



The 5th Indonesian
Symposium on Heart Failure and
Cardiometabolic Disease

Getting to Know Conduction-System-Pacing in Heart Failure Management

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Indonesian Working Group
on Heart Failure
and Cardiometabolic Disease



Jumat, 13 Juni 2025
14.50-15.10 WIB



2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

IHEFCARD 2025
2021

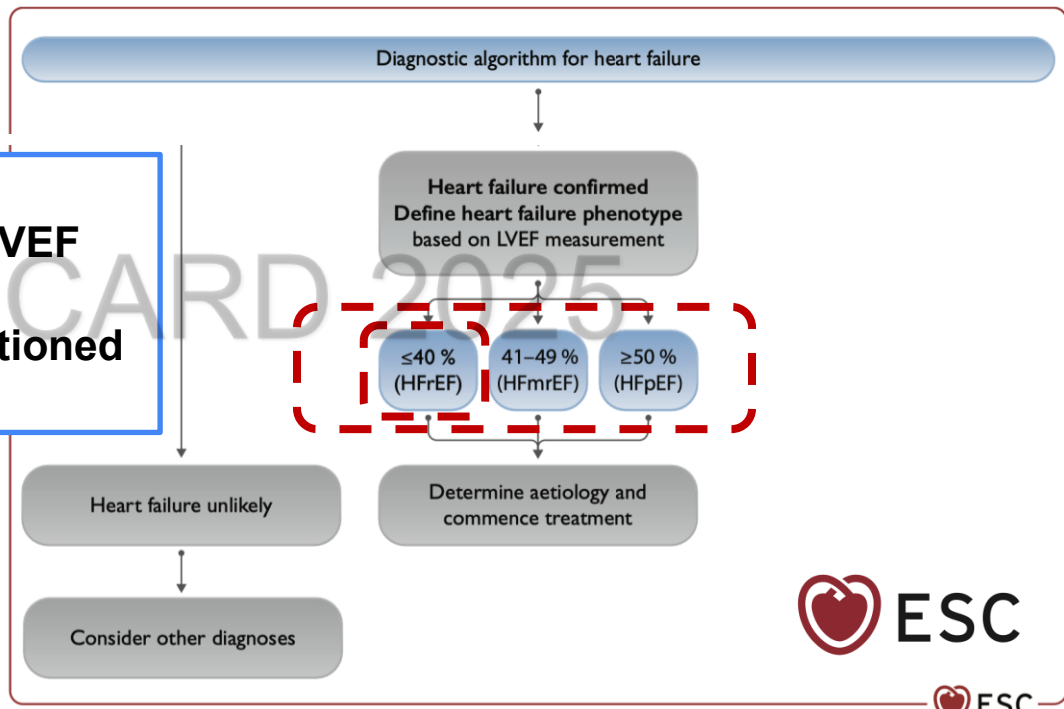
2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

ESC:

HF was phenotyped based on LVEF

**Moreover device therapy was mentioned
in HFrEF management**



Management of HFrEF

To reduce mortality - for all patients

ACE-I/ARNI

BB

MRA

SGLT2i

To reduce HF hospitalization/mortality - for selected patients

Volume overload

Diuretics

SR with LBBB ≥ 150 ms

CRT-P/D

SR with LBBB 130–149 ms or non LBBB ≥ 150 ms

CRT-P/D

Ischaemic aetiology

ICD

Non-ischaemic aetiology

ICD

Atrial fibrillation

Anticoagulation

Atrial fibrillation

Digoxin

Coronary artery disease

SA/AVN

Iron deficiency

ESAs

Aortic stenosis

SAVR/TAVI

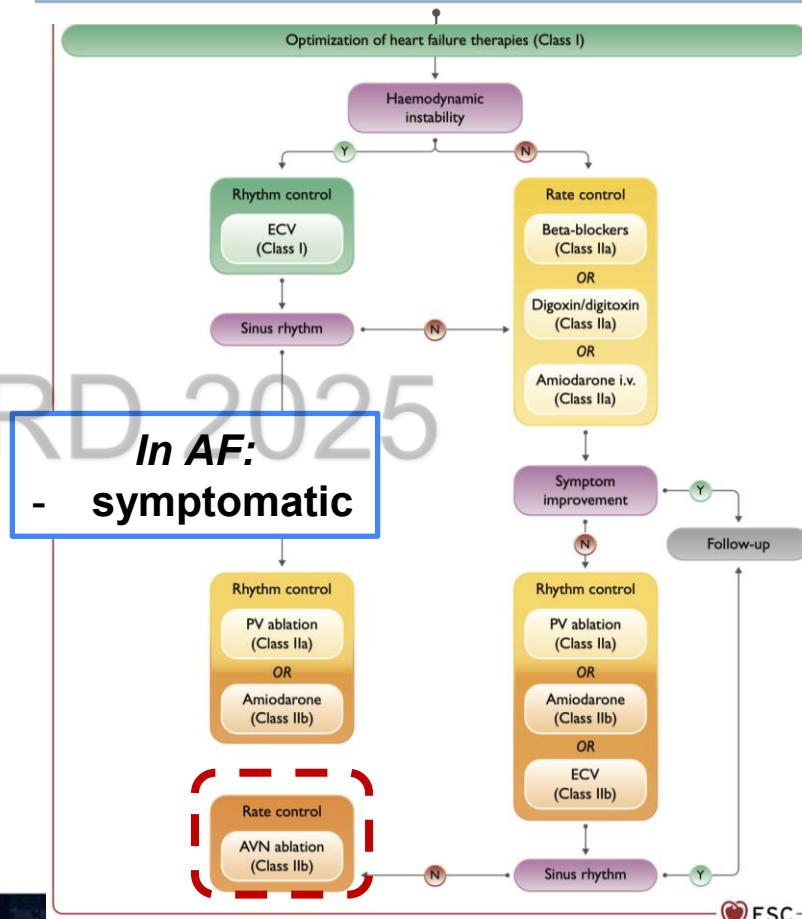
Mitral regurgitation

TEE MV Repair

In sinus rhythm:

- LBBB
- QRS duration
- Ischaemic etiology

Management of atrial fibrillation in patients with HFrEF



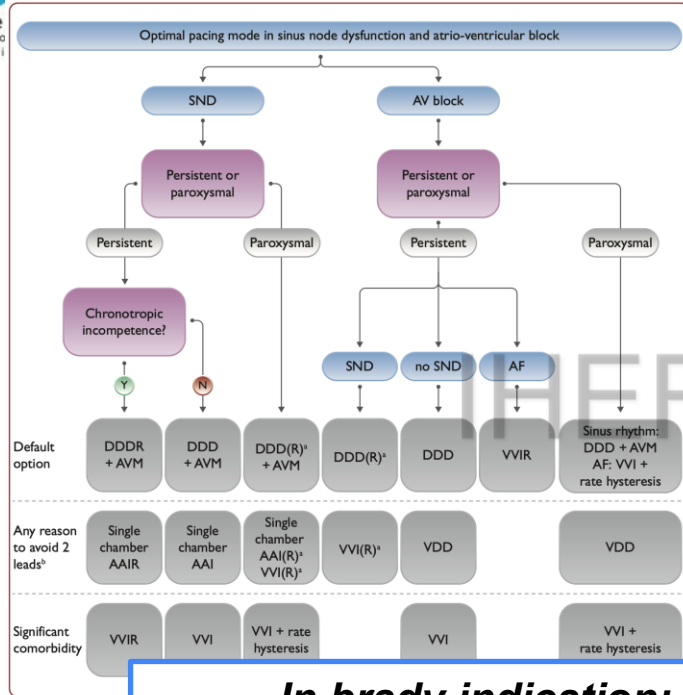
2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

Selected Indications:

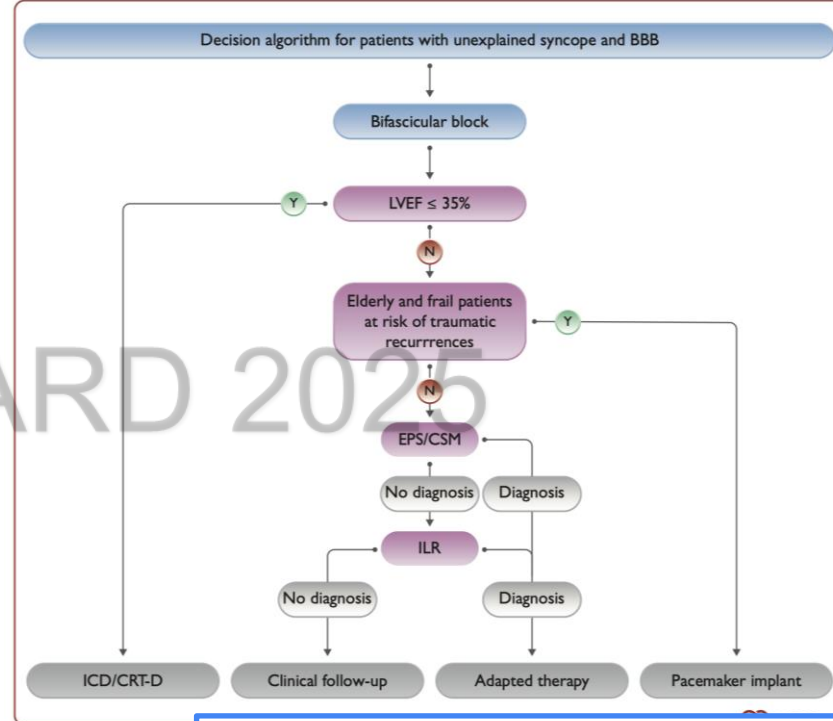
- Bradycardia and Conduction System Disease
 - Sinus node dysfunction
 - Atrioventricular block
 - Bundle branch block
- Cardiac Resynchronization
 - CRT in sinus
 - CRT in AF
 - Pacing with reduced ejection fraction
 - Upgrade to CRT
 - Adding ICD to CRT

CRT indication:

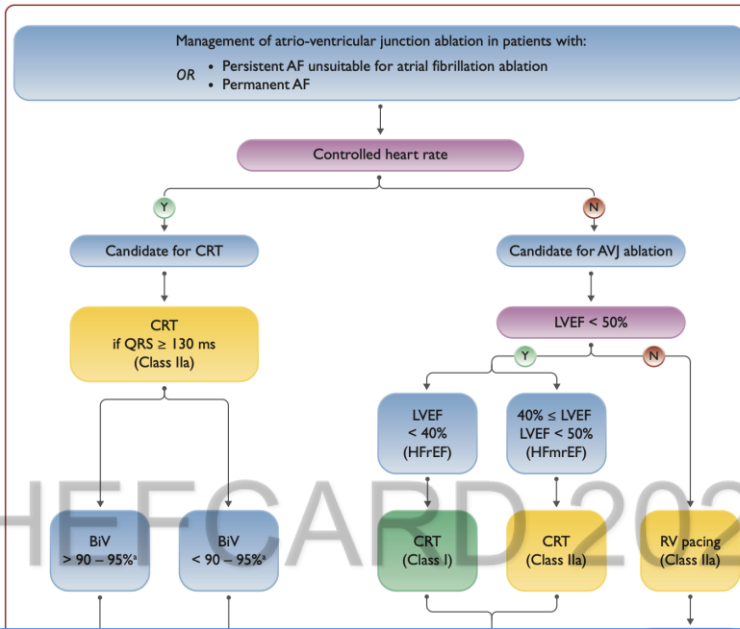
- Wide QRS / LBBB
- Anticipated high pacing burden (> 20 / 30 / 40%)



In brady indication:
HF was not specifically mentioned

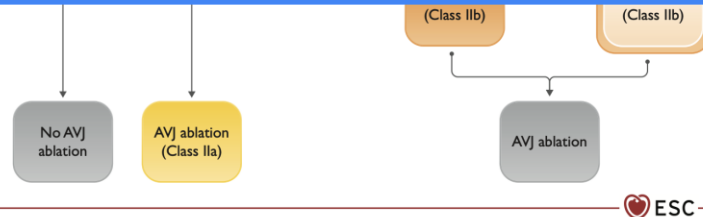


In BBB indication:
Low EF is indicator for defibrillator

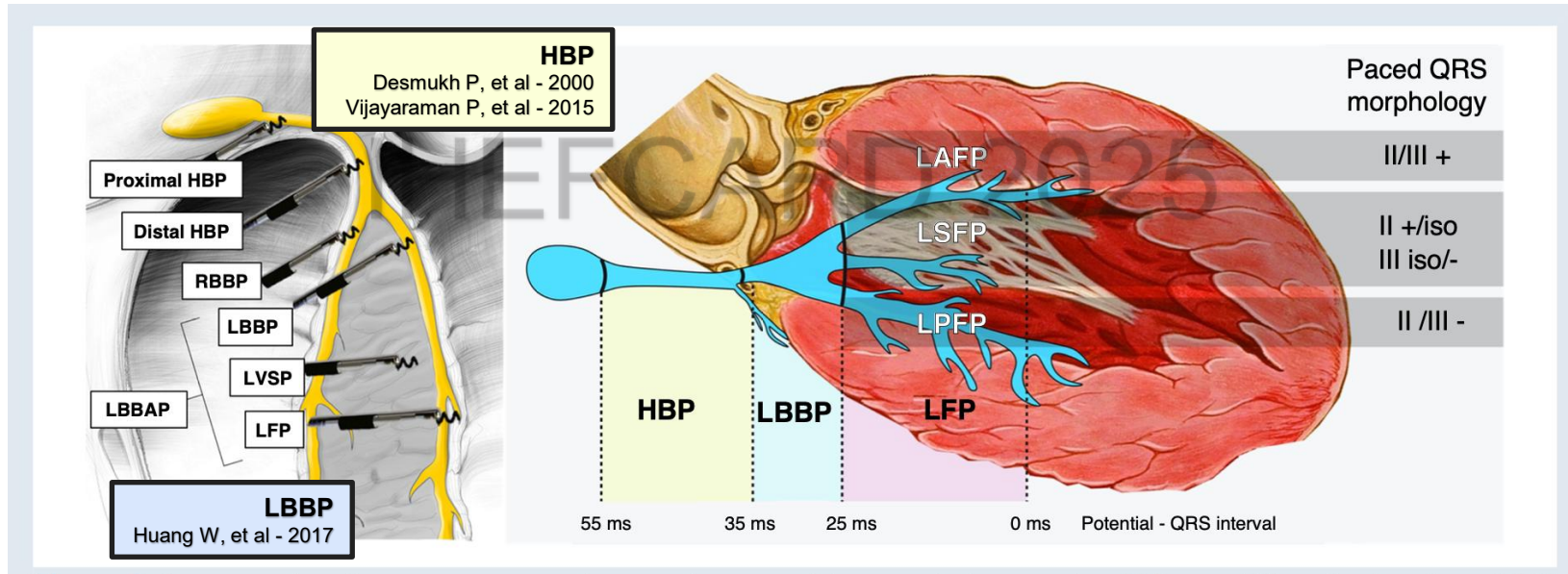


AV-junctioned ablation for AF:

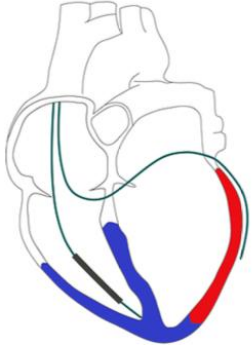
- CRT is the primary option
- CRT / HBP has a stronger recommendation in reduced LVEF population



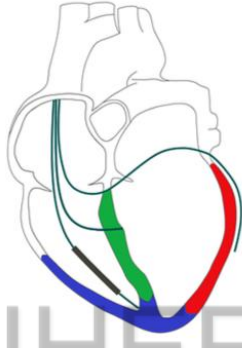
What is Conduction-System Pacing?



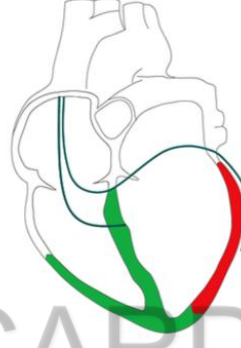
BiV-CRT
(RVP + CS)



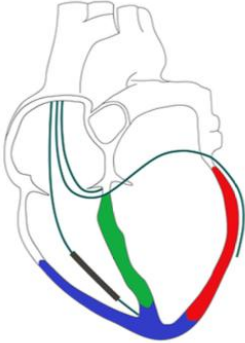
LOT-CRT
(LBBAP + BiVP)



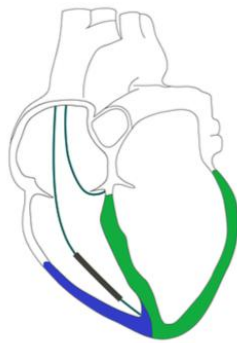
LOT-CRT
(LBBAP + CS)



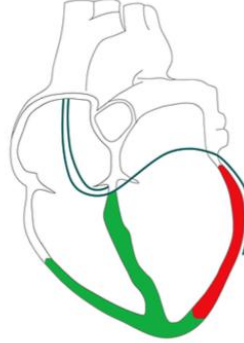
HOT-CRT
(HBP + BiVP)



HOT-CRT
(HBP + RVP in RBBB)



HOT-CRT
(HBP + CS)

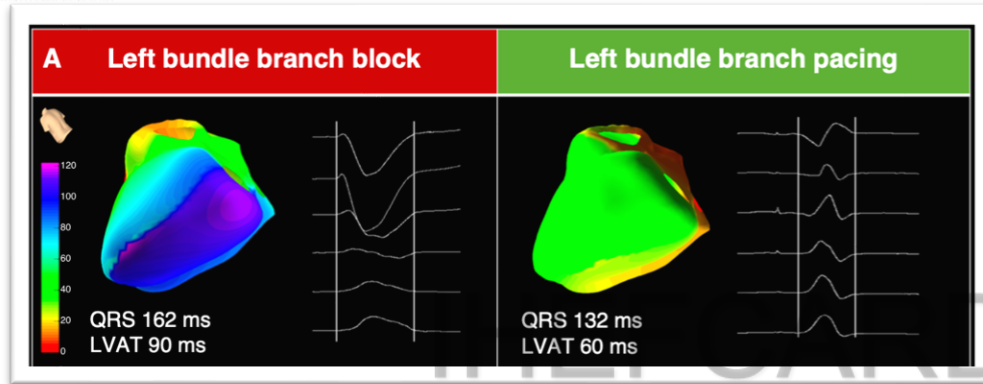


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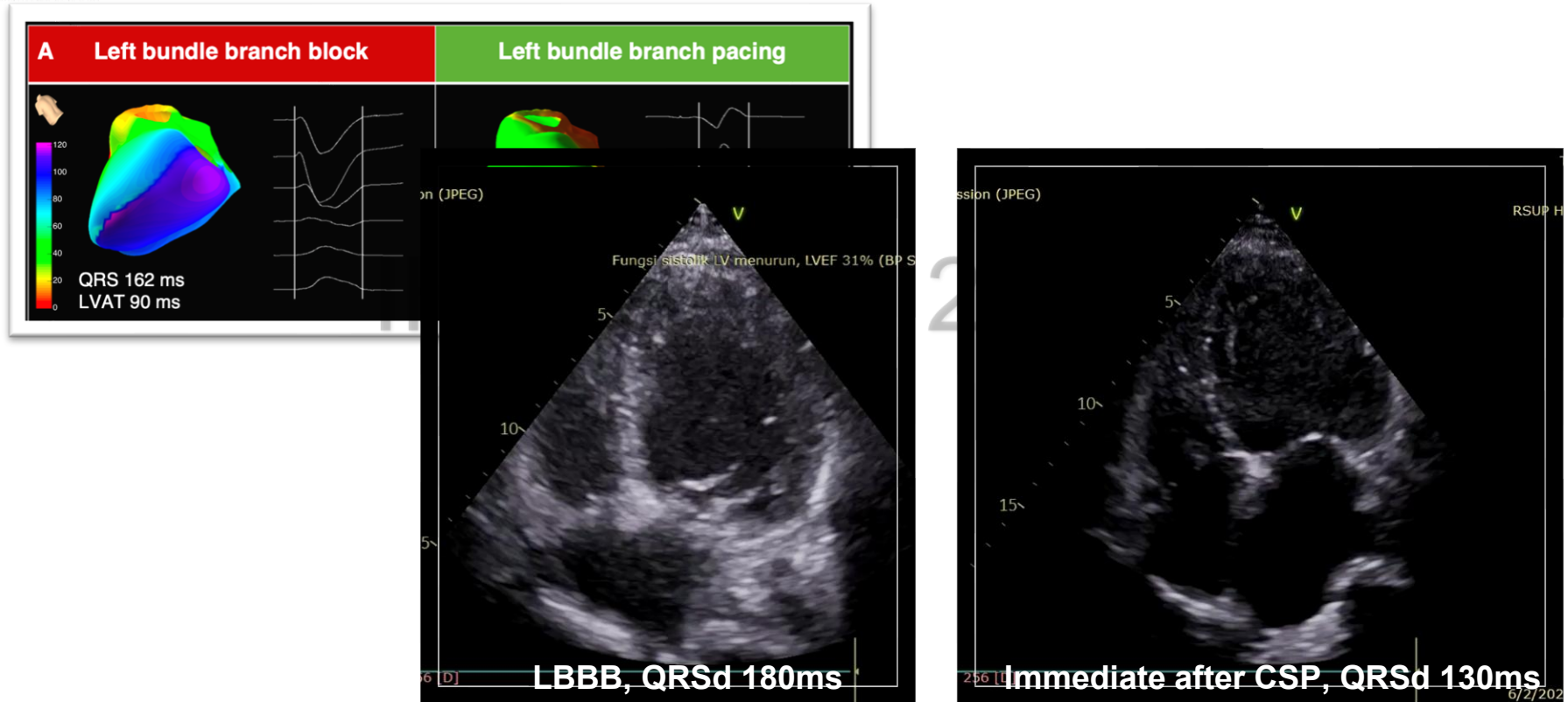
B

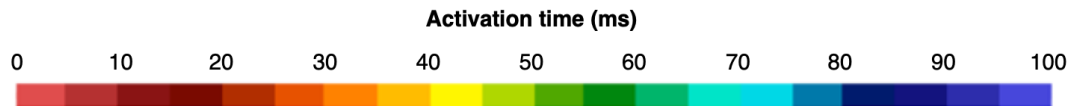


The value of Conduction-System Pacing?



The value of Conduction-System Pacing?





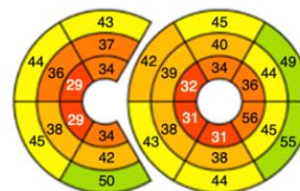
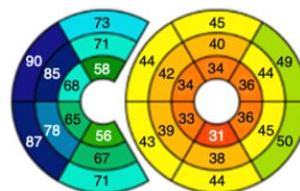
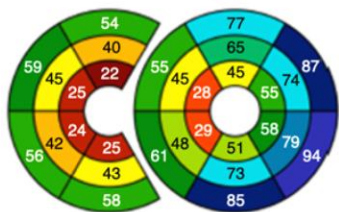
RVAP

BiVP

LVSP

Physiological!

sHBP



Does this translate into clinical benefit for HF patients?

Outcomes of conduction system pacing for cardiac resynchronization therapy in patients with heart failure: A multicenter experience ^e

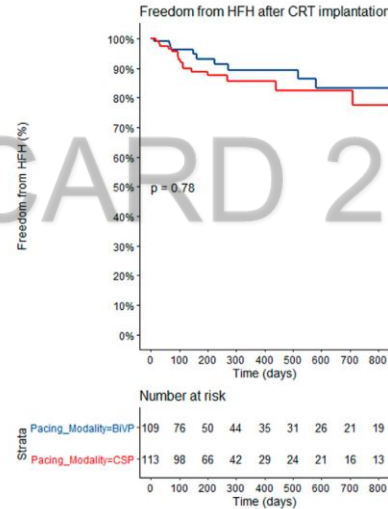
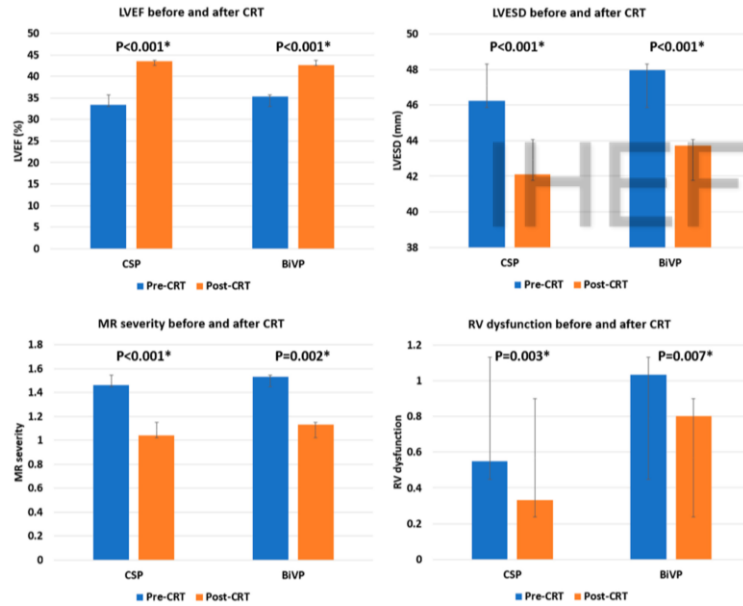


Figure 4 Kaplan-Meier curves demonstrating comparison of time to first heart failure hospitalization (HFH) between patients with CSP and BiVP. Abbreviations as in Figure 1.

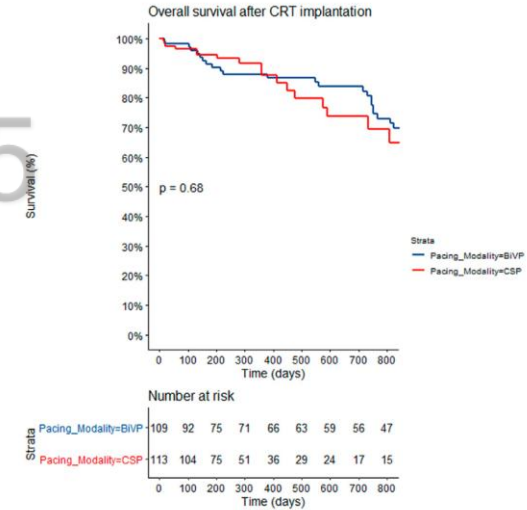


Figure 5 Kaplan-Meier curves demonstrating survival comparison between patients with CSP and BiVP. Abbreviations as in Figure 1.

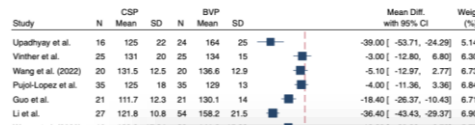
Improved outcomes of conduction system pacing in heart failure with reduced ejection fraction: A systematic review and meta-analysis



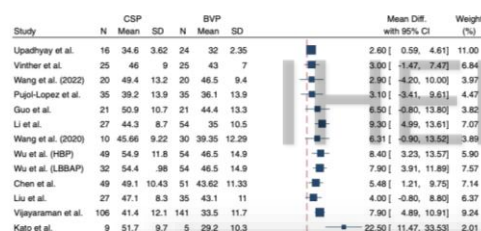
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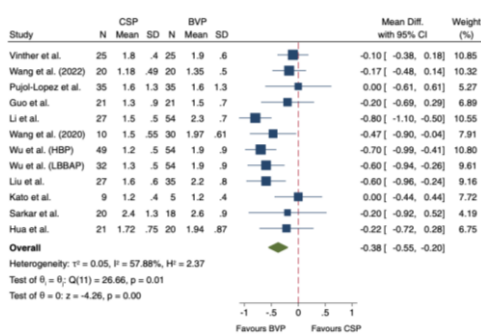
A QRS Duration



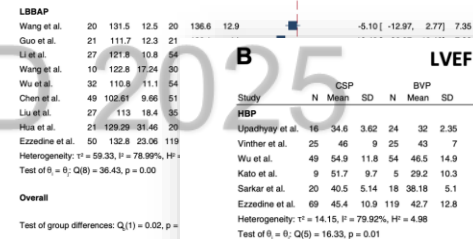
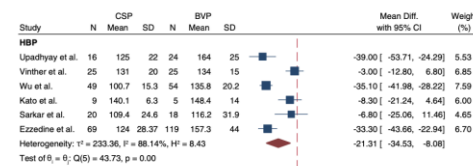
B LVEF



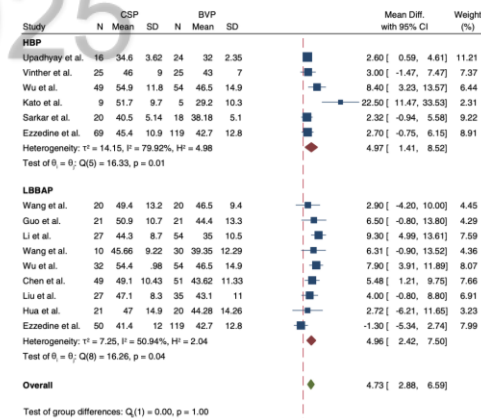
C NYHA



A QRS Duration



B LVEF

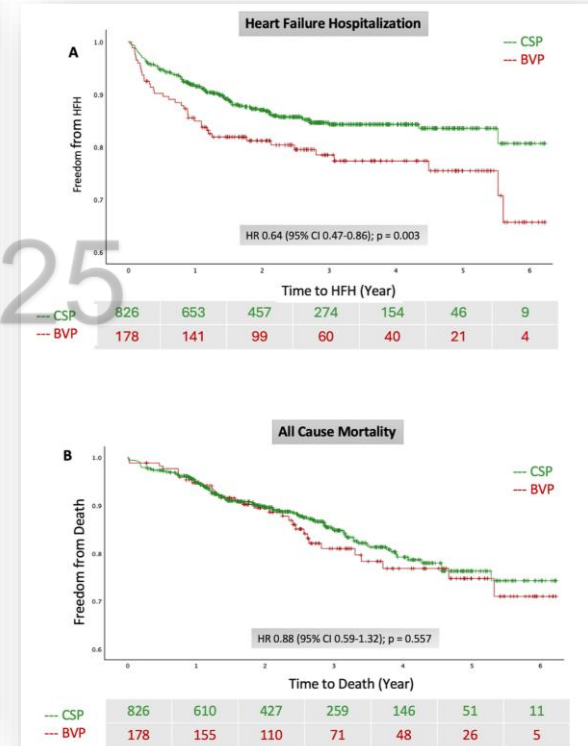
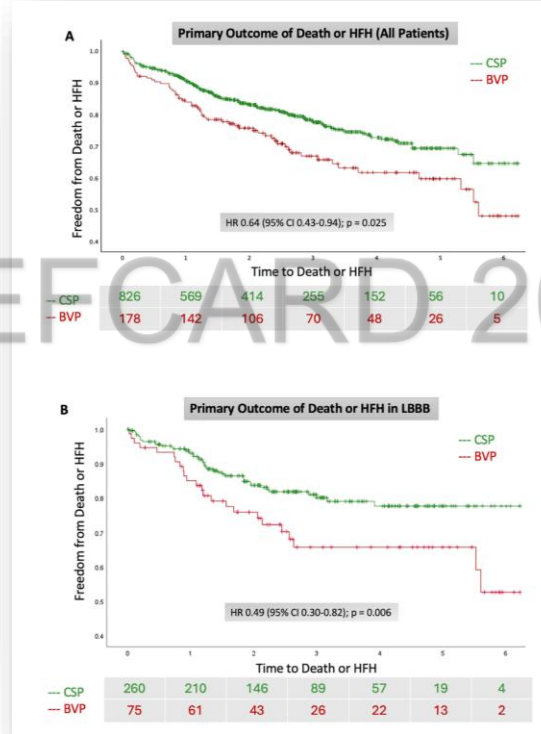
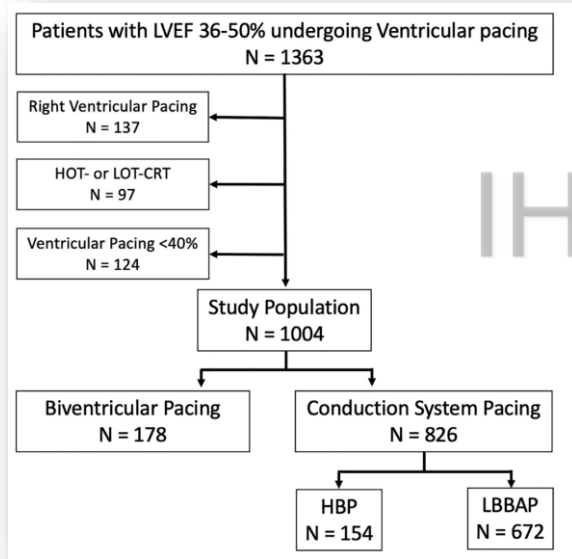


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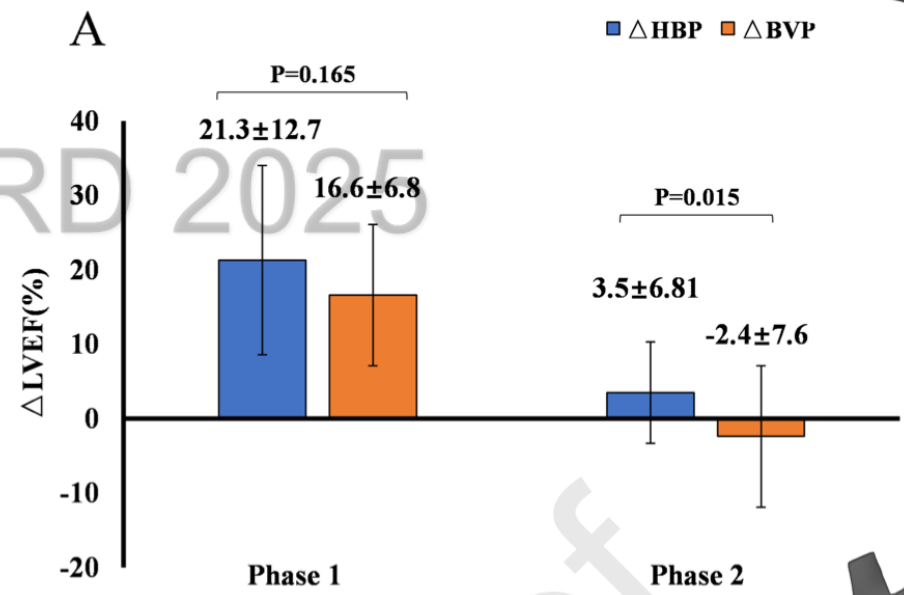
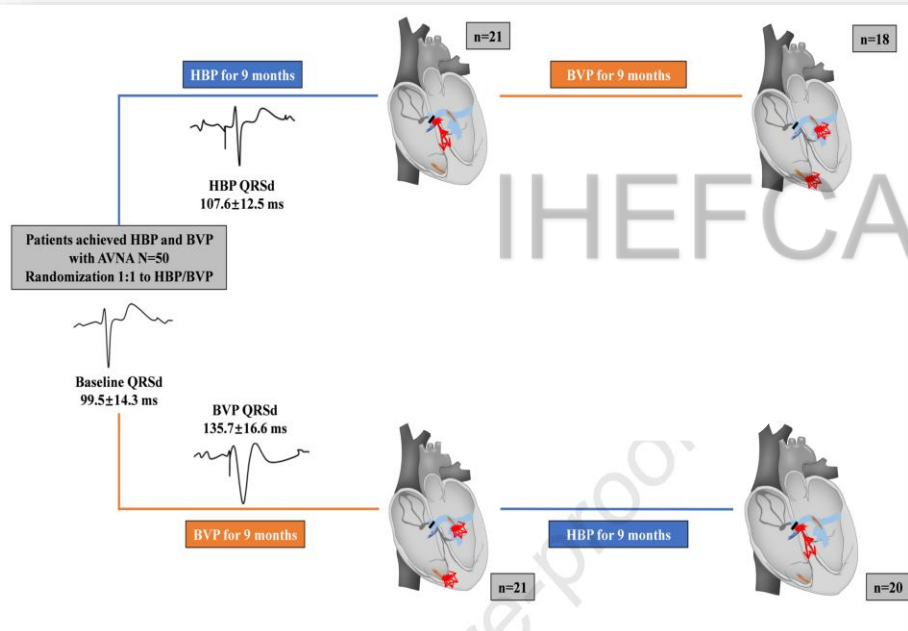


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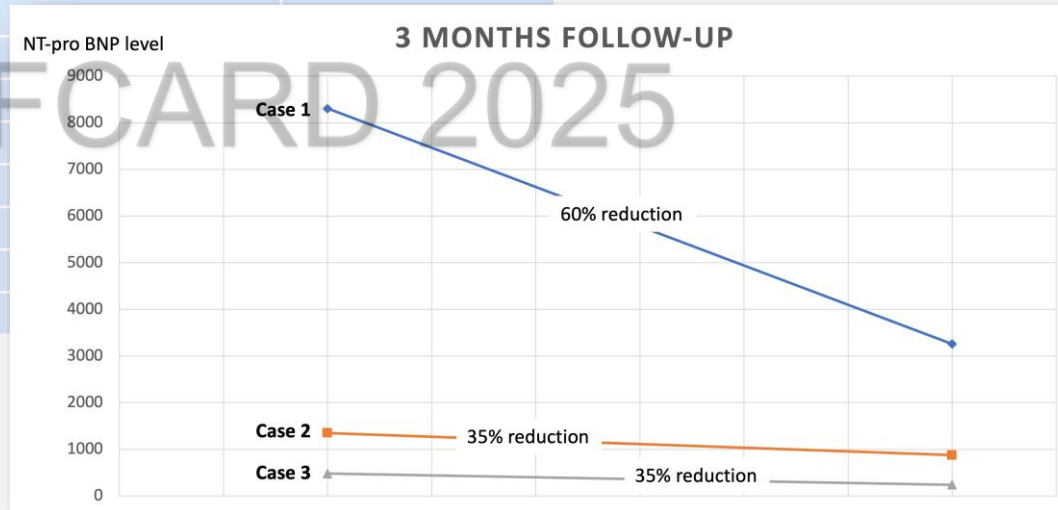
Conduction system pacing compared with biventricular pacing for cardiac resynchronization therapy in patients with heart failure and mildly reduced left ventricular ejection fraction: Results from International Collaborative LBBAP Study (I-CLAS) Group



His Bundle Pacing vs Biventricular Pacing Following Atrioventricular Node Ablation in Patients with Atrial Fibrillation and Reduced Ejection Fraction: A Multicenter, Randomized, Crossover Study. The ALTERNATIVE-AF trial.



	Case 1	Case 2	Case 3
Sex	M	M	F
Age, years	71	57	78
Hypertension	N	Y	N
Diabetes	N	N	Y
Ischemic heart disease	Y		
Previous stroke	Y		
eGFR	44		
NYHA	III		
LVEF, %	38		
NT-pro BNP, pg/mL	8.305		
AF type	Permanent		
CHA2DS2-VASc score	5		



Atrioventricular block

Heart failure

	LVEF <40% HFref	LVEF 40–49% HFmrEF	LVEF ≥50% HFpEF
CSP	ABACUS. CSP+AVNA vs. AF ablation <i>n</i> = 220		
	CSP-SYNC. CSP vs. BIVP <i>n</i> = 62		
	NCT06342492. CSP vs. surgical epicardial LV lead <i>n</i> = 100		
	HIS-alt_2. CSP vs. BIVP <i>n</i> = 125		
	HIS alternative II. CSP vs. BIVP <i>n</i> = 40		
	CONSYST-CRT. CSP vs. BIV CRT <i>n</i> = 130		
	PhysioSync-HF. CSP vs. BIVP <i>n</i> = 304		
	CONSYST-CRT II. CSP vs. BIV CRT <i>n</i> = 320		
	CSP vs. BIV CRT <i>n</i> = 2136		
	CSP-UPGRADE. CSP vs. BIVP <i>n</i> = 66		
LBBAP	CONDUCT-AF. CSP+AVNA vs. BIVP+AVNA <i>n</i> = 82		
	HIS-CRT. CSP vs. BIVP <i>n</i> = 120		
	LIT-HF. CSP vs. OMT <i>n</i> = 120		
	PACE-FIB. CSP+AVNA vs. OMT <i>n</i> = 334		
	RAFT-Preserved. CSP vs. BIVP vs. OMT <i>n</i> = 370		
	EARLY-RESYNC. LBBP vs. OMT <i>n</i> = 60		
	LBBP Noninferior CRT. LBBP vs. BIVP <i>n</i> = 160		
	LEFT-BUNDLE-CRT Trial. LBBAP vs. BIVP <i>n</i> = 176		
	LBBAP-AFHF. LBBAP vs. BIVP <i>n</i> = 60		
	RAFT-P&A. CSP+AVNA vs. OMT <i>n</i> = 600		
LOT-CRT	LeCaRT. LBBAP vs. CRT <i>n</i> = 170		
	RECOVER-HF. LBBP vs. BIVP <i>n</i> = 60		
LOT-CRT	BATTLE. LOT-CRT vs. BIVP, <i>n</i> = 86		
	RESCUE. LOT-CRT vs. LBBAP vs. BIVP <i>n</i> = 30		

Heart failure

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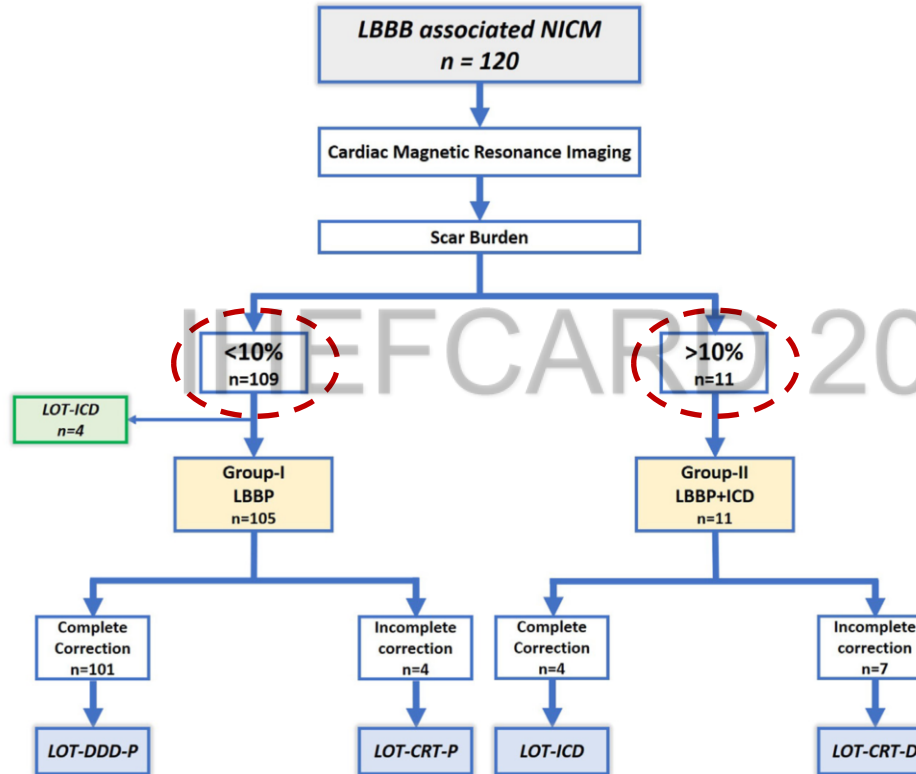
LVEF <40% HFref	LVEF 40–49% HFmrEF	LVEF ≥50% HFpEF
ABACUS. CSP+AVNA vs. AF ablation <i>n</i> = 220		
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LeCaRT. LBBAP vs. CRT <i>n</i> = 170		
RECOVER-HF. LBBP vs. BIVP <i>n</i> = 60		
BATTLE. LOT-CRT vs. BIVP, <i>n</i> = 86		
RESCUE. LOT-CRT vs. LBBAP vs. BIVP <i>n</i> = 30		

Light grey: soft endpoints

Dark grey: hard endpoints

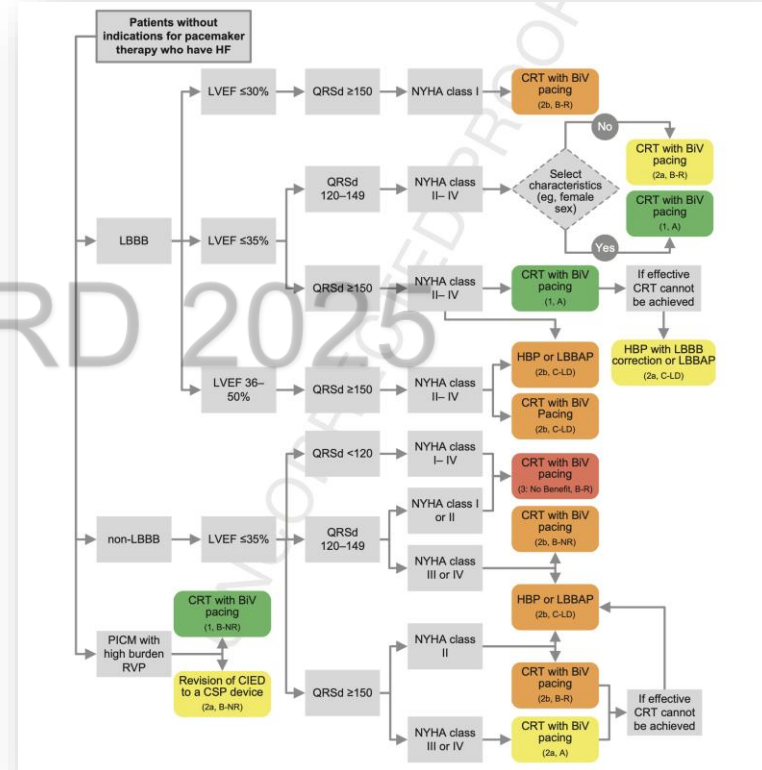
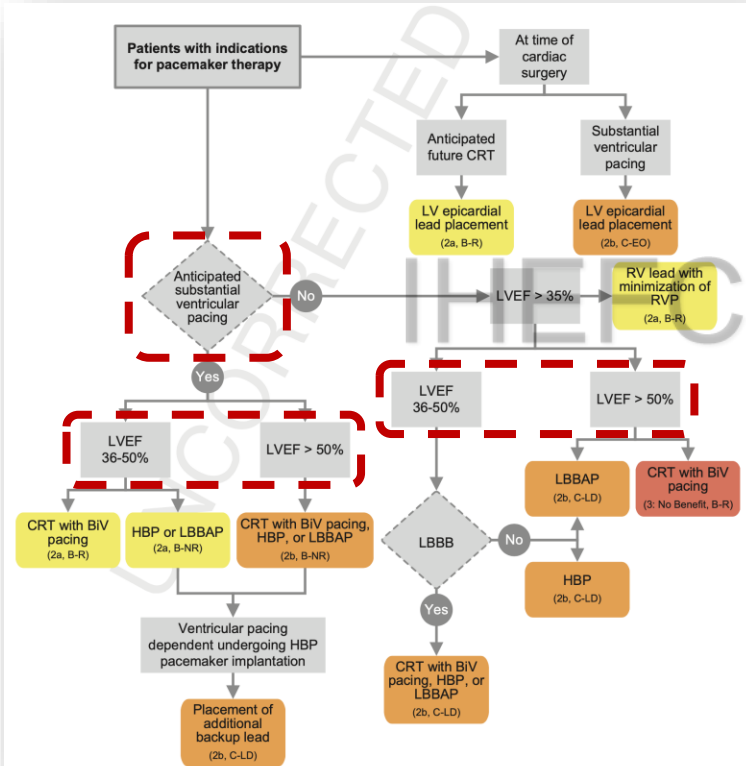
Medium gray: soft and hard endpoints combination

Which CSP?

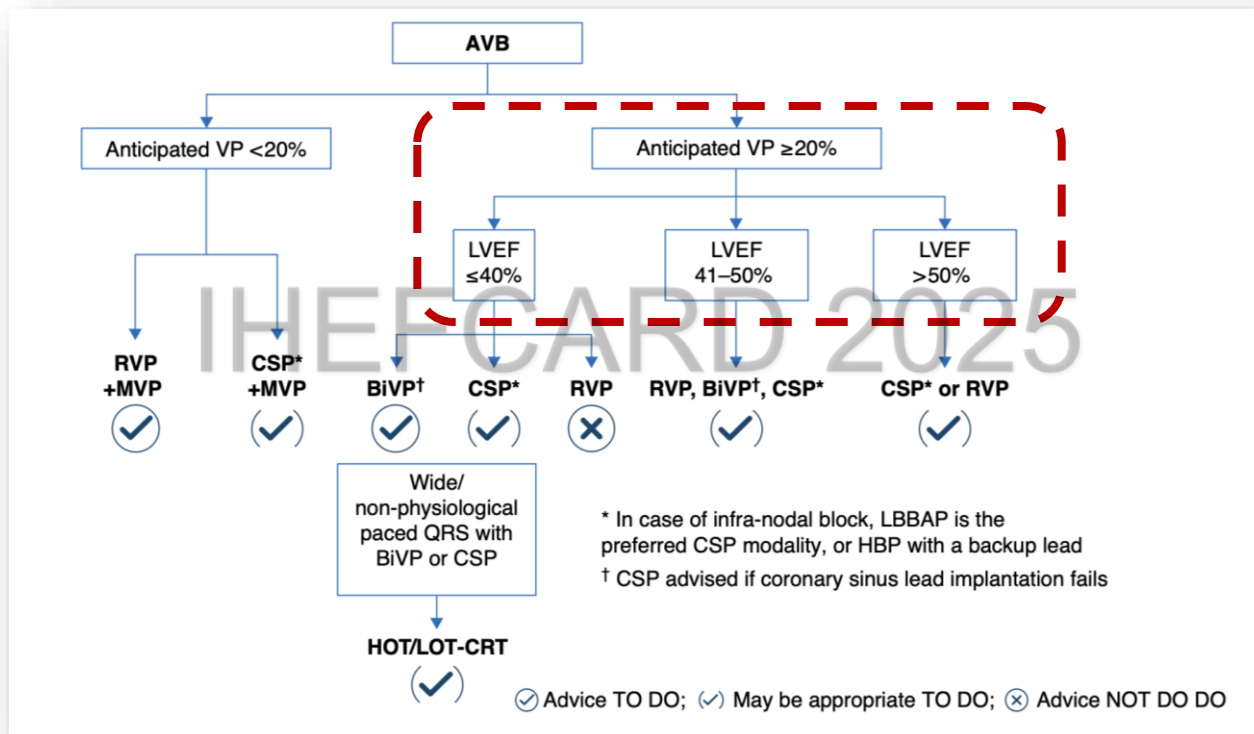


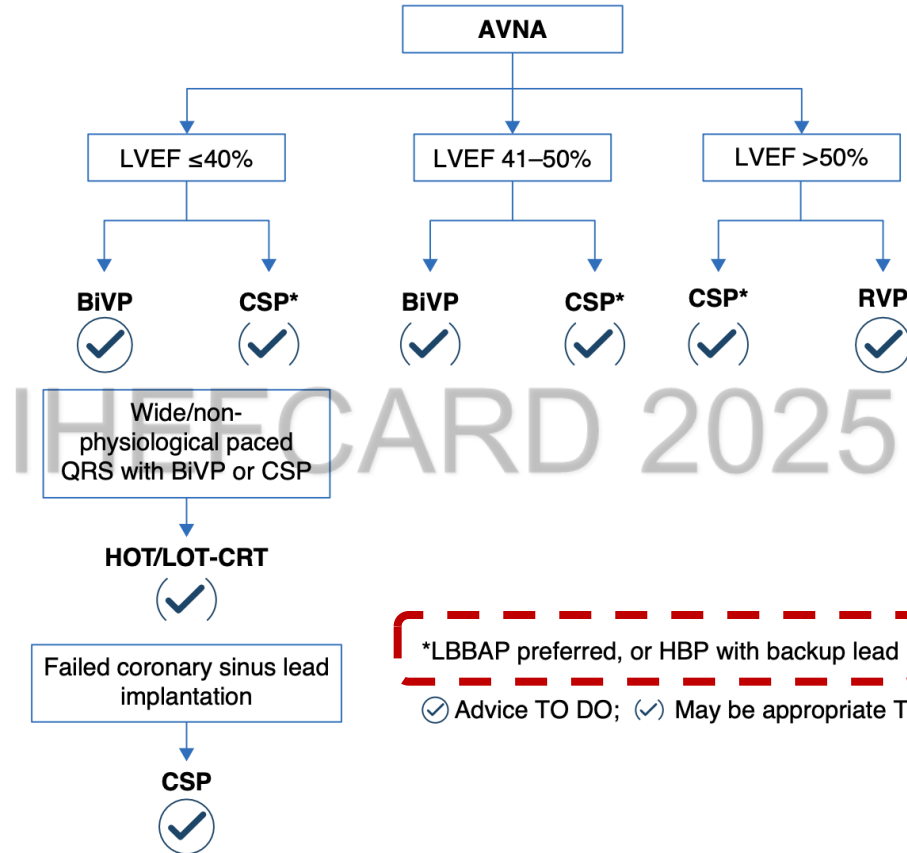
Madurai LBBP study

2023 HRS/APHS/LAHS guideline on cardiac physiologic pacing for the avoidance and mitigation of heart failure



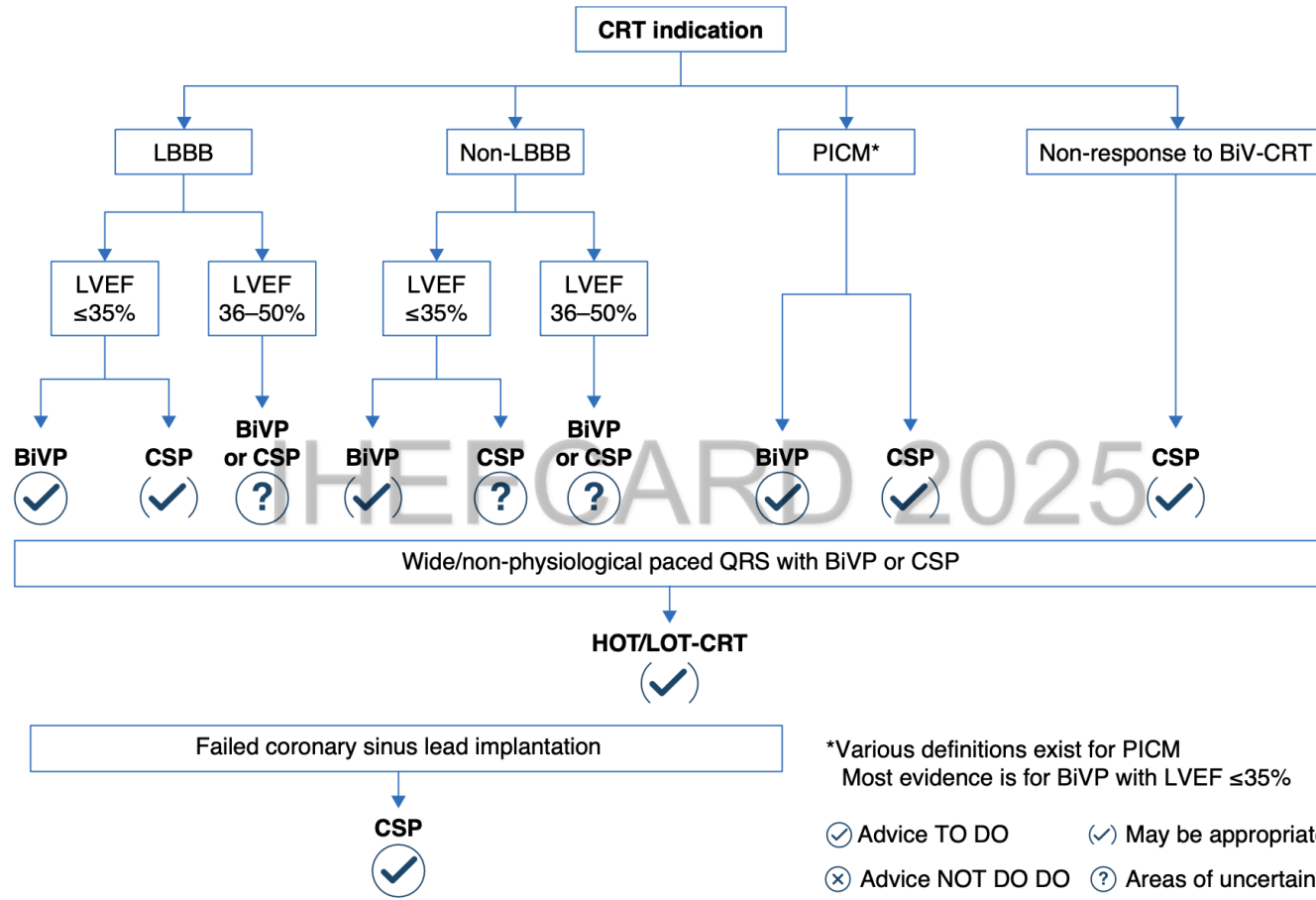
ESC Clinical Consensus for CSP indications - 2025





*LBBAP preferred, or HBP with backup lead

✓ Advice TO DO; ✓ May be appropriate TO DO





Editorial Commentary

Check for updates

Conduction system pacing as cardiac resynchronization therapy in patients with heart failure with reduced ejection fraction: More optimism than caution!

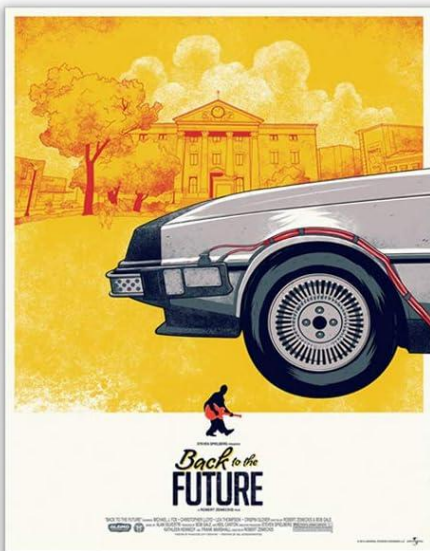
Pranav Mankad, MD, Kenneth A. Ellenbogen, MD

See related articles on page 874 and 881

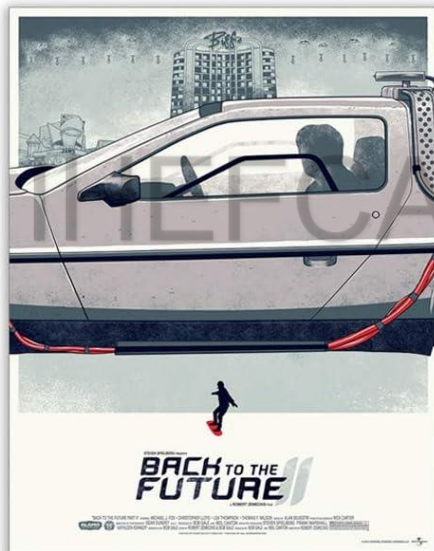
(Heart Rhythm 2024;21:890–892) © 2024 Heart Rhythm Society. All rights reserved.

- Conduction system pacing (CSP) bring us back to the future
Technology was found in early 2000, but not until recently utilized effectively
- Not a CRT replacement, it enhanced resynchronization
- (Cheaper option than conventional CRT!)
- Provides physiological electrical activities that translate into clinical HF benefits
(LV function, LV dimension, MR, RV function, mortality, HFH)
- HRS / APHRS / LAHRS and EHRA recently accommodated wider pacing indications for HF patients using CSP
- Upcoming Heart Failure guidelines, undeniable?

Thank you



2021



2025



future

