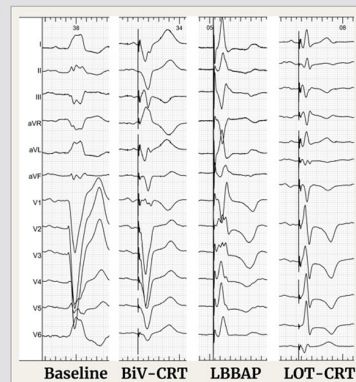
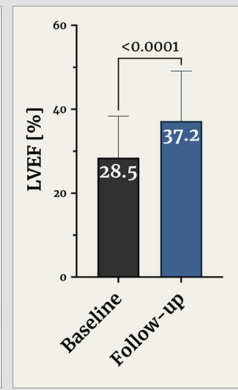
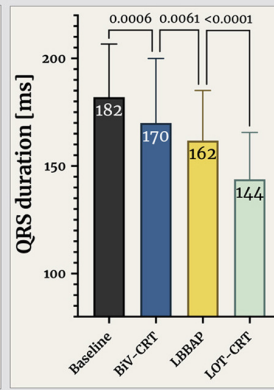
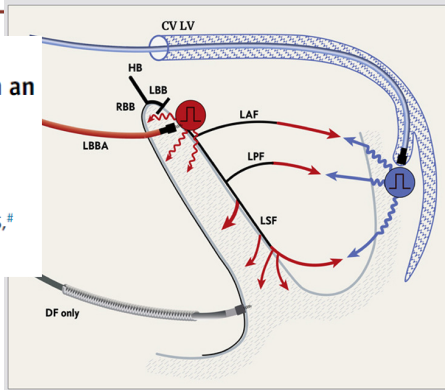
Wang Y, et al. J Am Coll Cardiol. 2022;80(13):1205-1216.

LOT-CRT

Left bundle branch area pacing (LBBAP) optimized CRT is feasible, safe and provides greater electrical resynchronization in comparison to BiV-CRT.

Left bundle branch-optimized cardiac resynchronization therapy (LOT-CRT): Results from an international LBBAP collaborative study group

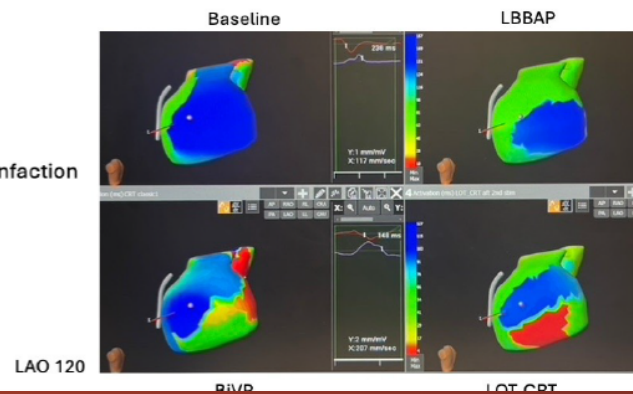
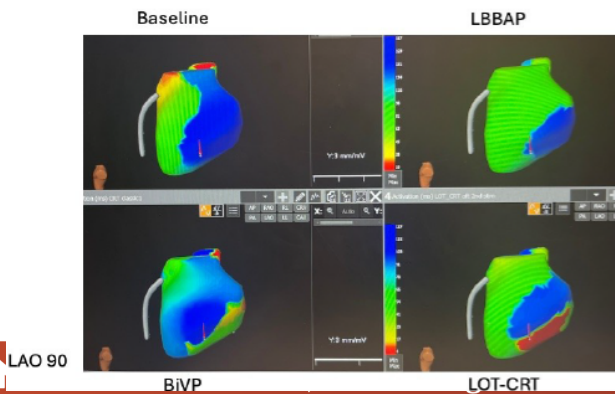
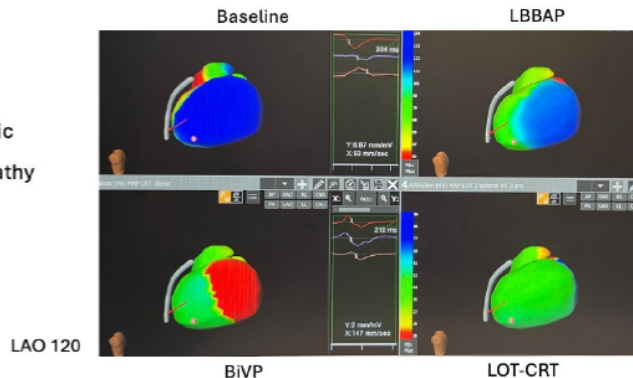
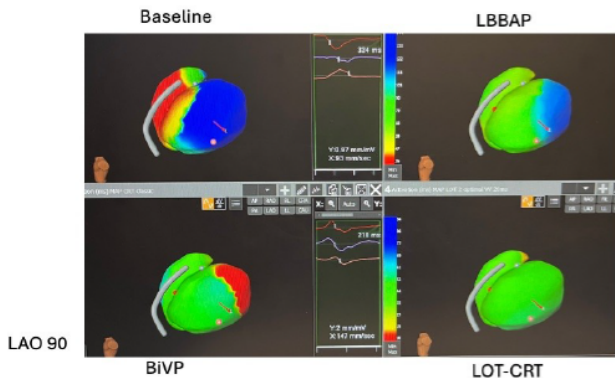
Marek Jastrzębski, MD, PhD,* Paweł Moskal, MD, PhD,*
Wim Huybrechts, MD,[†] Karol Curila, MD, PhD,[‡]
Praveen Sreekumar, MBBS, MD, DM,[§] Leonard M. Rademakers, MD, PhD,^{||}
Shunmuga Sundaram Ponnusamy, MBBS, MD, CEPS-A,* Bengt Herweg, MD, FHRS,*
Parikshit S. Sharma, MD, MPH, FACC, FHRS,*^{*} Agnieszka Bednarek, MD, PhD,*
Marek Rajzer, MD, PhD,* Pugazhendhi Vijayaraman, MD, FHRS^{††}



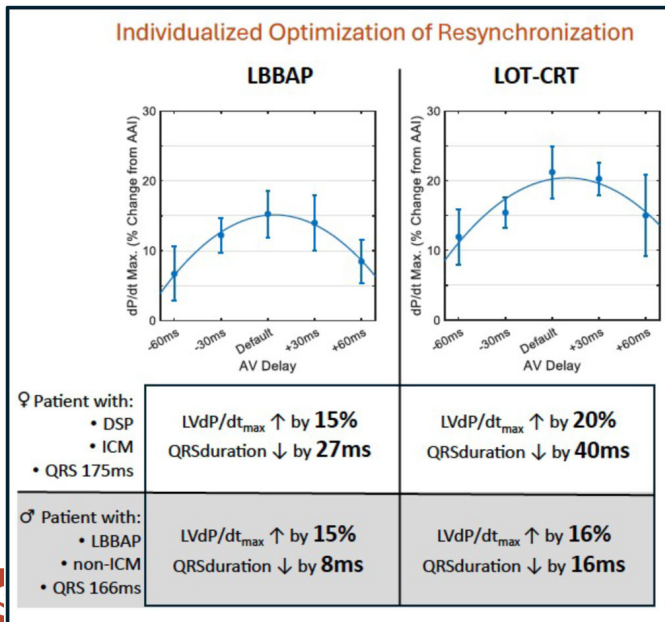
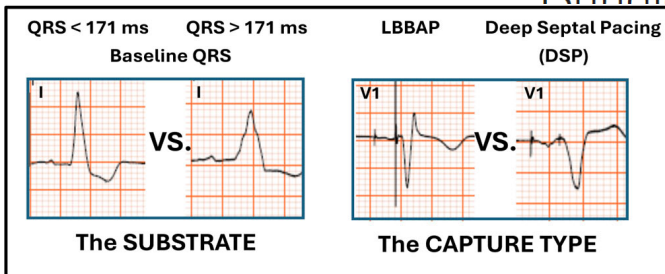
Conduction system pacing vs biventricular pacing vs optimized cardiac resynchronization therapy (LOT-CRT) for heart failure patients

Authors:

M Mazurek¹, E Jedrzejczyk-Patej¹, M Szulik¹, W Kowalska¹, A Suchodolski¹, A Sokal¹, R Lenarczyk¹, P Pruszkowska¹, S Piuta¹, O Kowalski¹, Z Kalarus¹, ¹Silesian Center for Heart Diseases (SCHD) - Zabrze - Poland,



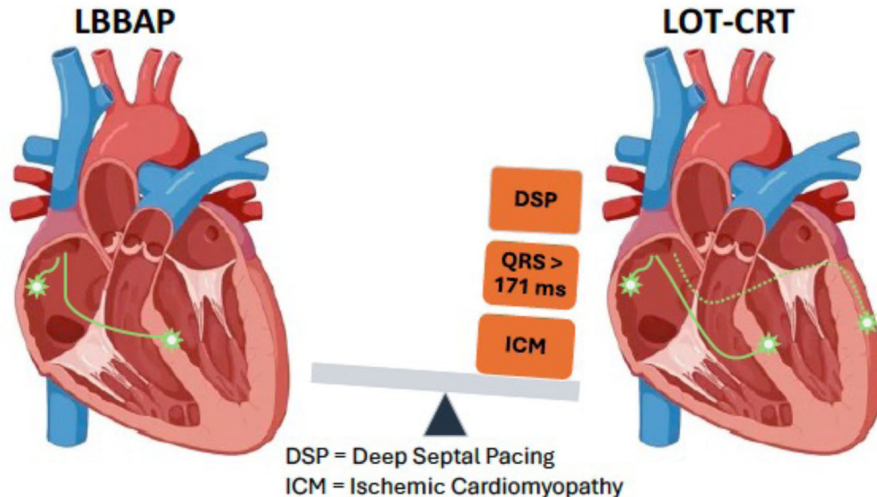
Multicenter Hemodynamic Assessment of the LOT-CRT Strategy: When Does Combining Left Bundle Branch Pacing and Coronary Venous



Combined Results

Patient population (N=48):

ICM (29%) versus NICM (71%); LBBB (40%) versus IVCD (60%); LBBAP (56%) versus DSP (44%); and Anodal capture (54%)



Conclusions: Subjects with suboptimal LBBAP (i.e., DSP), wider QRS, and ICM are more likely to benefit from LOT-CRT. Anodal capture is detrimental during LBBAP.

Patient:

Male, 74, FE 30%, NICD, NSPVT, LBBB, OMT, prolonged QTc

A) SINGLE CHAMBER ICD

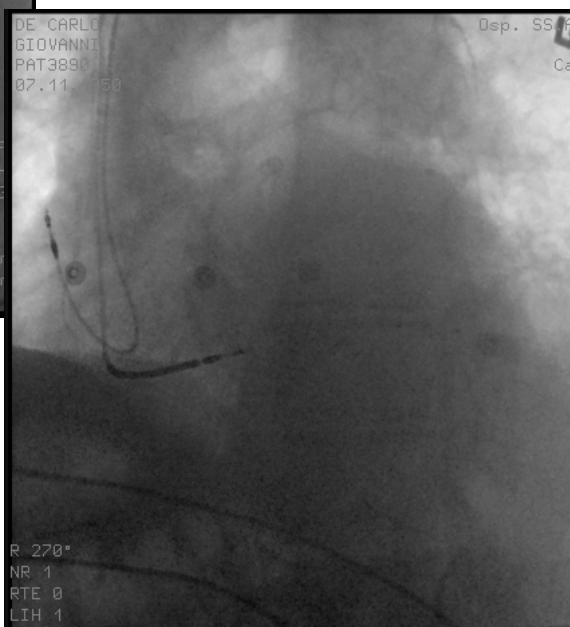
B) DUAL CHAMBER ICD

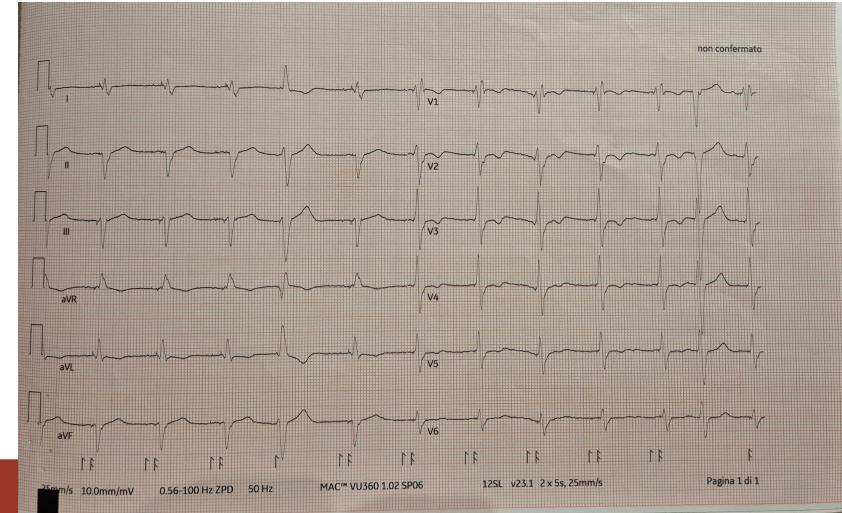
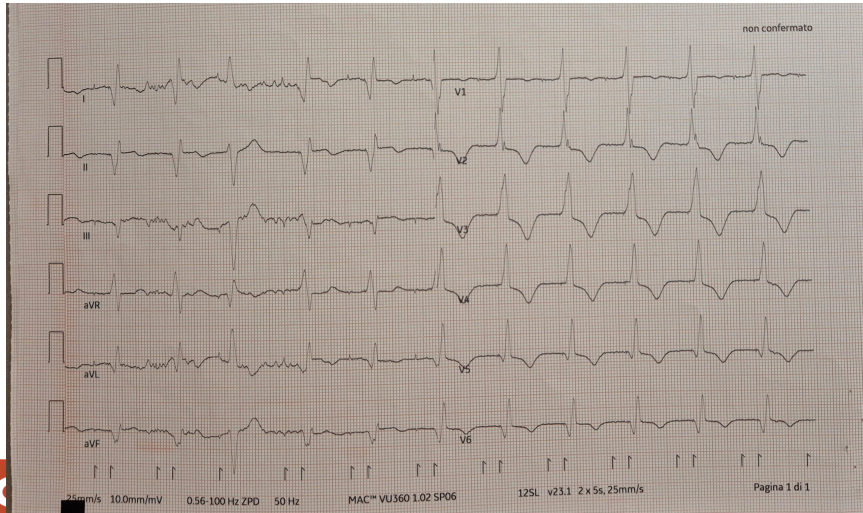
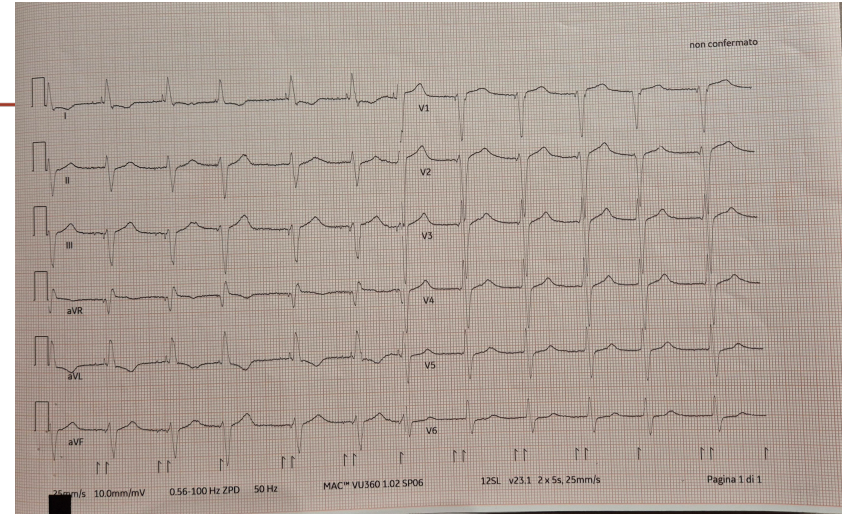
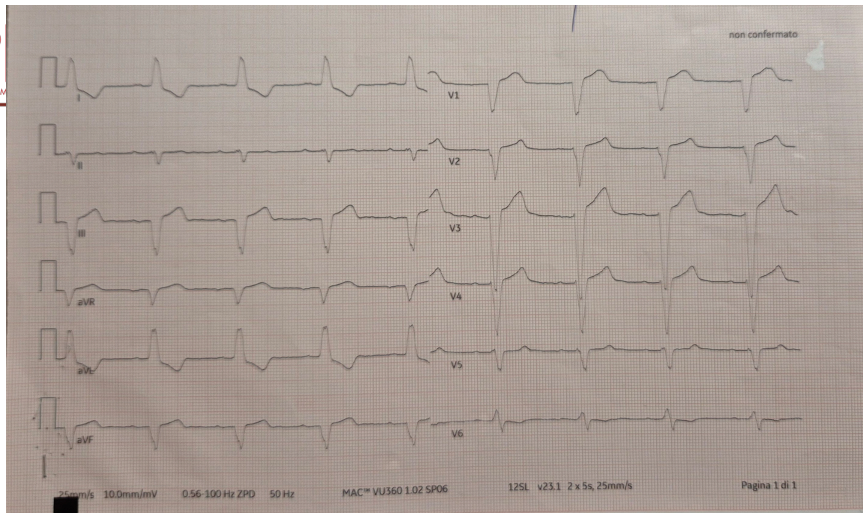
C) Biventricular CRT-D

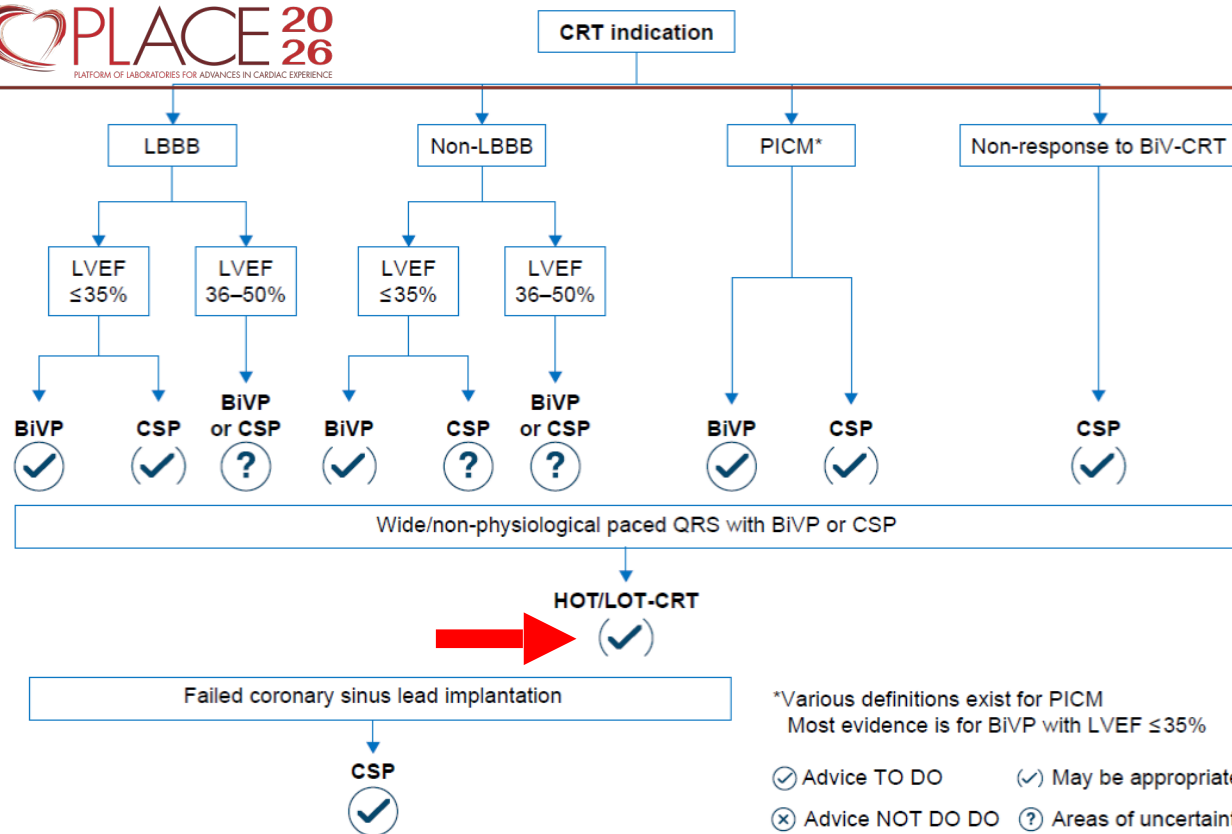
D) LBBAP CRT-D

E) LBBAD CRT-D









✓ **CSP and CRT**
joining
forces!

Figure 8 Indication for CSP-CRT. BiV-CRT, biventricular pacing cardiac resynchronization therapy; BiVP, biventricular pacing; CSP, conduction system pacing; HOT/LOT-CRT, His-optimized or left bundle-optimized cardiac resynchronization therapy; LBBB, left bundle branch block; LVEF, left ventricular ejection fraction; PICM, pacing-induced cardiomyopathy.



Patient:

Male, 48 yo, FE 35%,MNC, LBBB, OMT (3months WCD)

A)Single chamber ICD

B)EV ICD

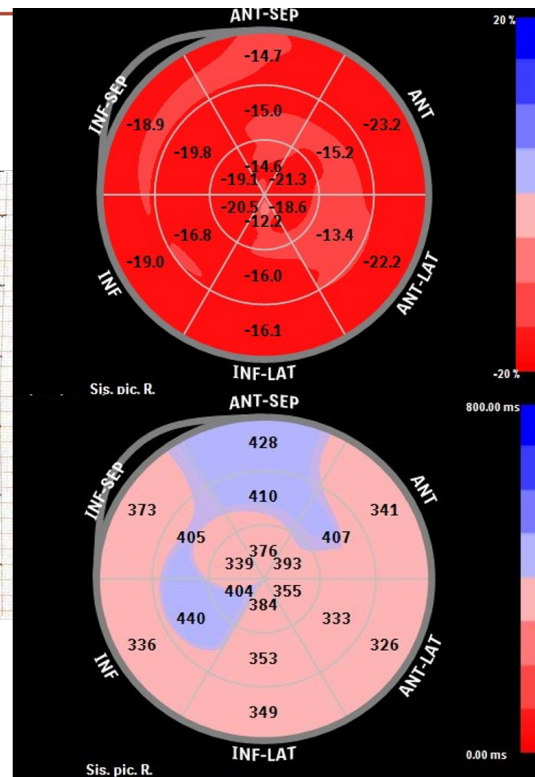
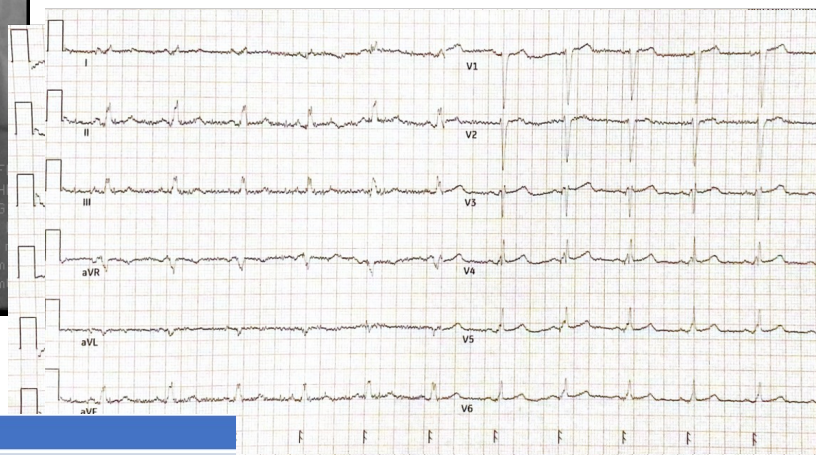
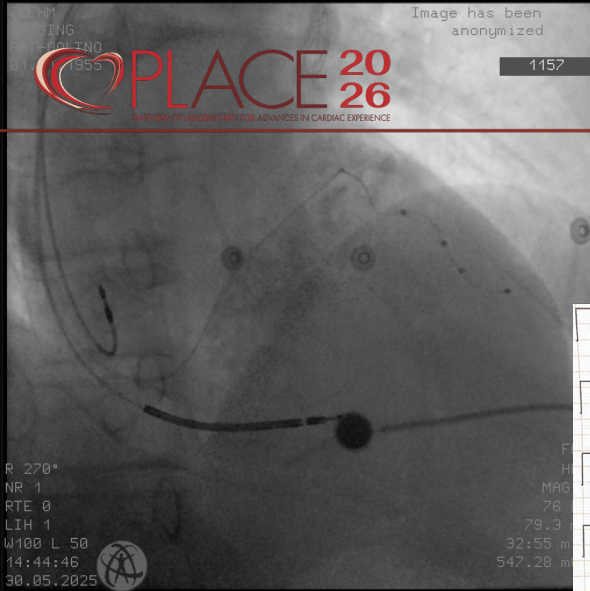
C) Biventricular CRT-D

D) LBBAP CRT-D

E) LBBAD CRT-D

F) LBBAD LOT-CRT-D





Parameter	Value
Pacing Mode	DDD
Lower Rate	45 bpm
AV-delay paced	130 ms
AV-delay sensed	110 ms
Ventricular stimulation	VS -> VD, 30 ms delay (VD represents LBBAP)
Biventricular pacing percentage	100% (at 1 month follow up)
Atrial threshold	0.75 V at 0.5 ms
LBBAP threshold	1 V at 0.5 ms
LV threshold	0.5 V at 0.5 ms



Table 2 Device and procedural characteristics

Device and lead type	
ICD: VR/DR/CRTD (%)	10/50/40
Abbott Durata / Medtronic Sprint	161/1/1
Quattro / MicroPort Invicta	
DF-4/DF-1 (%)	84/16
Single coil/dual coil (%)	99/1
Procedural data	
Success (%)	88
De novo/upgrade (%)	82/18
Left/right side (%)	94/6
LOT-CRT (%)	28
Number of screw-in attempts	2 (1–3)
Total procedure duration (min)	100 (59–140)
Fluoroscopy duration (min)	16 (9–27)
Defibrillation test performed*	85
Defibrillation test success (%)	100
Successful shock energy (J)	30 (25–30)
Fascicular potential (%)	3
QRS transition (%)	34

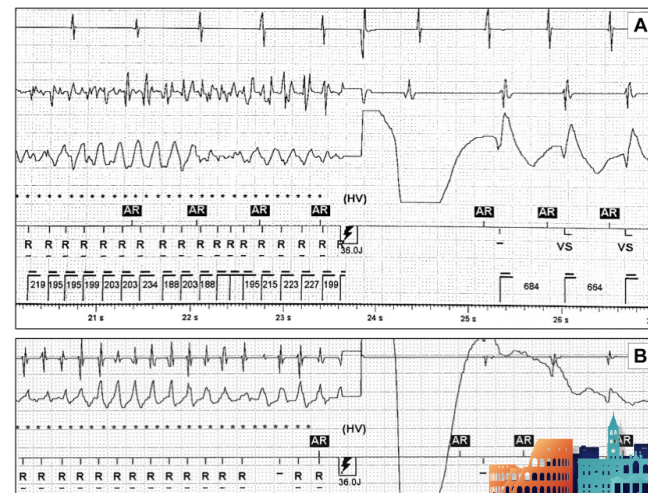
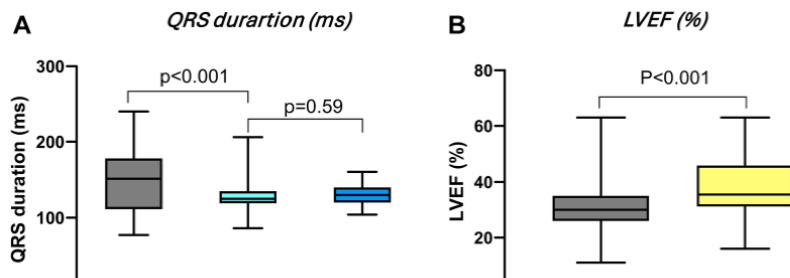
Implantation of standard defibrillator leads in the left bundle branch area: Experience from an international cohort

Guram Imnadze, MD, FESC, FEHRA,^{1,2} Cosimo Mandurino, MD,³ Ana Briski, MD,⁴ Ulhas Pandurangi, MD,⁵ Anindya Ghosh, MD,⁵ Shunmuga Sundaram Ponnusamy, MD,⁶ Francesca Notarangelo, MD,⁷ Antonio Crocamo, MD,⁷ Ehssan Berenjkoub, MD,⁸ Brian Vezi, MD,⁹ Kerstin Bode, MD, FEHRA, FESC,¹⁰ Christian Meyer, MD, FESC, FEHRA,⁴ Philipp Sommer, MD, FESC, FEHRA, FHRS,² Oscar Cano, MD,¹¹ Pugazhendhi Vijayaraman, MD, FHRS,¹² Haran Burri, MD, FESC, FEHRA¹³

Table 3 ECG and electrical parameters at implantation and after a follow-up of 8 months (3–13)

ECG and electrical parameters	Implantation	Follow-up	P value
r/R in V1 (%)	80	72	.14
V6 R-wave peak time (ms)	76 (70–85)	79 (69–86)	.55
V6–V1 interpeak interval (ms)	44 (45–54)	41 (34–51)	.34
QRS duration from onset (ms)	125 (119–135)	130 (120–140)	.59
Capture threshold (V/0.4 ms)	0.8 (0.5–1.1)	0.75 (0.5–0.75)	<.001
Sensing amplitude (mV)	9.0 (6.2–12)	11 (6.0–12.0)	.29
Pacing impedance (Ω)	580 (493–650)	430 (398–470)	<.001
High-voltage impedance (Ω)	66 (60–75)	63 (57–70)	.04

ECG = electrocardiogram.

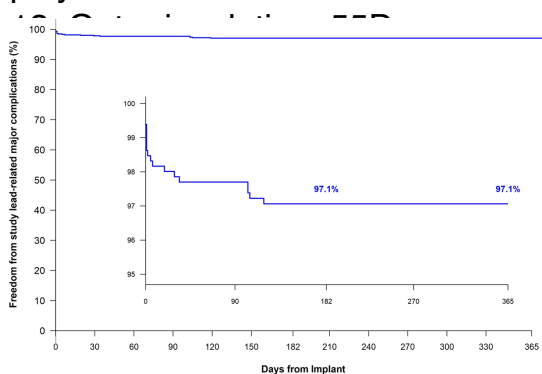
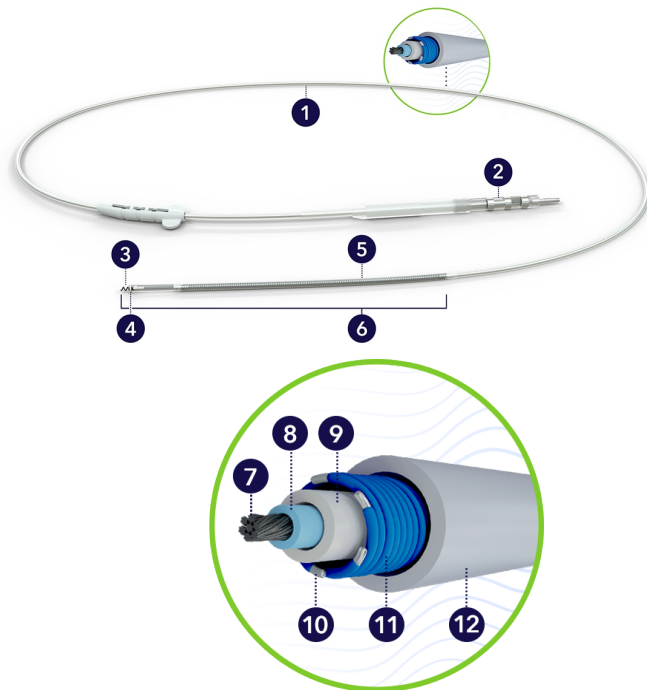




...e i materiali dedicati?



1. 4.7 Fr lead body
2. DF4 connector
3. Fixed helix
4. Steroid-eluting ring
5. Defibrillation coil
6. Integrated bipolar sensing
7. Conductor cable: MP35N
8. Inner insulation: ETFE
9. Inner insulation: silicone
10. Conductor coil: silver cored MP35N
11. Conductor coil insulation: Si polyimide



No. at Risk	657	634	616	615	607	605	600	528	518	515	507	504	361
No. of Events	4	14	15	15	19	19	19	19	19	19	19	19	19

HeartRhythm

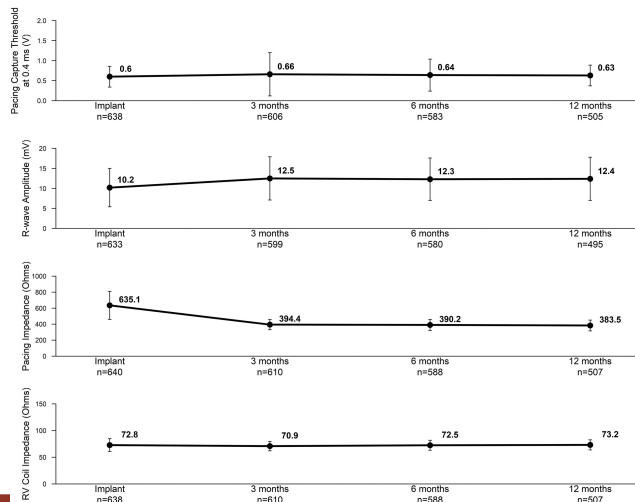
The Official Journal of the Heart Rhythm Society, The Cardiac Electrophysiology Society, and The Pediatric & Congenital Electrophysiology Society



Check for updates

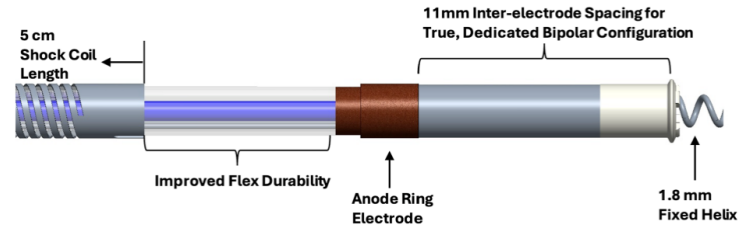
Safety, efficacy, and reliability evaluation of a novel small-diameter defibrillation lead: Global LEADR pivotal trial results

George H. Crossley III, MD, FHRS, CCDS,¹ Prashanthan Sanders, MBBS, PhD, FHRS,² Bert Hansky, MD,³ Paolo De Filippo, MD,⁴ Maully J. Shah, MBBS, FHRS, CCDS, CEPS-P,⁵ Morio Shoda, MD, PhD,⁶ Surinder Kaur Khelae, MBBS, FHRS,⁷ Travis D. Richardson, MD,¹ François Philippon, MD, FHRS,⁸ John S. Zakaib, MD,⁹ Hung-Fat Tse, MD, PhD,¹⁰ Darius P. Sholevar, MD,¹¹ Christoph Stellbrink, MD,¹² Rajeev K. Pathak, MBBS, PhD, FHRS,¹³ Goran Milasinović, MD,¹⁴ Jason S. Chinitz, MD, FHRS,¹⁵ Bernice Tsang, MD,¹⁶ Michael B. West, MD,¹⁷ Brian M. Ramza, MD, PhD,¹⁸ Xuebin Han, MD,¹⁹ Babak Bozorgnia, MD,²⁰ Roberto Carta, PhD,²¹ Tessa Geelen, PhD,²² Adam K. Himes, MS,²¹ Megan L. Platner, BS,²¹ Amy E. Thompson, MS,²¹ Pamela K. Mason, MD, FHRS,²³ for the Lead Evaluation for Defibrillation and Reliability Trial Investigators

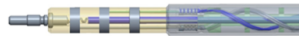


Safety and performance of a novel ICD lead for left bundle branch area pacing: Results from the ASCEND CSP trial

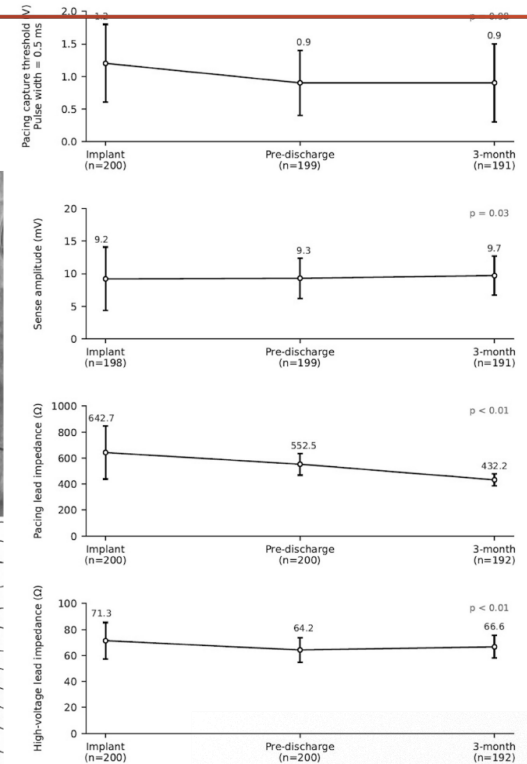
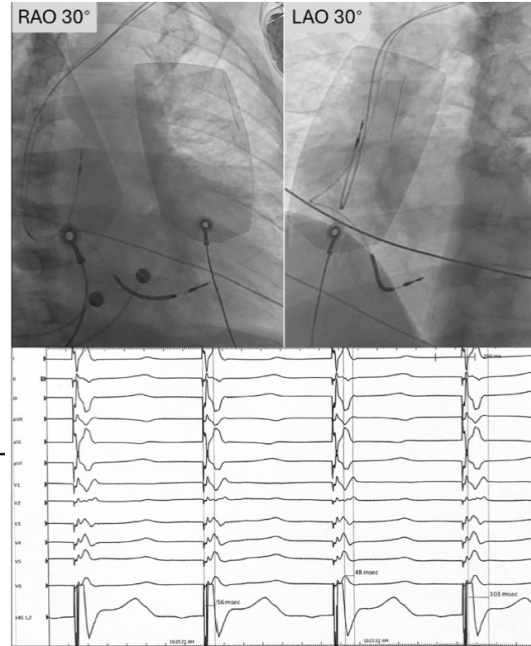
Robert D. Schaller, DO, FHRS,¹ Prashanthan Sanders, MBBS, PhD,² Jacqueline Joza, MD,³ Peter Zimetbaum, MD, FHRS,⁴ Ulrika Birgersdotter-Green, MD, FHRS,⁵ Roderick Tung, MD, FHRS,⁶ Balbir Singh, MD,⁷ Mark T.K. Tam, MBChB,⁸ Athanasios Thomaides, MD, FHRS,⁹ Devi Nair, MD, FHRS,¹⁰ Christophe Leclercq, MD,¹¹ Pugazhendhi Vijayaraman, MD, FHRS,¹² Cyrus A. Hadadi, MD,⁹ Jim Wiley, MS,¹³ Leonard Ganz, MD, FHRS,⁵ Lin Feng, PhD,¹³ Gayle Johnson, MPH,¹³ Kyungmoo Ryu, PhD,¹³ Robert Shaw, BS,¹³ Vishnu Charan, MS, MBA,¹³ Kwangdeok Lee, PhD,¹³ Haran Burri, MD,¹⁴ on behalf of the ASCEND CSP Investigators



LDA1122Q (with DF4 Connector)



LDA1122 (with DF-1 and IS-1 connectors)



Patient:

Male, 40 yo, FE 48%, DCM, IVCD, VF

A) Single chamber ICD

B) S-ICD

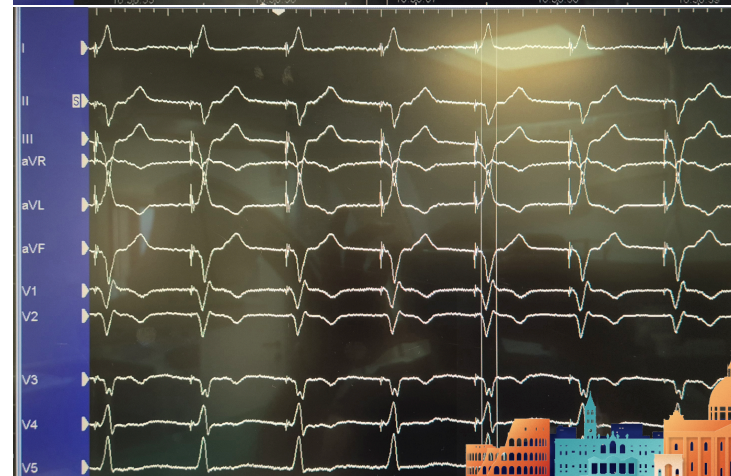
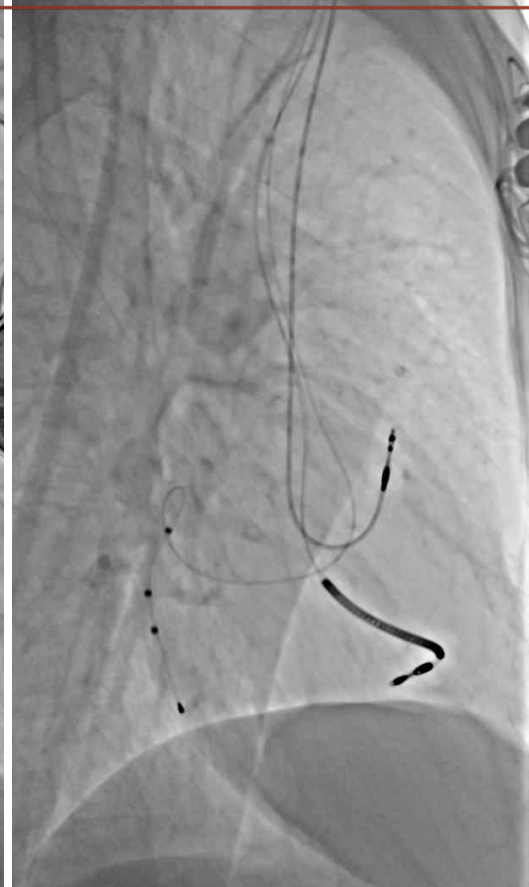
C) EV ICD

D) Biventricular CRT-D

E) LBBA-D

F) LBBAD LOT-CRT-D





Patient:

Female, 72 yo, FE 45%, ICD, history of VF, LBBB

A) S-ICD

B) Single chamber ICD

C) Dual chamber ICD

D) CRT-D

E) LBBA-D

F) (BB-)LOT CRT-D

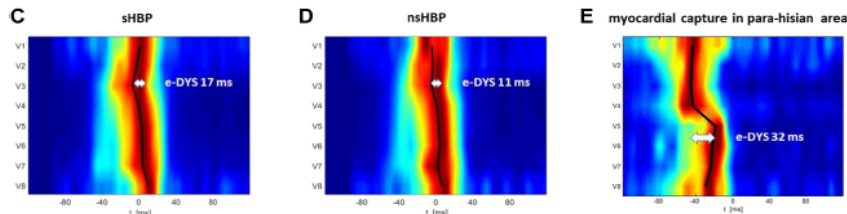




LBBAP: evidenze cliniche

CSP comprehensive update

Ultra High Frequency – ECG showing the electrical dyssynchrony (e-DYS) during different pacing modalities:

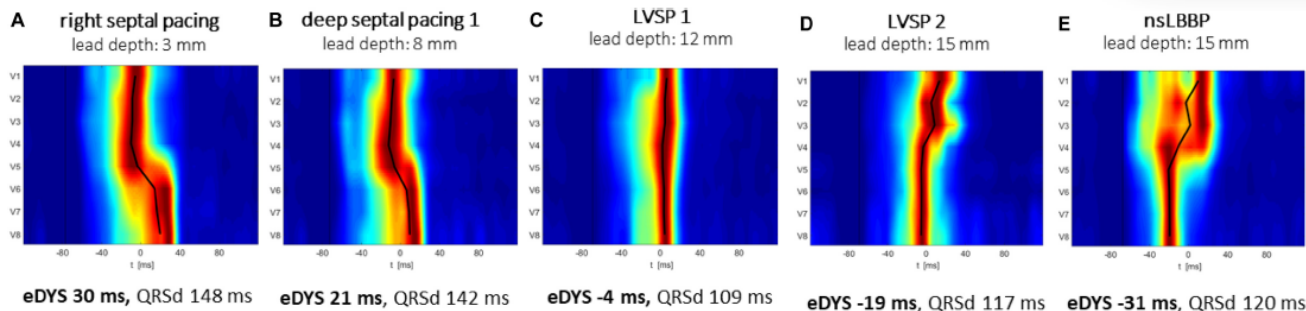


JACC: CLINICAL ELECTROPHYSIOLOGY
© 2023 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION
PUBLISHED BY ELSEVIER

STATE-OF-THE-ART REVIEW

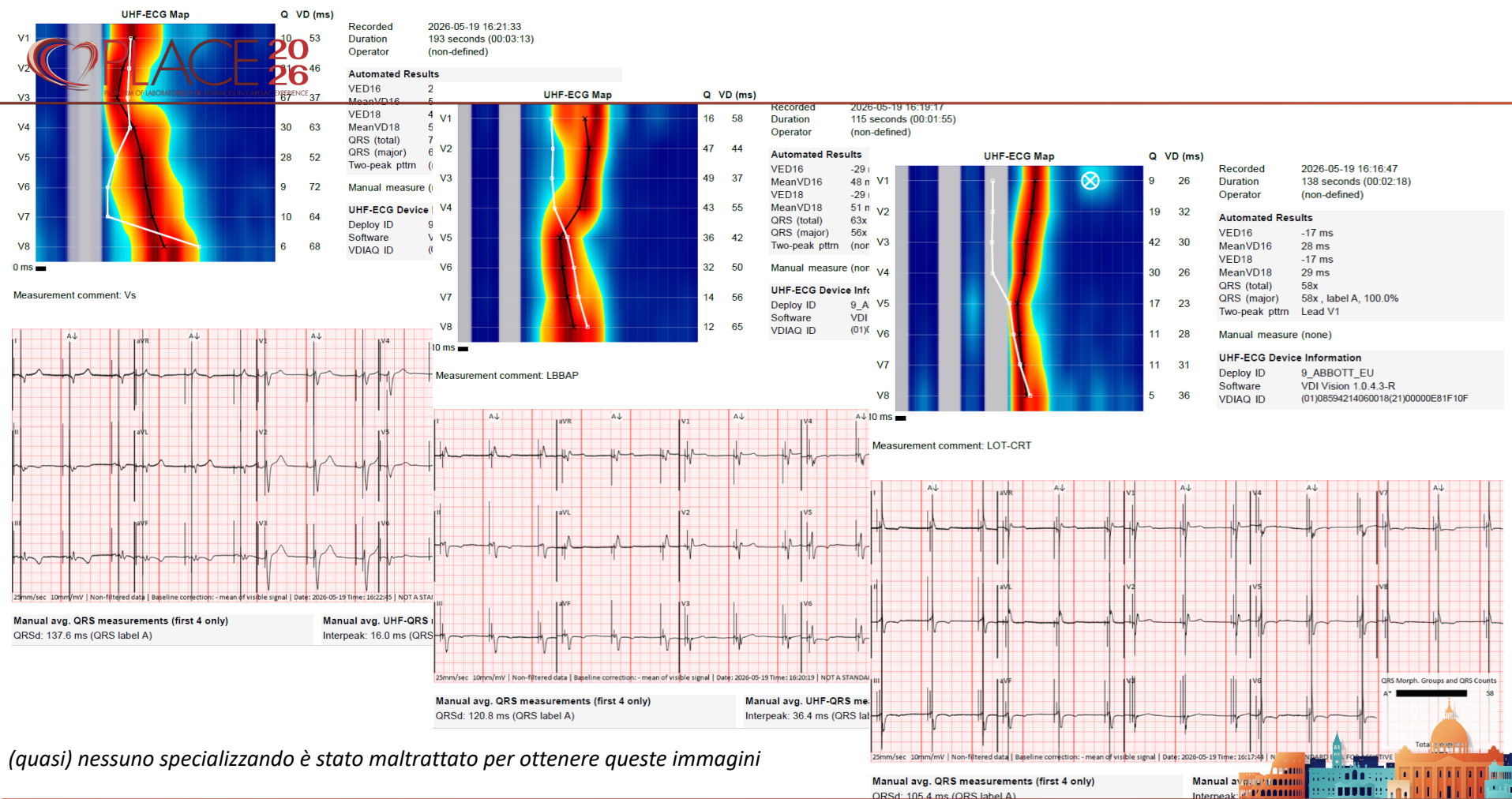
Cardiac Conduction System Pacing A Comprehensive Update

Pugazhendhi Vijayarajan, MD,¹ Mihal G. Chelu, MD, PhD,² Karol G. Carrillo, MD, PhD, MSc,³ Gopi Dandamudi, MD,⁴ Bengt Herweg, MD,⁵ Shunpei Mei, MD, PhD,⁶ Marek Jastrzebski, MD, PhD,⁷ Parikshit S. Sharma, MD, MPH,⁸ Kalyanam Shivkumar, MD, PhD,⁹ Roderick Tung, MD,¹⁰ Gaurav Upadhyay, MD,¹¹ Kevin Vernooij, MD, PhD,¹² Allan Weber-Frost, MD, MPH,¹³ Zachary Whinnett, MD,¹⁴ Francesco Zanon, MD,¹⁵ Kenneth A. Ellenbogen, MD¹⁶

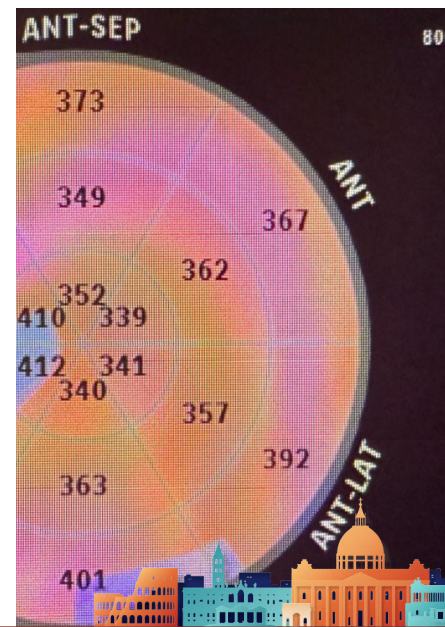
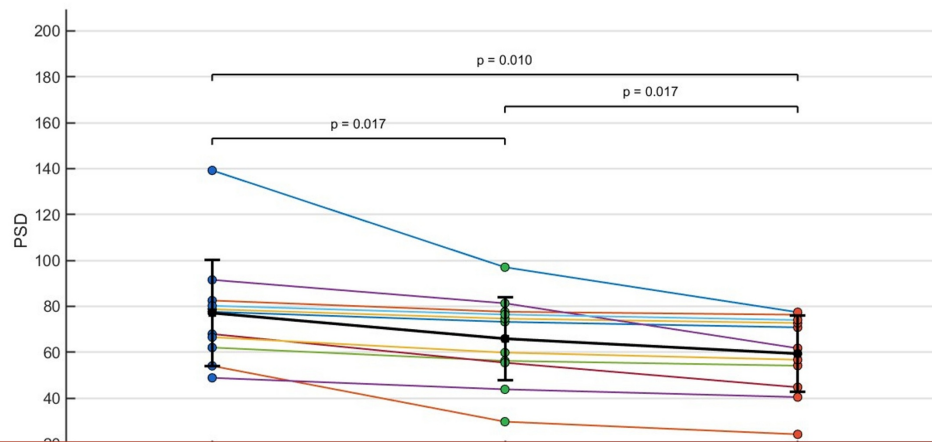
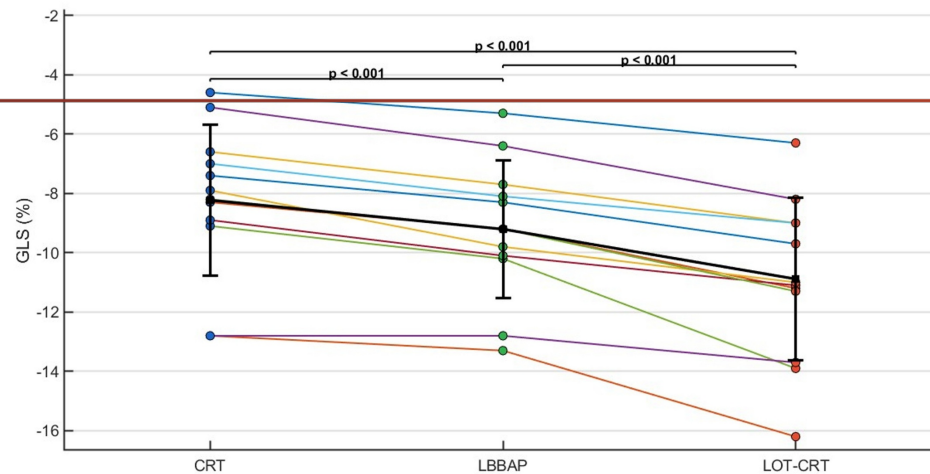
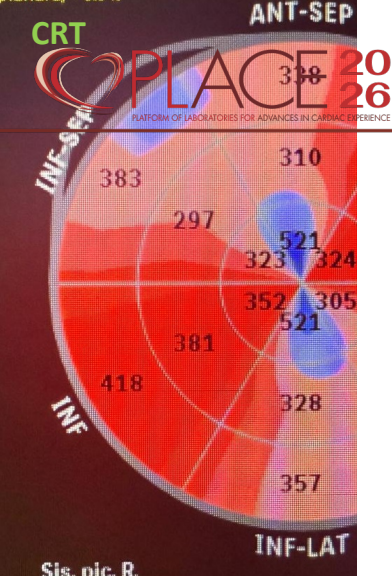


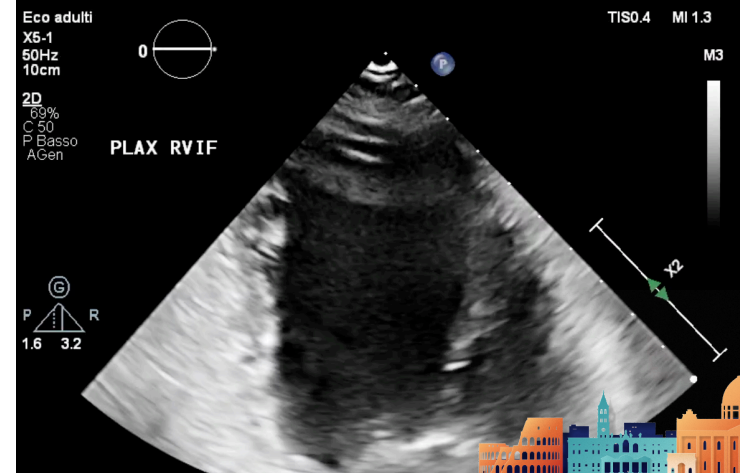
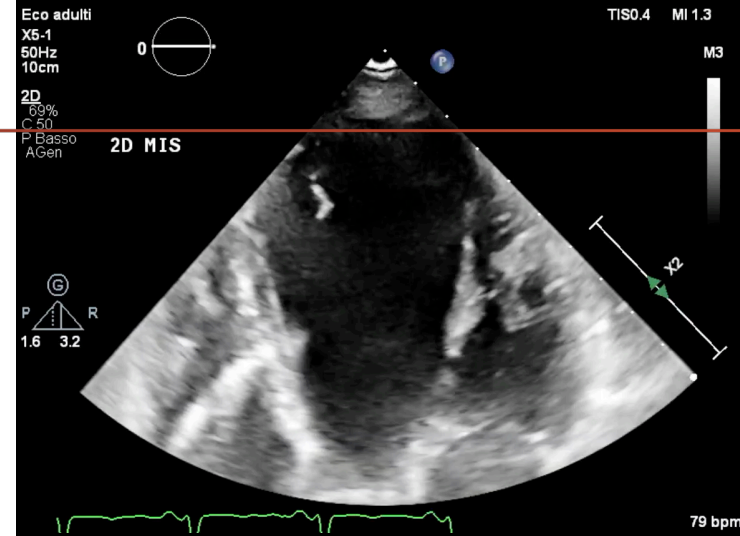
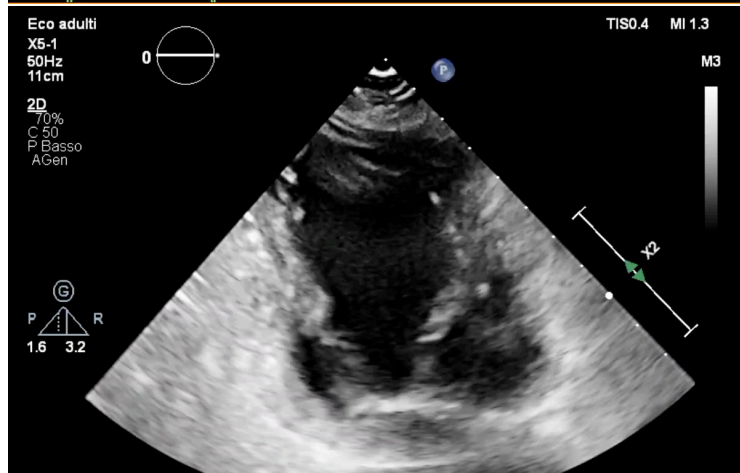
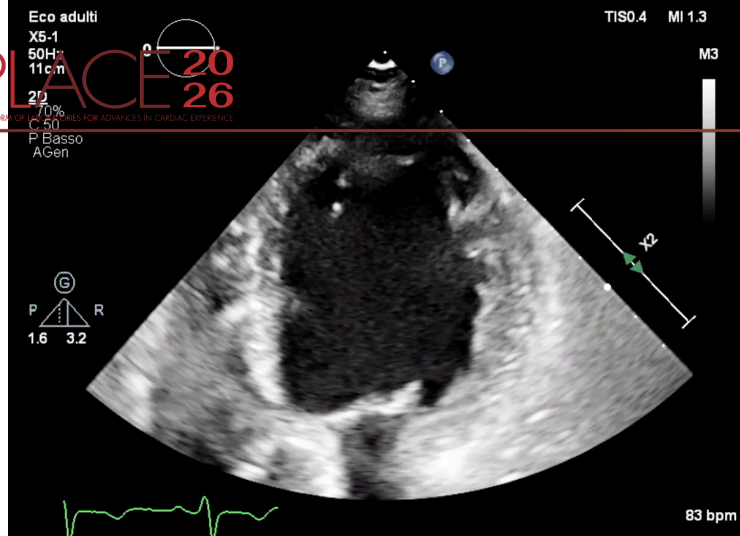
(A) Right septal pacing resulted in an electrical dyssynchrony (e-DYS) of 30 milliseconds caused by delayed left ventricular lateral wall activation. Left ventricular lateral wall delay and QRS duration (QRSd) were reduced when pacing at a depth of 8 mm (B), and the best interventricular synchrony with the shortest QRSd was observed at a depth of 12 mm during left ventricular septal pacing 1 (LVSP1) with a small late r in V₁ (C). Pacing at deeper positions during LVSP2 (which transitioned from nonselective left bundle branch pacing to the incremental output pacing) and nonselective left bundle branch pacing resulted in QRSd prolongation caused by the increase in left-to-right interventricular dyssynchrony with delayed right ventricular lateral wall activation (D,E).





(quasi) nessuno specializzando è stato maltrattato per ottenere queste immagini





Patient:

Female, 67 yo, FE 28%, 3rd degree AVB, history of AV replacement

A) Dual chamber ICD

B) Dx ICD

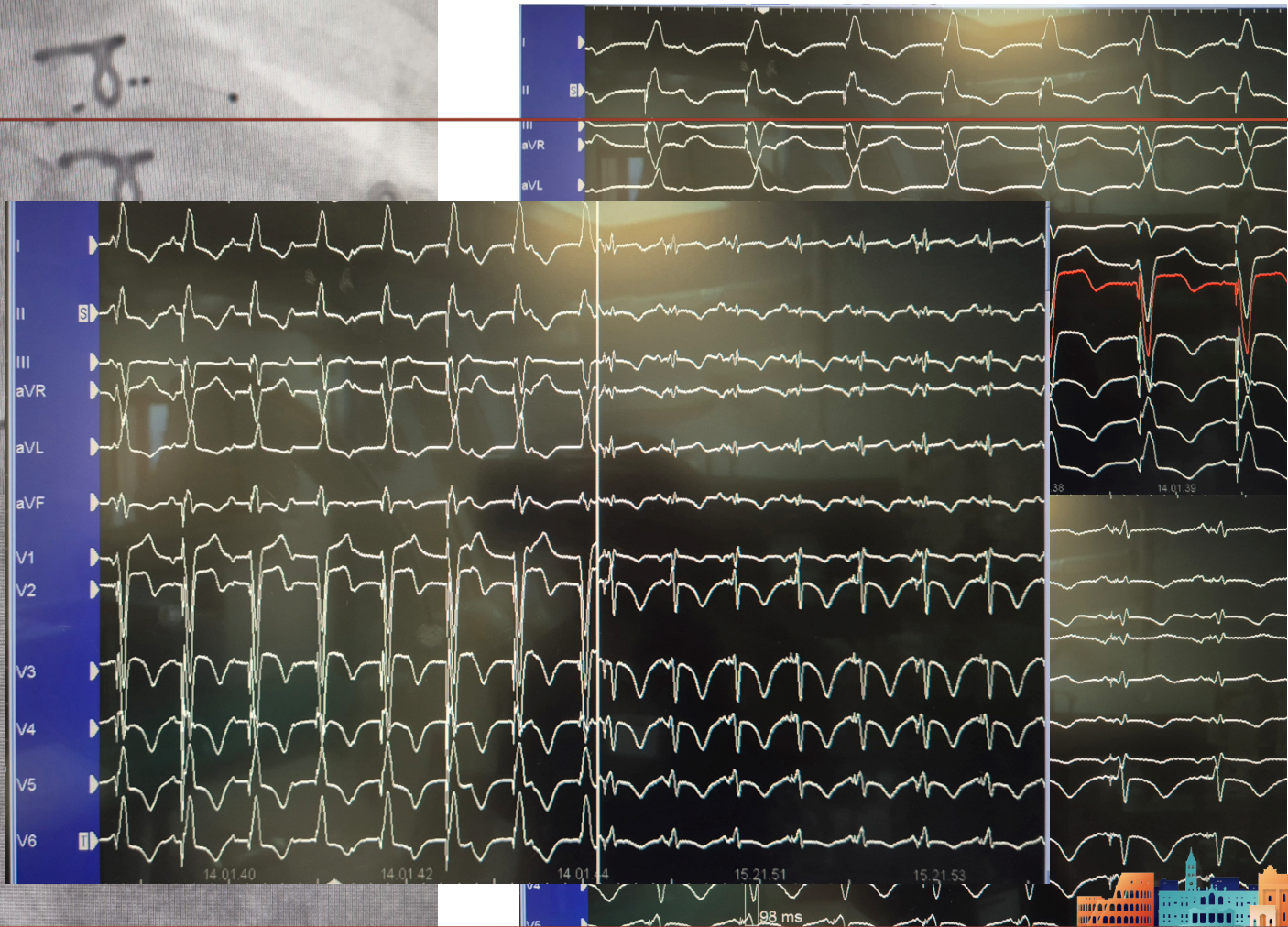
C) Dual chamber LBBA-D

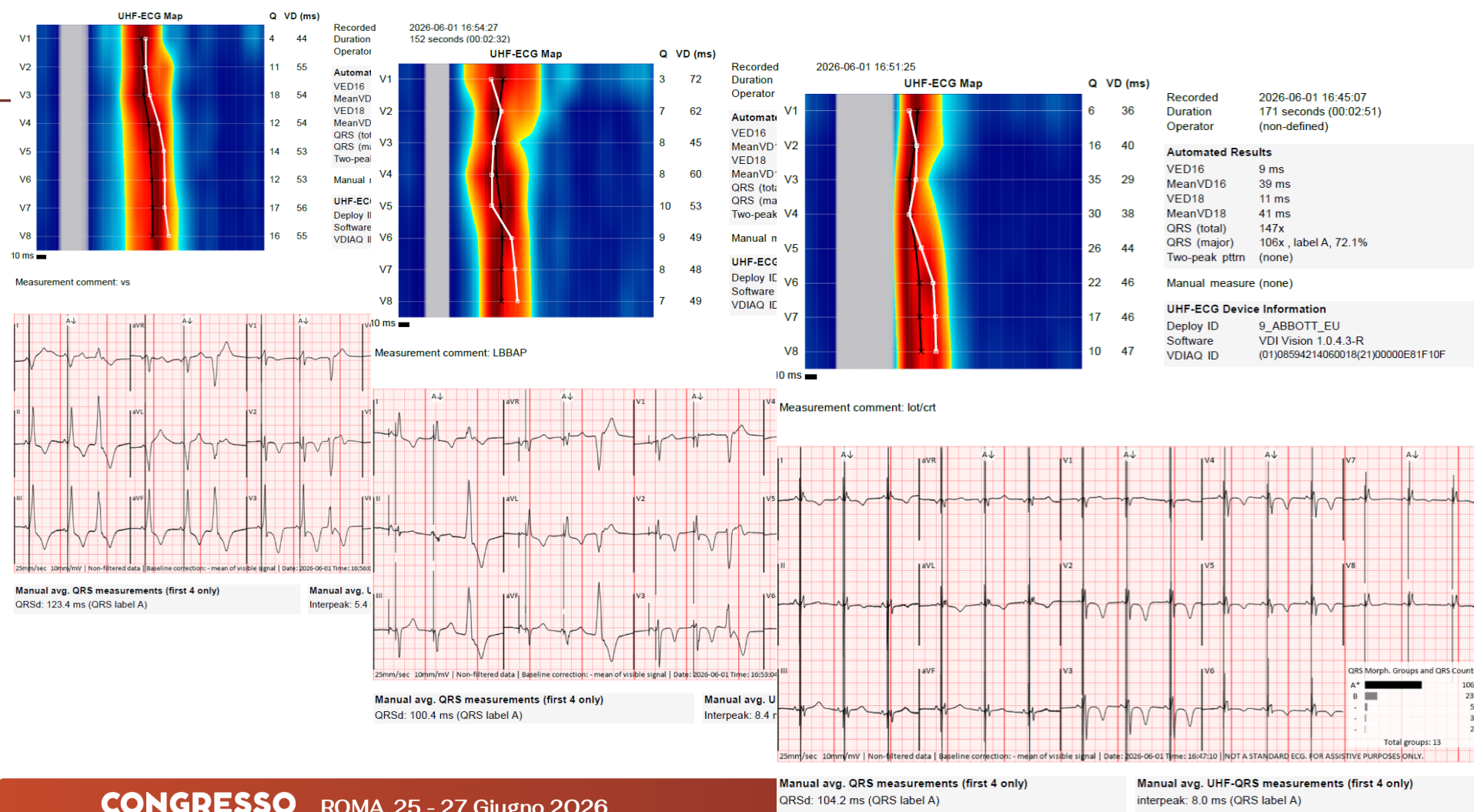
D) CRT-D

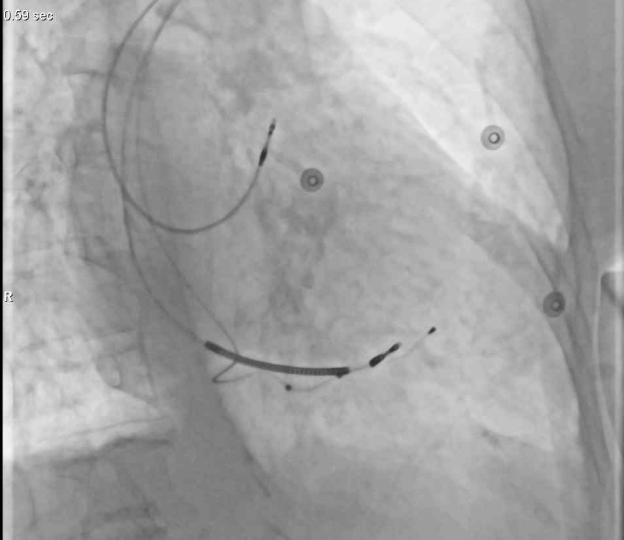
E) LOT CRT-D

F) BB-LOT CRT-D



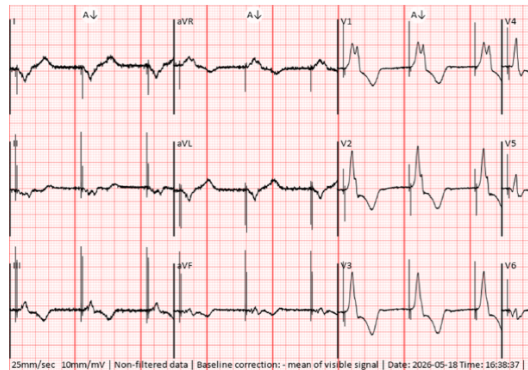
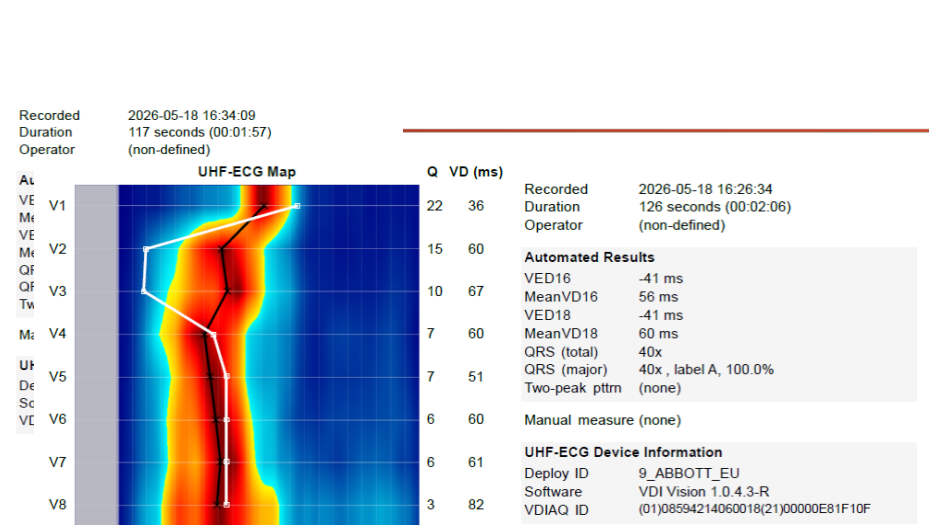
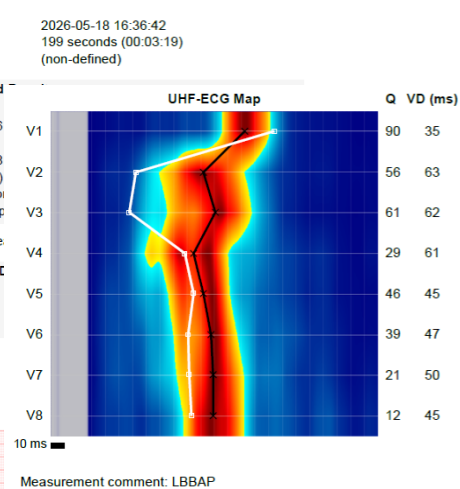
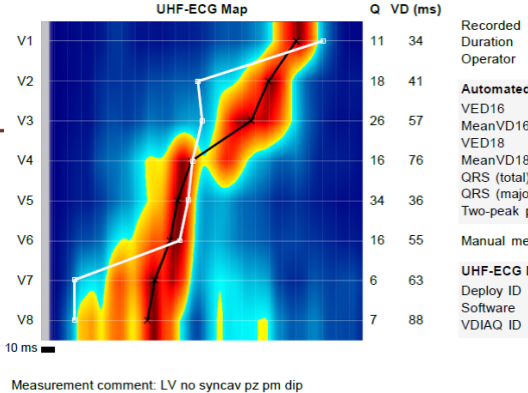






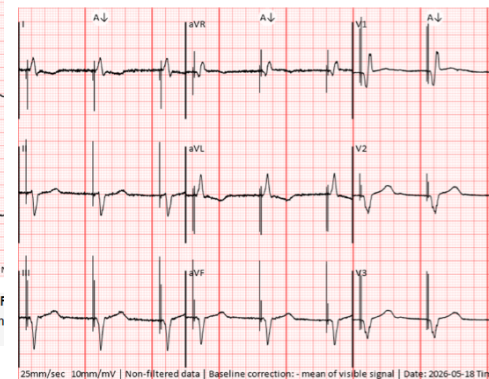
giugno 2026





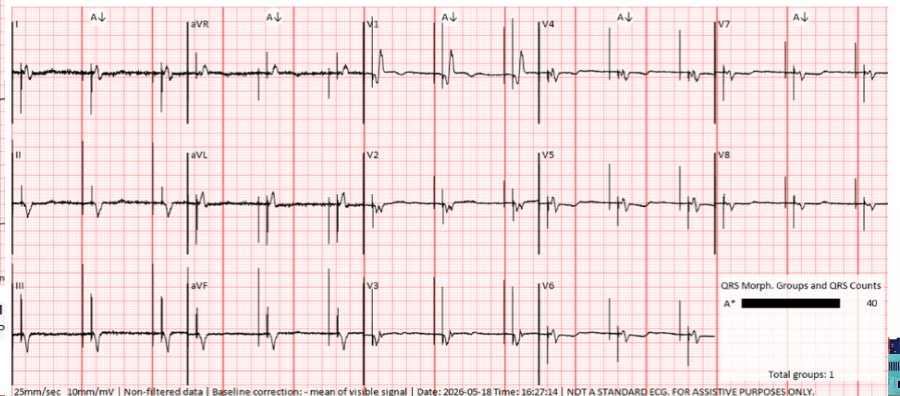
Manual avg. QRS measurements (first 4 only)
QRSd: 203.4 ms (QRS label A)

Manual avg. UHF
Interpeak: 91.2 ms



Manual avg. QRS measurements (first 4 only)
QRSd: 139.8 ms (QRS label A)

Manual INTERP



Manual avg. QRS measurements (first 4 only)
QRSd: 137.6 ms (QRS label A)

Manual avg. UHF-QRS measurements (first 4 only)
Interpeak: 29.0 ms (QRS label A)

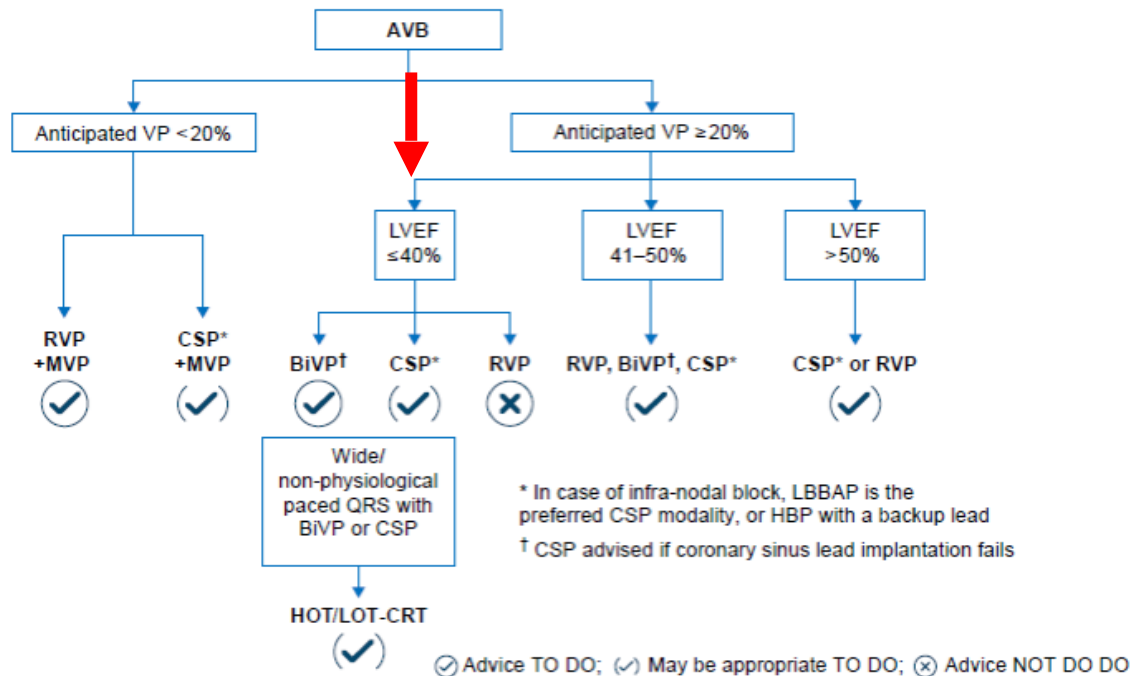


Figure 5 Summary of CSP indications in AVB. AVB, atrioventricular block; BiVP, biventricular pacing; CSP, conduction system pacing; HBP, His bundle pacing; HOT/LOT-CRT, His-optimized or left bundle-optimized cardiac resynchronization therapy; LBBAP, left bundle branch area pacing; LVEF, left ventricular ejection fraction; MVP, minimized ventricular pacing; RVP, right ventricular pacing.

European Society of Cardiology (ESC) clinical consensus statement on indications for conduction system pacing, with special contribution of the European Heart Rhythm Association of the ESC and endorsed by the Asia Pacific Heart Rhythm Society, the Canadian Heart Rhythm Society, the Heart Rhythm Society, and the Latin American Heart Rhythm Society



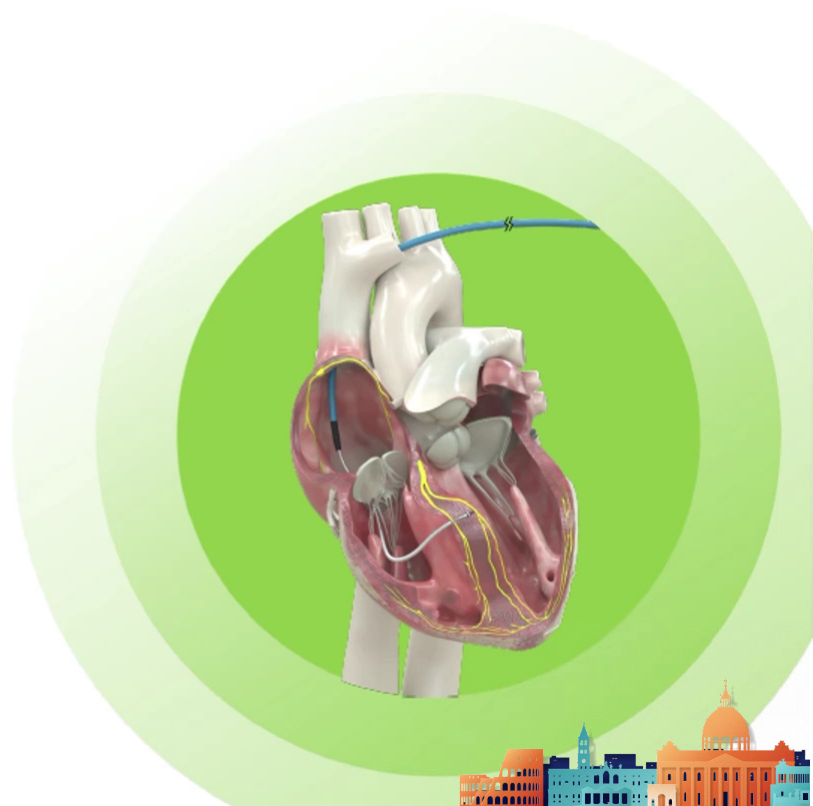
The OmniaSecure™ lead shows improvement in outcomes for heart failure patients receiving LOT-CRT

OmniaSecure™ LEADR LBBAP Global Trial

At six months, patients treated with the three-lead LOT-CRT configuration demonstrated¹

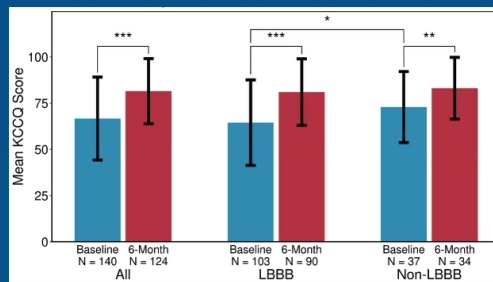
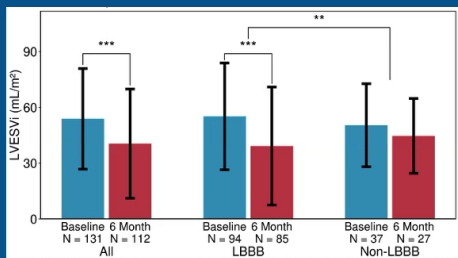
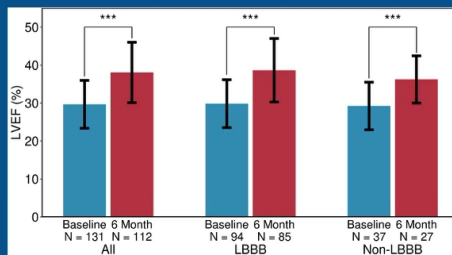
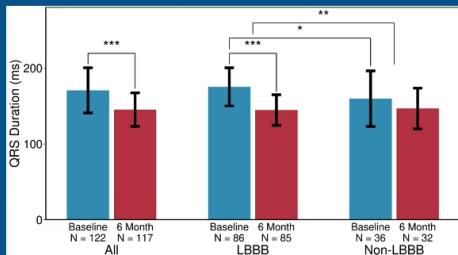
- A decrease in QRS duration
- A decrease in LVESVi
- An increase in LVEF

These results are consistent with previously published findings.
85% of patients receiving LOT-CRT either improved or maintained QOL scores.¹



LEADR LBBAP: Longer-term Safety, LOT-CRT

- 143 pts. LOT-CRT: 24.4ms reduction in QRS duration



*: p<0.05
**: p<0.01
***: p<0.001

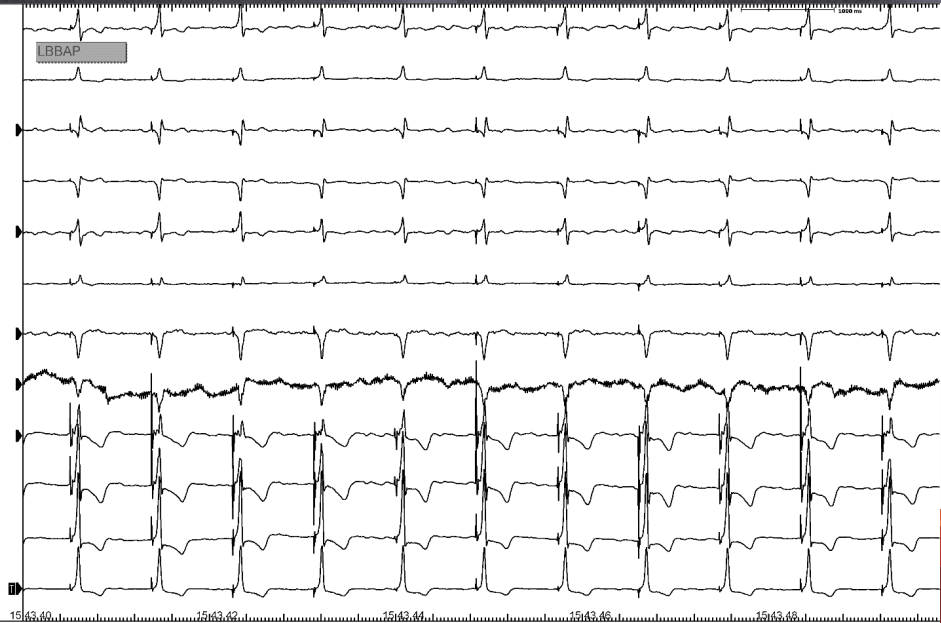
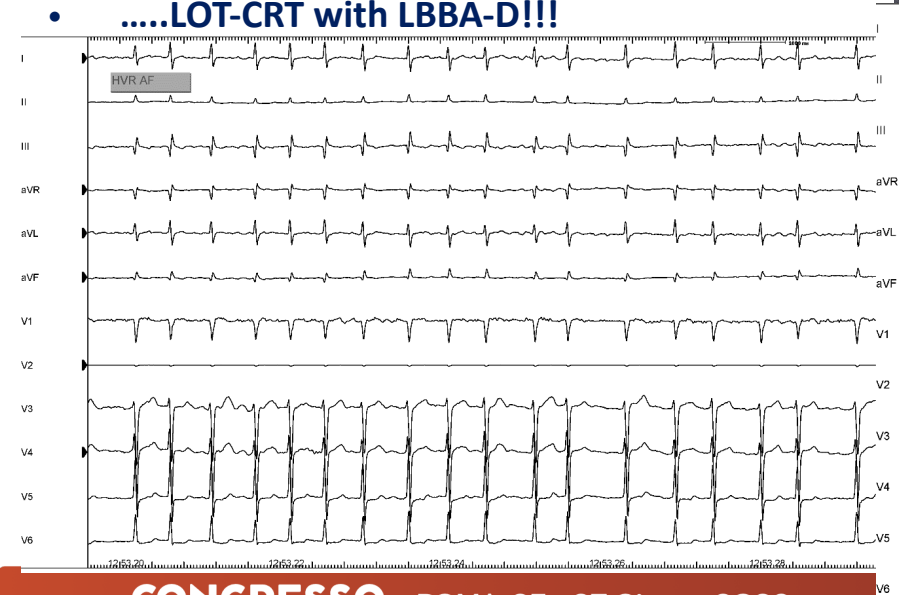
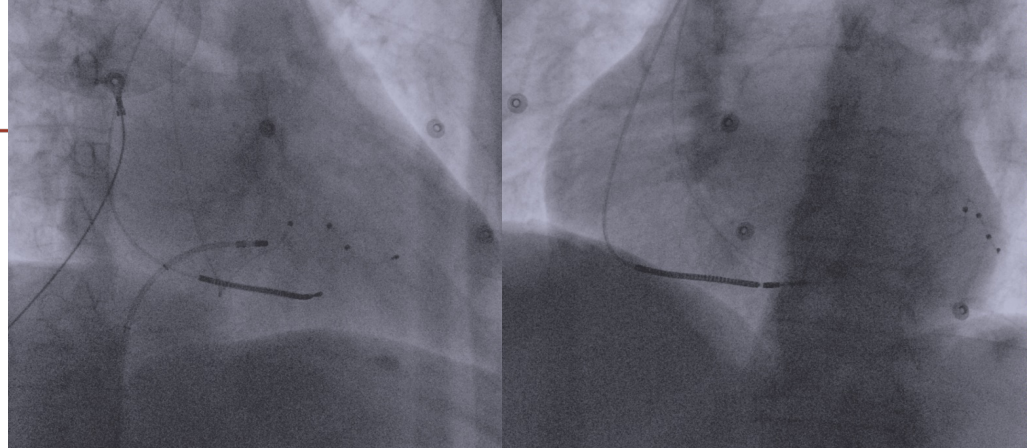
Vijayaraman P. Presented as an abstract EN-527958-005 at the HRS congress 2026 in Chicago

Medtronic

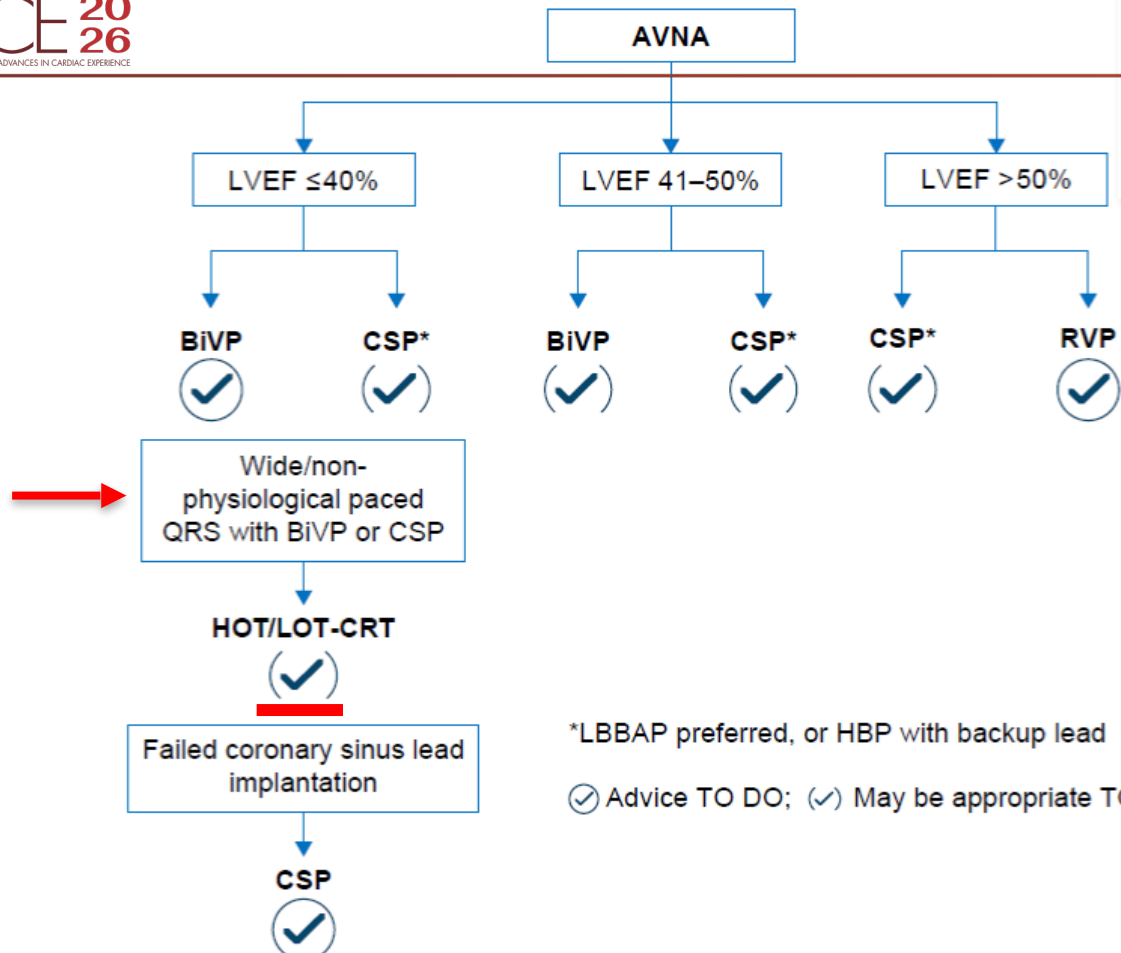


Male, 63 yo

- 30% EF, HVR AF
- 1 year of OMT (Methoptolol 200mg/die & Digoxin 0,250 mg&die)
- NYHA III
- CRT-D implantation & AVJ ablation
- **.....LOT-CRT with LBBA-D!!!**



European Society of Cardiology (ESC) clinical consensus statement on indications for conduction system pacing, with special contribution of the European Heart Rhythm Association of the ESC and endorsed by the Asia Pacific Heart Rhythm Society, the Canadian Heart Rhythm Society, the Heart Rhythm Society, and the Latin American Heart Rhythm Society



✓ **LOT-CRT**
indicated in
ablate&pace!

*LBBAP preferred, or HBP with backup lead

⊙ Advice TO DO; (✓) May be appropriate TO DO



Patient:

Male, 84 yo, FE 40%, ICD, SSS+HVR paroxysmal AF, IVCD

A) Atrial leadless pacemaker

B) Dual chamber pacemaker

C) Dual chamber LBBAP pacemaker

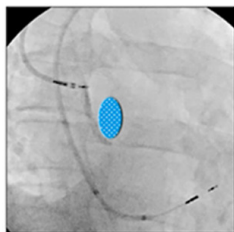
D) CRT-P

E) LOT CRT-P

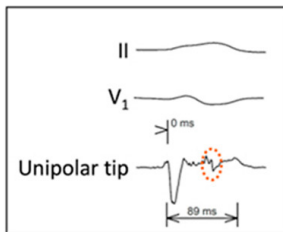
F) BB-LOT CRT-P



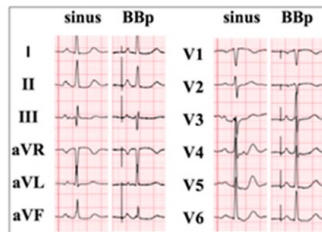
1) Fluoroscopic target area
SVC – RA Junction



2) Electrogram target
Low amplitude high dV/dt EGM
timing well within the P wave



3) Pace-map using 12 lead
Narrow, normal axes P wave



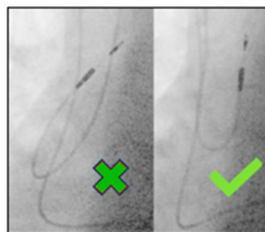
4) Sheath apposition
Good tissue contact if the sheath
pushes back as the lead is advanced



5) Sheath withdrawal
Lead forms a U-shape



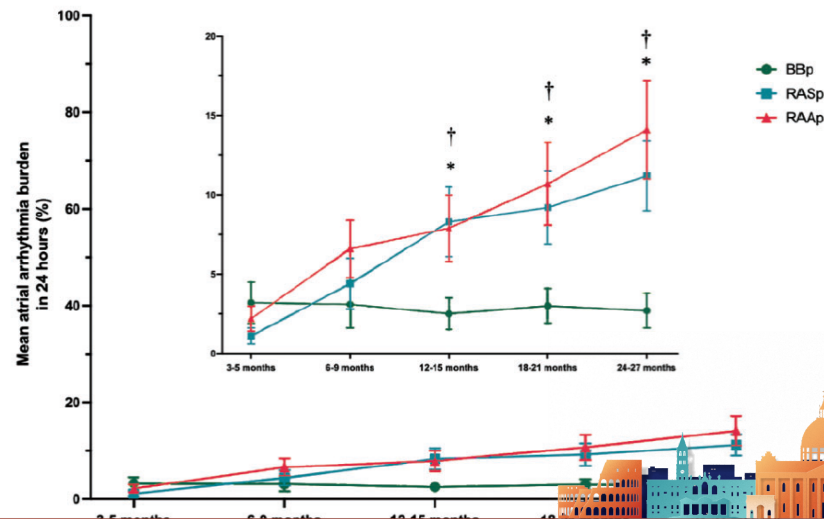
6) Untwisting the lead
90-180° CCW rotation for
stability & proper sensing

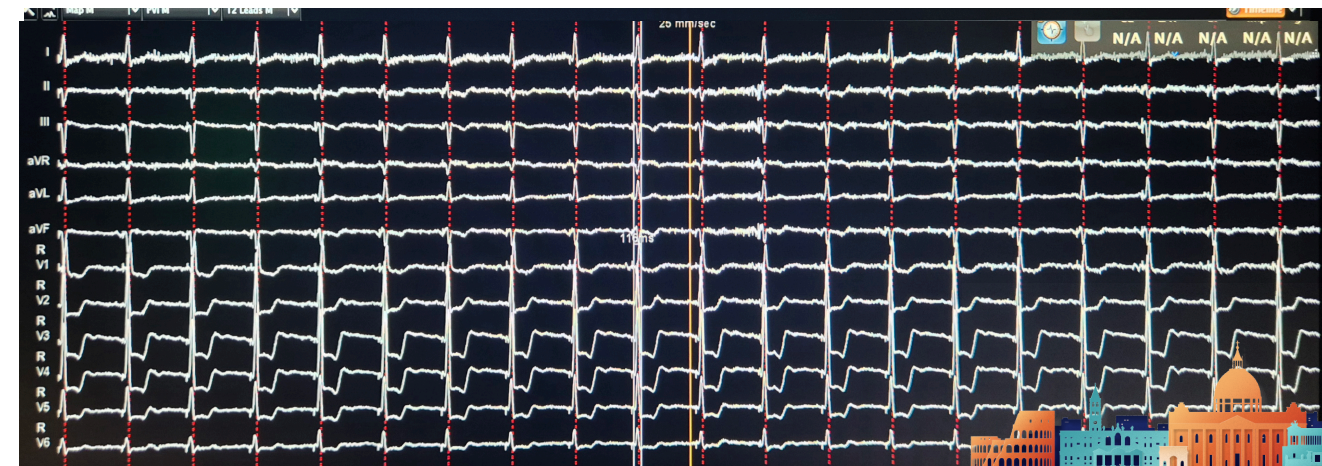
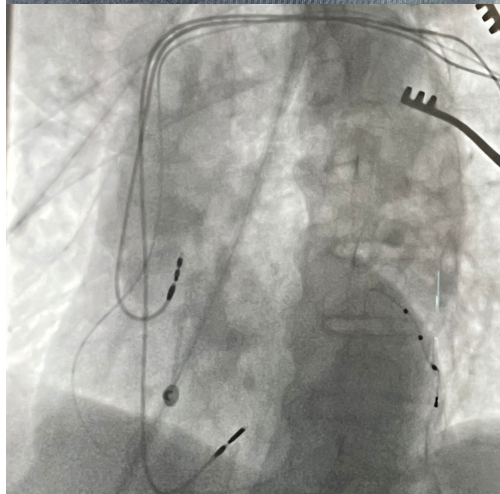


Clinical impact of Bachmann's bundle pacing defined by electrocardiographic criteria on atrial arrhythmia outcomes

Margaret Infeld^{1*}, Charles D. Nicol¹, Sean Meagher¹, Bradley J. Tompkins¹, Shawn Wayne¹, Benjamin Irvine², Omkar Betageri³, Nicole Habel¹, Sean Till¹, Jennings Lobel¹, Markus Meyer⁴, and Daniel L. Lustgarten¹

Daily Atrial Arrhythmia Burden over Follow-up





*...dovremmo smettere di affermare che l'una è alternativa all'altra!
... Altrimenti che fate? Vi arrabbiate?*

