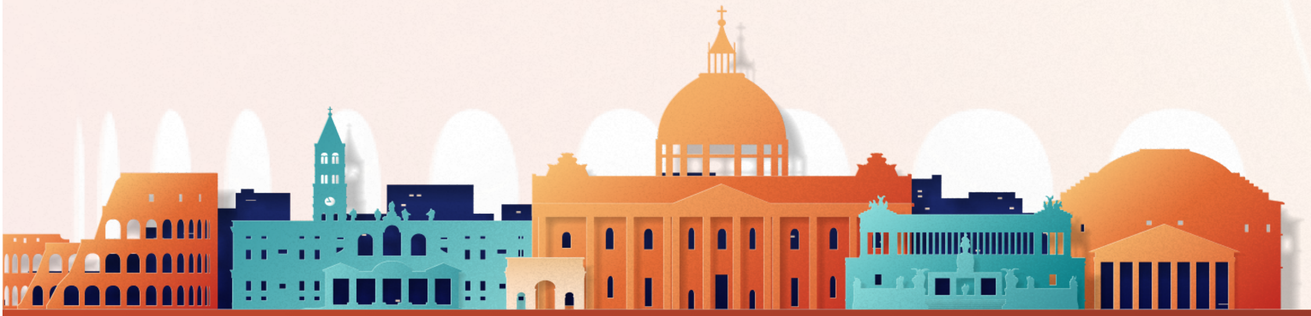
PLACE 2026
PLATFORM OF LABORATORIES FOR ADVANCES IN CARDIAC EXPERIENCE

CONGRESSO
ROMA, 25 - 27 Giugno 2026

HOT TOPICS IN CARDIAC PACING

Beyond Tradition: Choosing Between Conduction System Pacing and Leadless Pacing



Manuel Molina-Lerma

Practical considerations

The choice between these technologies depends on several factors:

- Need for atrioventricular (AV) synchrony: Conduction system pacing (CSP) preserves physiological cardiac activation, whereas leadless pacing (LP) was initially limited to ventricular pacing.
- Expected pacing burden: CSP is preferable in patients anticipated to require >40% ventricular pacing, owing to its ability to maintain physiological ventricular activation and reduce pacing-induced dyssynchrony
- Venous access: LP may be advantageous in patients with venous occlusion or a history of device-related infection.
- Ventricular function: CSP is generally preferred in patients with ventricular dysfunction or those at increased risk of developing heart failure.

LL pacemaker indication

“Secondary prevention”

- Previous CIED infection
- Absence of upper venous access
- CIED pocket erosion
- Lead fracture

“Primary prevention”

- High infection risk
- High haematoma risk
- Severe frailty
- Severe TR

NO SUITABLE FOR CSP

HAEMODIALYSIS
MECHANICAL PROSTHETIC HEART VALVES
LEAD FRACTURE

PREVIOUS INFECTION
LACK OF VASCULAR ACCESS
COMPLEX CONGENITAL HEART DISEASE

Clinical implications

Clinical Scenario	Preferred Strategy	Economic Rationale
Previous cardiac device infection	Leadless pacemaker	Avoids pocket- and lead-related complications, reducing rehospitalizations and associated costs.
Limited or absent venous access	Leadless pacemaker	Eliminates the need for complex venous interventions and their associated costs.
Hemodialysis patients	Leadless pacemaker	Lower infection risk and preservation of vascular access may improve long-term cost-effectiveness.
High risk of pocket hematoma or frailty	Leadless pacemaker	Reduced procedural complications and shorter hospital stays may offset higher device costs.
Standard-risk patients with uncomplicated venous access	Individualized decision	Economic advantage is less pronounced and depends on local healthcare economics and device pricing.

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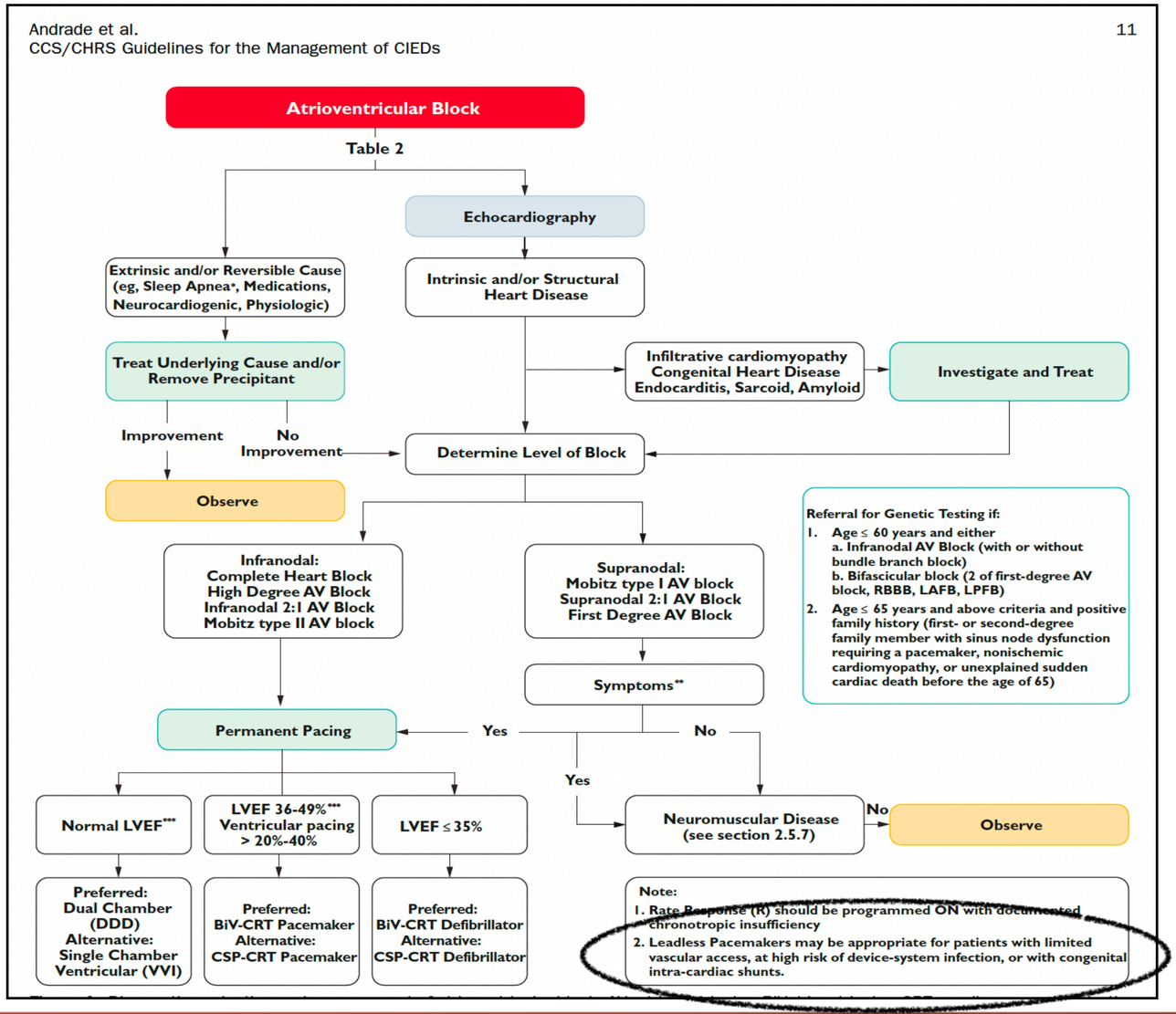
Economic estudies

Study	Country	Year	Population / Comparison	Main Economic Outcome	Key Findings
Real-world Cost-Effectiveness Analysis of Leadless vs. Transvenous Pacemakers	Spain	2025	403 patients (159 leadless vs. 244 transvenous pacemakers)	ICER: €6,263 per life-year gained; €5,211 per QALY gained	Leadless pacemakers demonstrated superior cost-effectiveness and cost-utility, with approximately 90% probability of being cost-effective in sensitivity analyses.
Cost-Effectiveness of Micra VR Leadless Pacemaker	Australia	2024	Micra VR vs. conventional transvenous pacemakers	ICER: AUD 47,379 per QALY gained	Despite higher upfront costs, leadless pacing provided an additional 0.09 QALYs and was considered likely to be cost-effective within the Australian healthcare system.
Real-World Economic Evaluation of Micra VR	France	2026	Propensity-matched comparison of leadless vs. transvenous pacemakers	ICER below commonly accepted European willingness-to-pay thresholds	Leadless pacemakers were associated with fewer major complications and shorter hospital stays, with a 70% probability of being cost-effective at €35,000 per life-year gained.
Health Technology Assessment of Micra TPS	Norway	2018	Leadless vs. conventional transvenous pacemakers	ICER > NOK 1,000,000 per QALY	Cost-effectiveness was highly dependent on baseline infection risk, device longevity, and acquisition costs.

What do Guidelines say?



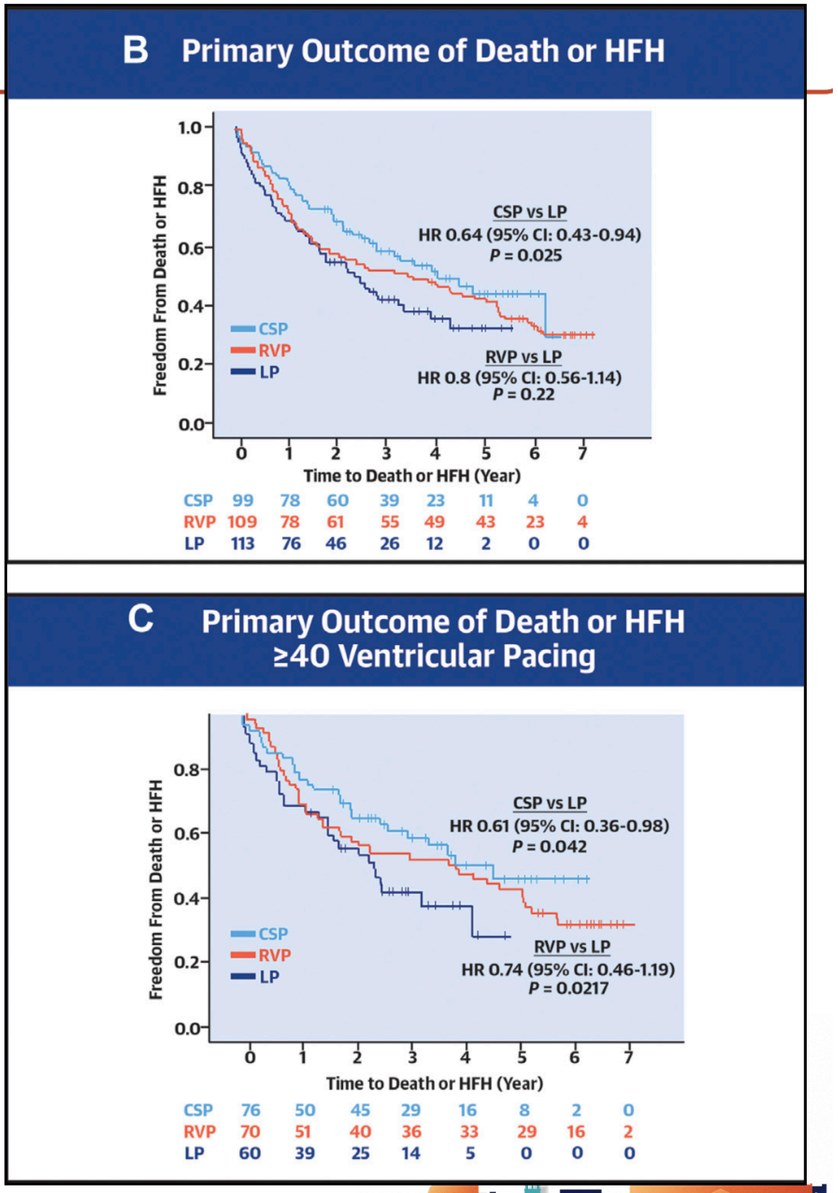
Leadless pacing		
Leadless pacemakers should be considered as an alternative to transvenous pacemakers when no upper extremity venous access exists or when risk of device pocket infection is particularly high, such as previous infection and patients on haemodialysis.	IIa	B
Leadless pacemakers may be considered as an alternative to standard single lead ventricular pacing, taking into consideration life expectancy and using shared decision-making.	IIb	C

LP vs CSP vs RVA

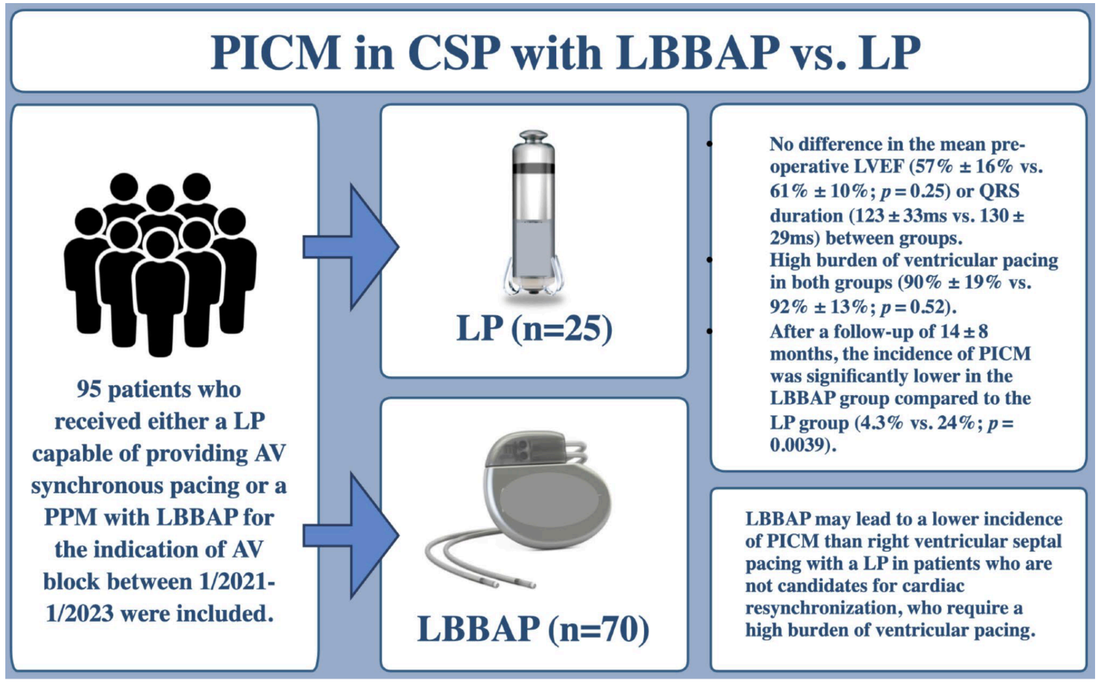
- 555 patients included, single-chamber devices
- LP: 113; RVP: 294; CSP: 148.
- Propensity-score matched
- 7 months follow-up

A Baseline Characteristics	LP (n = 113)	RVP (n = 109)	*P* Value	CSP (n = 99)	*P* Value*
Age (years)	80 ± 12	81 ± 8	0.60	80 ± 9	0.81
Female (n %)	68 (60.2)	74 (65)	0.45	63 (64)	0.61
Diabetes (n %)	52 (46)	43 (39)	0.32	37 (37)	0.20
Hypertension (n %)	105 (93)	94 (86)	0.10	91 (92)	0.78
Obstructive CAD (n %)	37 (32)	43 (39)	0.30	42 (42)	0.15
Revascualrization (n %)	22 (20)	15 (14)	0.25	22 (22)	0.62
Atrial fibrillation (n %)	82 (73)	84 (77)	0.44	81 (82)	0.11
Serum Creatinine mg/dL	1.8 ± 1.7	1.3 ± 0.8	<0.001	1.2 ± 0.5	<0.001
Dialysis (n %)	14 (12)	2 (1.8)	0.44	0	<0.01
Indication for Pacing (n %)			0.62		0.16
AF with Bradycardia	72 (64)	67 (61)		58 (59)	
AV Node Ablation	10(9)	17 (16)		23 (23)	
AV Block	15 (13)	12 (11)		12 (12)	
Sinus Node Dysfunction	16 (14)	13 (12)		6 (6)	
LV Ejection Fraction %	55 ± 12	56 ± 11	0.90	55 ± 11	0.91
Patients LVEF <40%, (n %)	9 (8%)	7 (6%)	0.65	6 (6%)	0.57
Follow-up LVEF (n %)	53 ± 12 (68)	52 ± 11 (73)	0.82	55 ± 11 (64)	0.45
Patients with LVEF <40%, (n %)	10 (15%)	9 (12%)	0.81	4 (6%)	0.21
Baseline QRS, ms	118 ± 32	1,1952 ± 31	0.90	110 ± 27	0.71
LBBB (n %)	7 (6)	9 (8)	0.45	12 (12)	0.34
Paced QRS, ms	160 ± 27	157 ± 27	0.92	125 ± 27	<0.001
Ventricular Pacing %	53 ± 39	64 ± 36	0.02	75 ± 33	<0.001

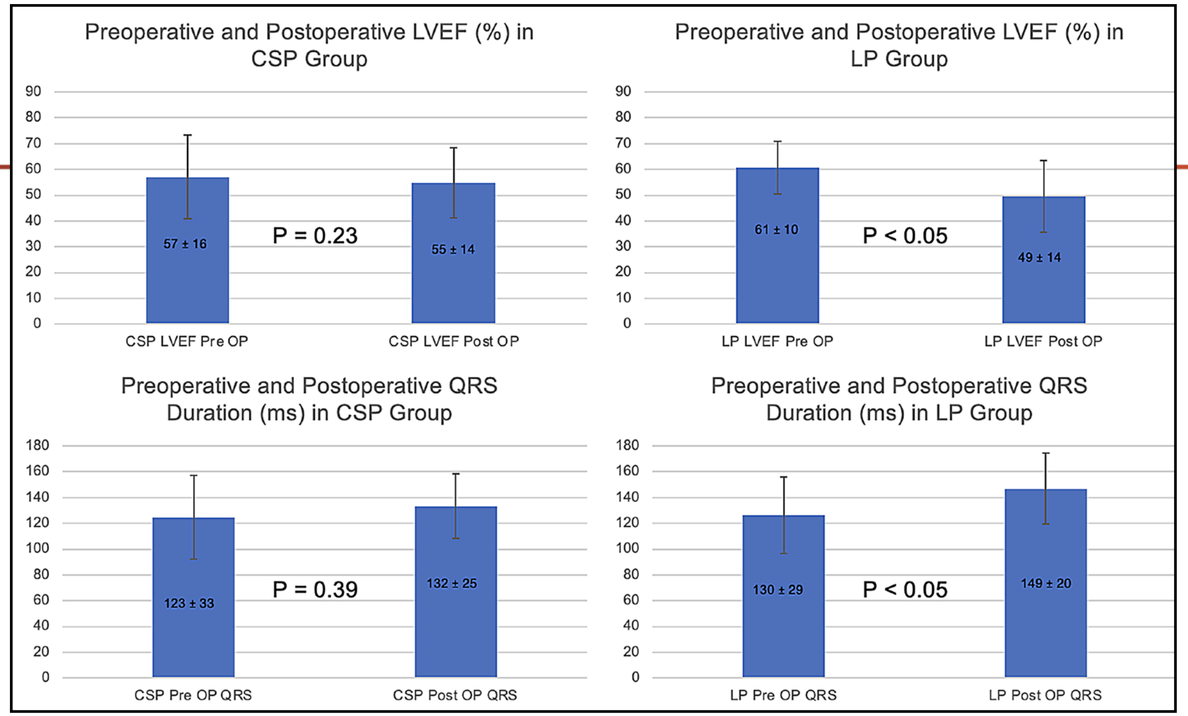
Vijayaraman et al. JACC 2024



LP vs CSP



Chopra M,et al. **Incidence of pacing-induced cardiomyopathy: left bundle branch area pacing versus leadless pacing**. J Interv Card Electrophysiol. 2025

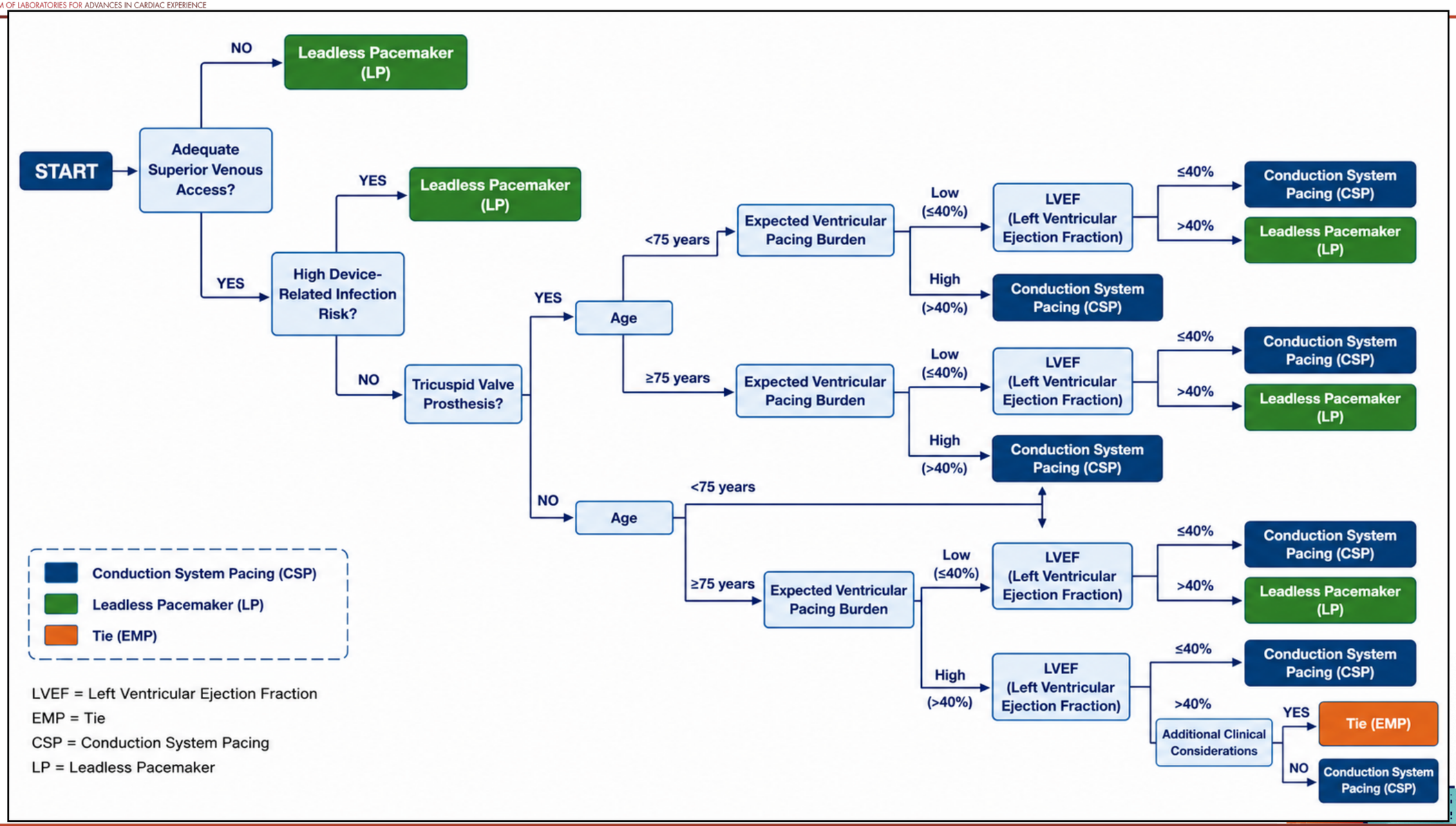


N=95	Conduction System Pacing (70)	Leadless Pacemaker (25)	P value
Follow-up (months)	14 ± 8	13 ± 8	0.87
Ventricular pacing burden (%)	90 ± 19	92 ± 13	0.52
PICM (↓ LVEF by ≥ 20% and LVEF < 50%)	3 (4.3%)	6 (24%)	0.0039
HF related hospitalizations	12 (17.1%)	5 (20%)	0.99

PICM: pacing-induced cardiomyopathy; LVEF: left ventricular ejection fraction

Permanente A Fib

Andalusian experts consensus



LVEF = Left Ventricular Ejection Fraction
EMP = Tie
CSP = Conduction System Pacing
LP = Leadless Pacemaker

Ultimate solution?

LEAP2: A first-in-human evaluation of a chronically implanted novel leadless pacemaker for conduction system pacing

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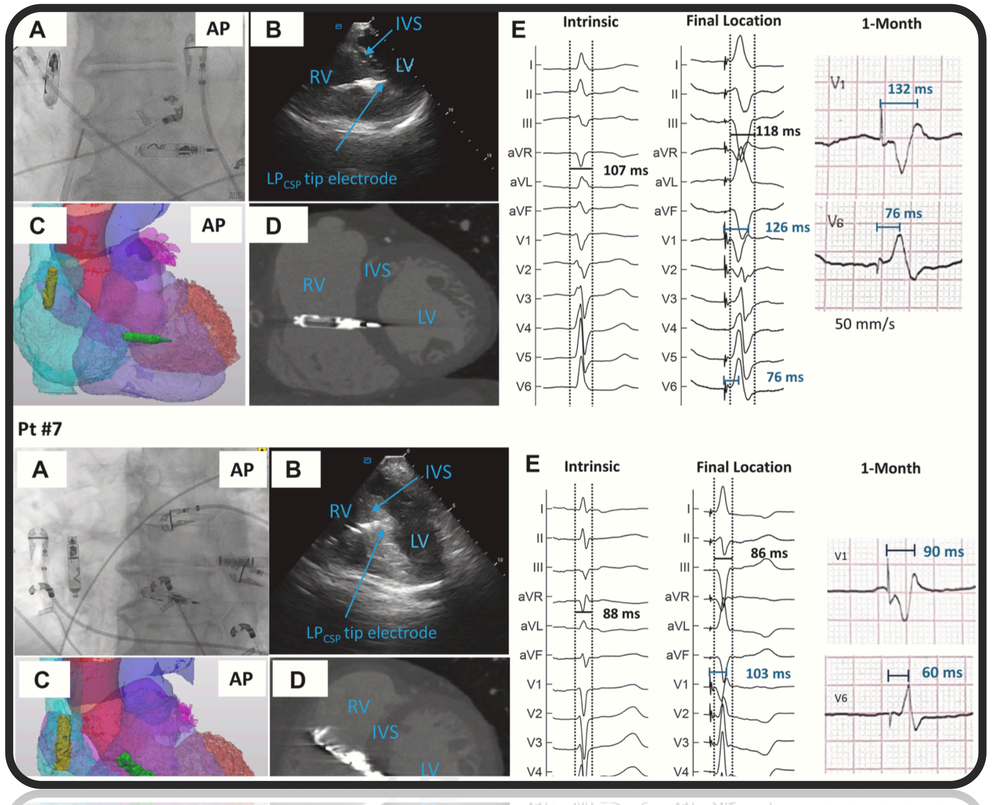

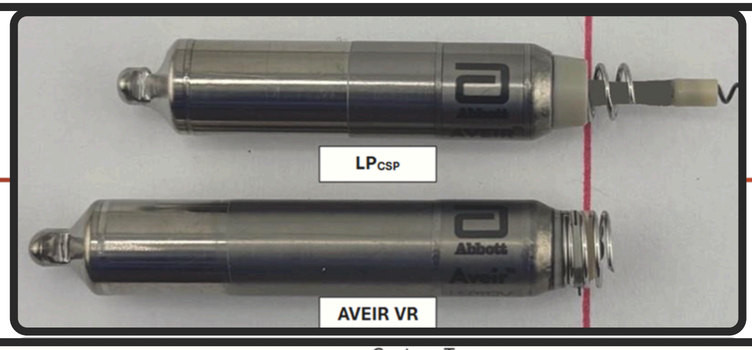

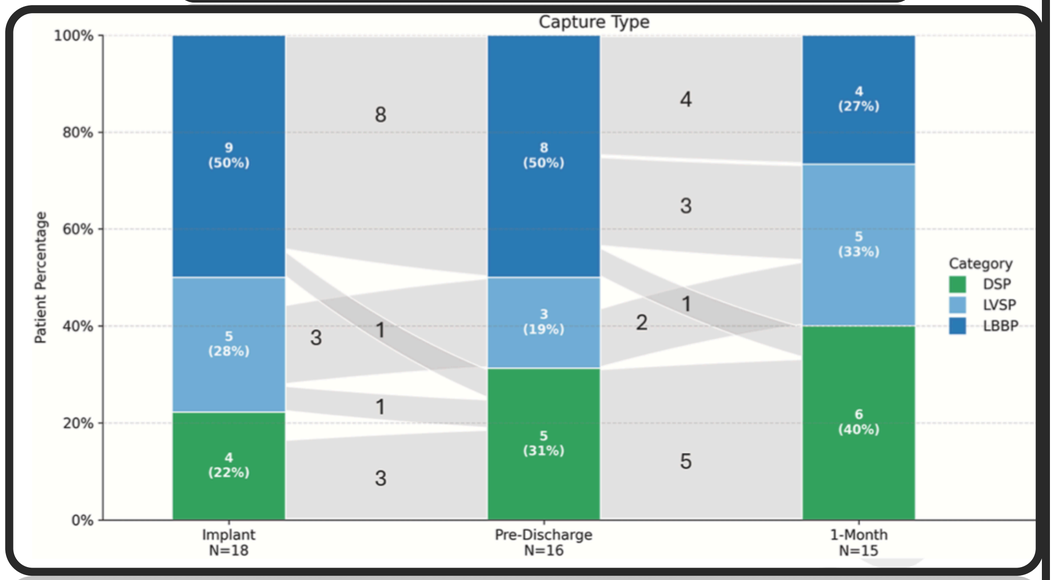

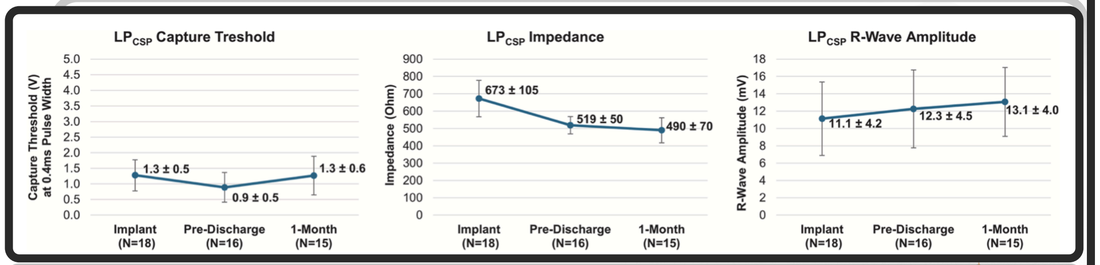

Heart Rhythm 2026

Conclusions

- Lack of consistent evidence comparing CSP and LP so far
- Individualize acording the need of the patient
- CSP: Preventing PICM, ¿prognosis?; LP: Preventing infection and lead-related complication
- Looking forward to the “ultimate solution”

Thank you for your attention