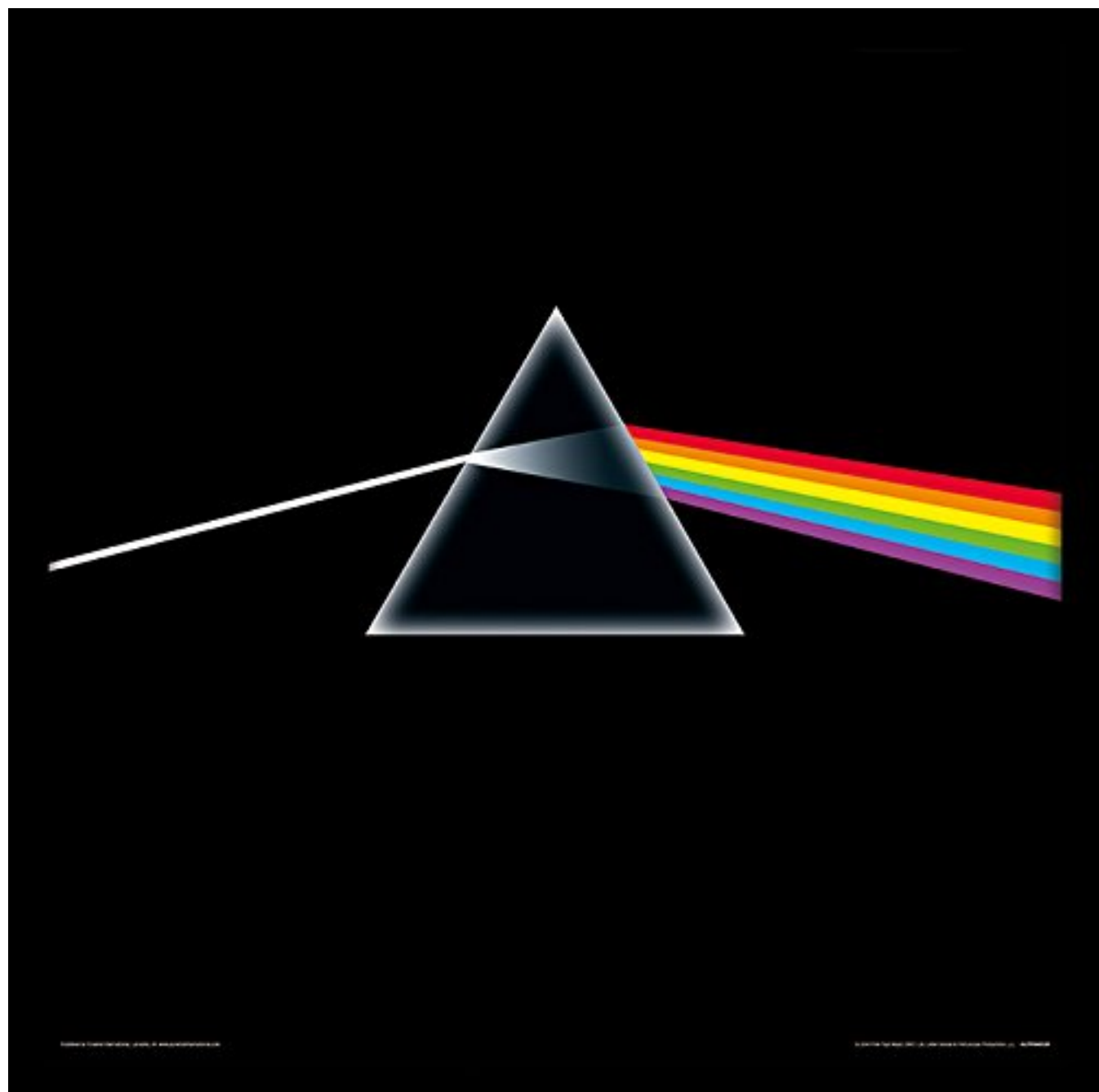




PACING DEL SETTO PROFONDO COME PRIMA SCELTA NEI PAZIENTI CON BLOCCO AV

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ESC

European Society
of Cardiology

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EDITORIAL

How harmful is right ventricular pacing?

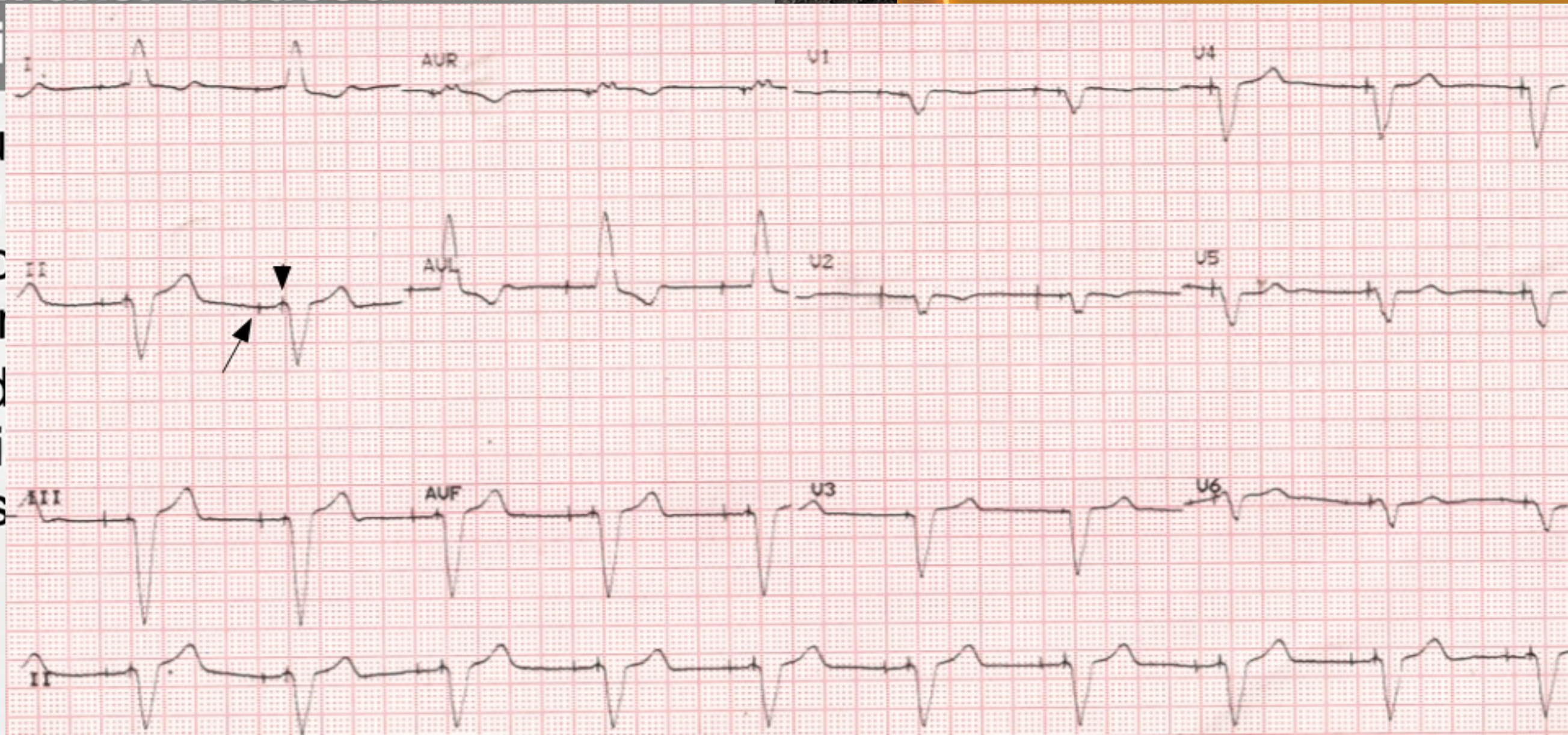




L'Imbuto della Cardiomiopatia

Pacemaker-Induced Cardiomyopathy

- Riduzione della funzione cardiaca (con espansione del ventricolo sinistro)
- Incidenza variabile, dipende dall'età e dalla durata dell'uso del pacemaker



(Scompenso Cardiaco)

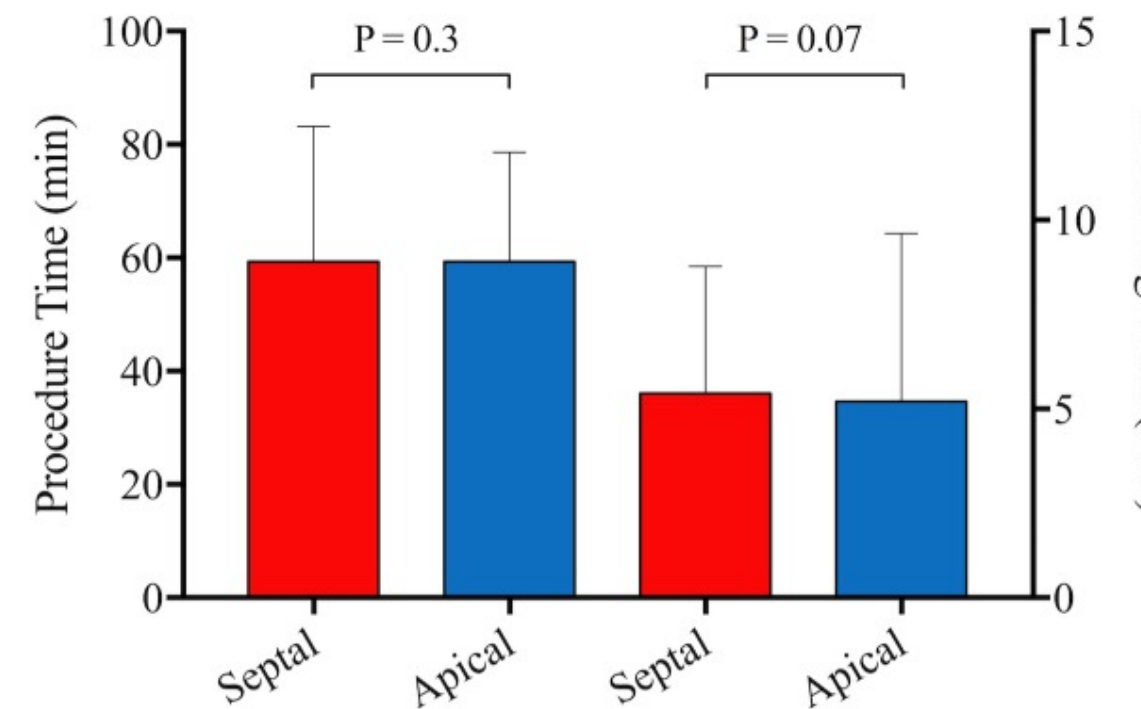
- **Semplicità d'impianto**

9.7 Lead position

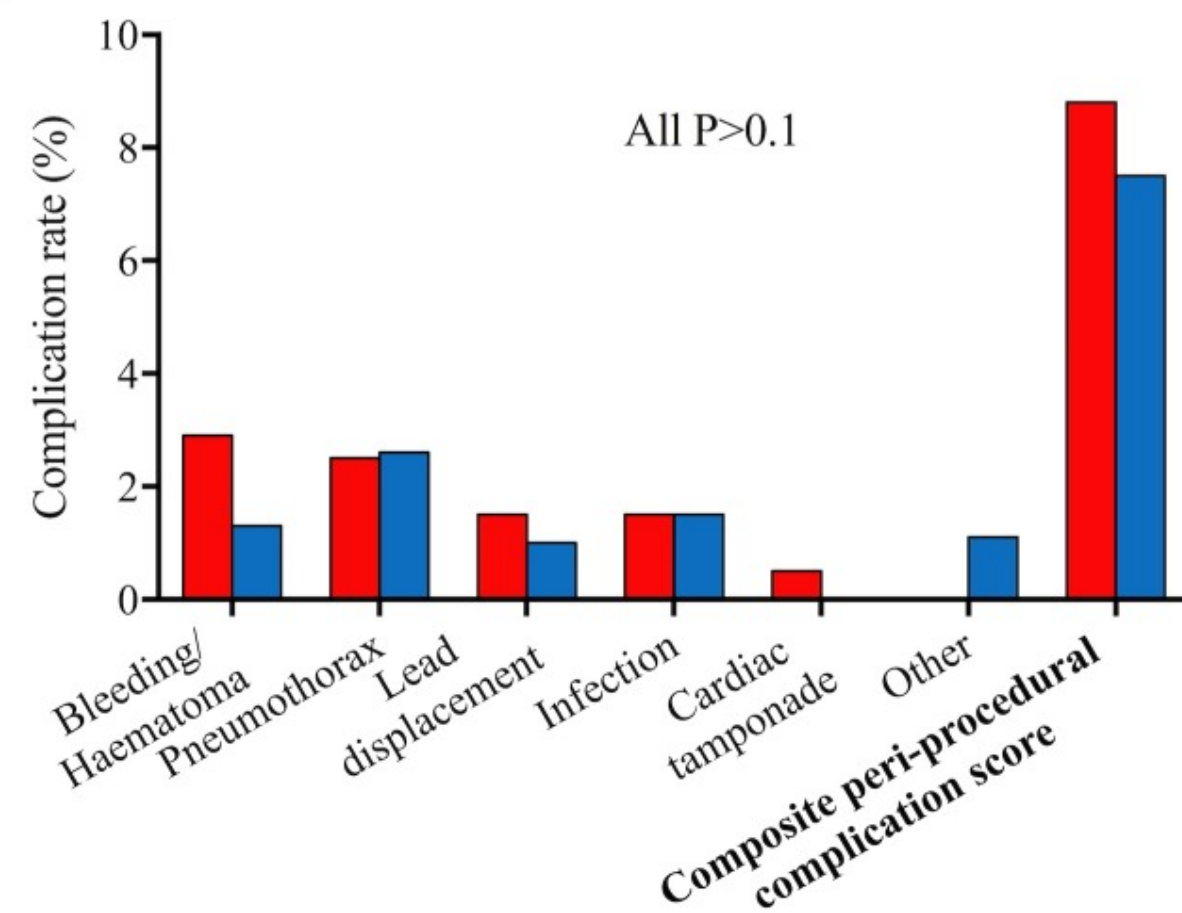
Ventricular pacing has traditionally been performed from the RV apex. Since the introduction of active fixation leads, alternative pacing sites such as the RVOT septum or the mid-septum have been evaluated in order to provide more physiological pacing. However, despite two decades of research, the clinical benefit of RV non-apical pacing remains uncertain.⁶⁷⁰ This may be partly explained by variabil-

2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

A.



B.



2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

Recommendation	Class ^a	Level ^b
CRT rather than RV pacing is recommended for patients with HFrEF (<40%) regardless of NYHA class who have an indication for ventricular pacing and high-degree AVB in order to reduce morbidity. This includes patients with AF. ^{183,190,196,268,313,323,357–359,361,362}	I	A

HBP may be considered as an alternative to RV pacing in patients with AVB and LVEF >40%, who are anticipated to have >20% ventricular pacing. ^{42,433}	IIb	C
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NEWS FROM THE HEART RHYTHM SOCIETY

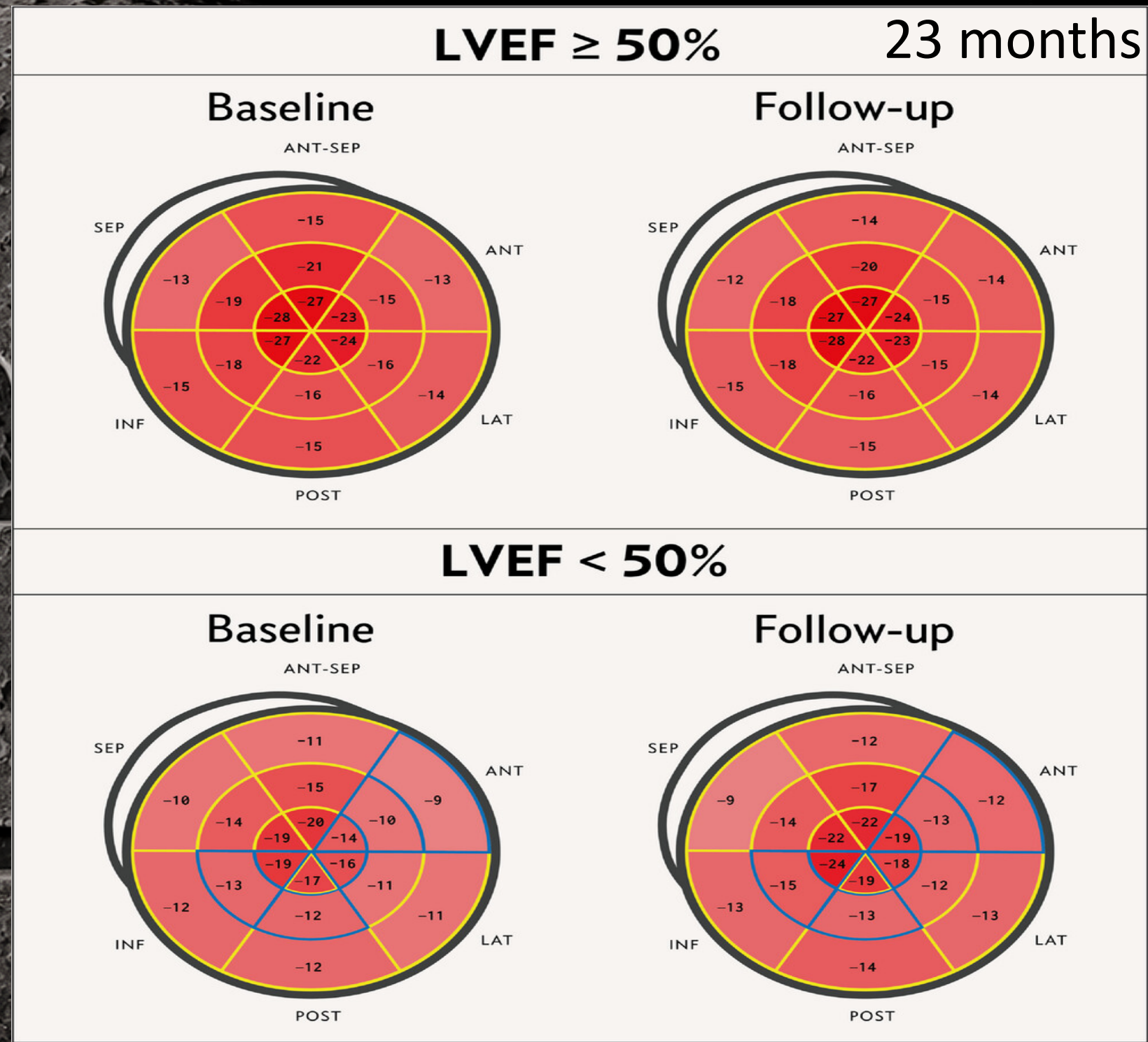
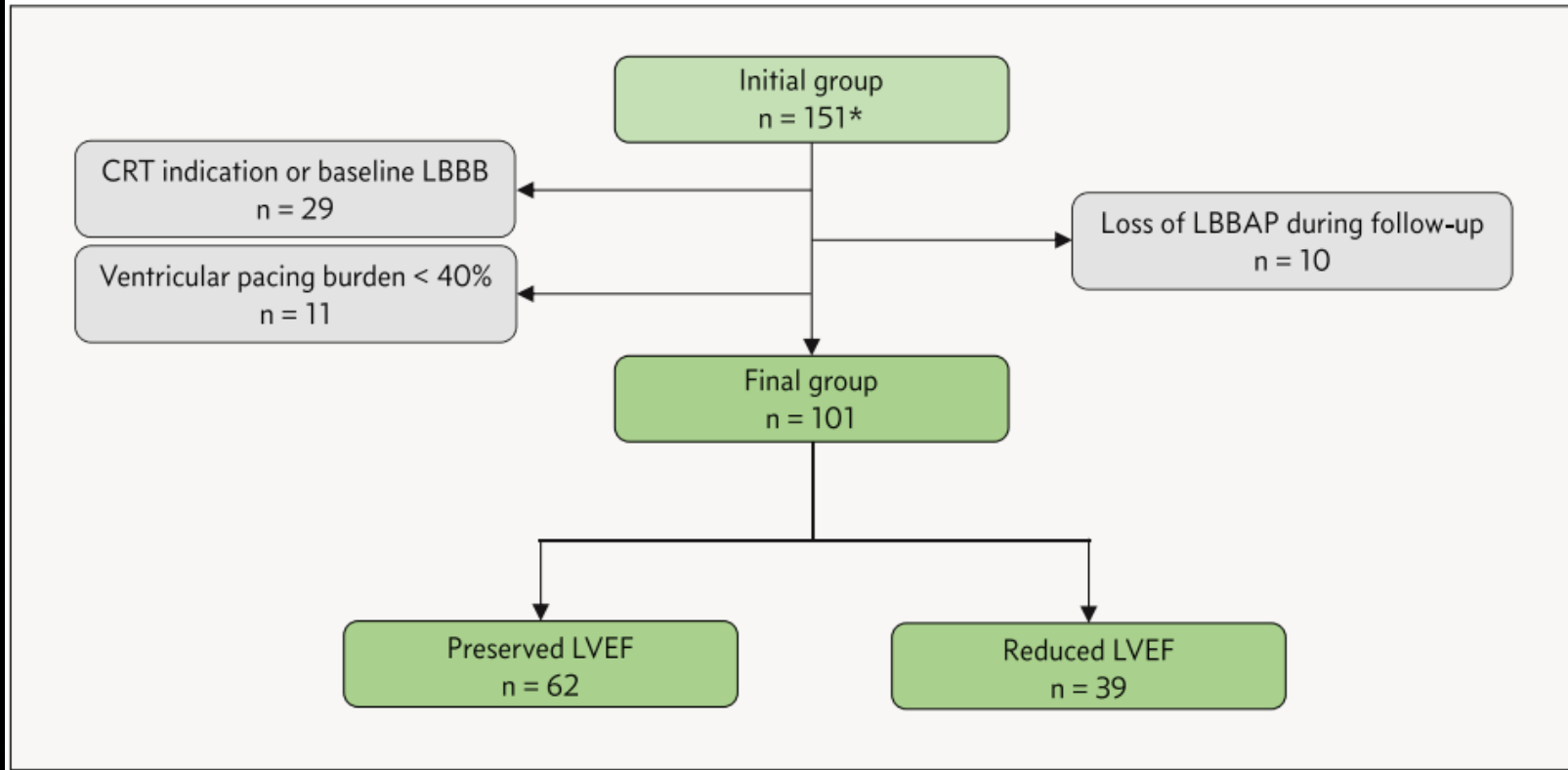
2023 HRS/APHRS/LAHRS guideline on cardiac physiologic pacing for the avoidance and mitigation of heart failure

3.1.1. Substantial ventricular pacing

Recommendations for substantial ventricular pacing		
COR	LOE	Recommendations
2a	B-R (CRT) B-NR (HBP, LBBAP)	1. In patients with an indication for permanent pacing with an LVEF 36%–50% who are anticipated to require substantial ventricular pacing, CPP is reasonable to reduce the risk of PICM.
2b	B-NR	2. In patients with normal LVEF who are anticipated to require substantial ventricular pacing, it may be reasonable to treat patients with CPP to reduce the risk of PICM.

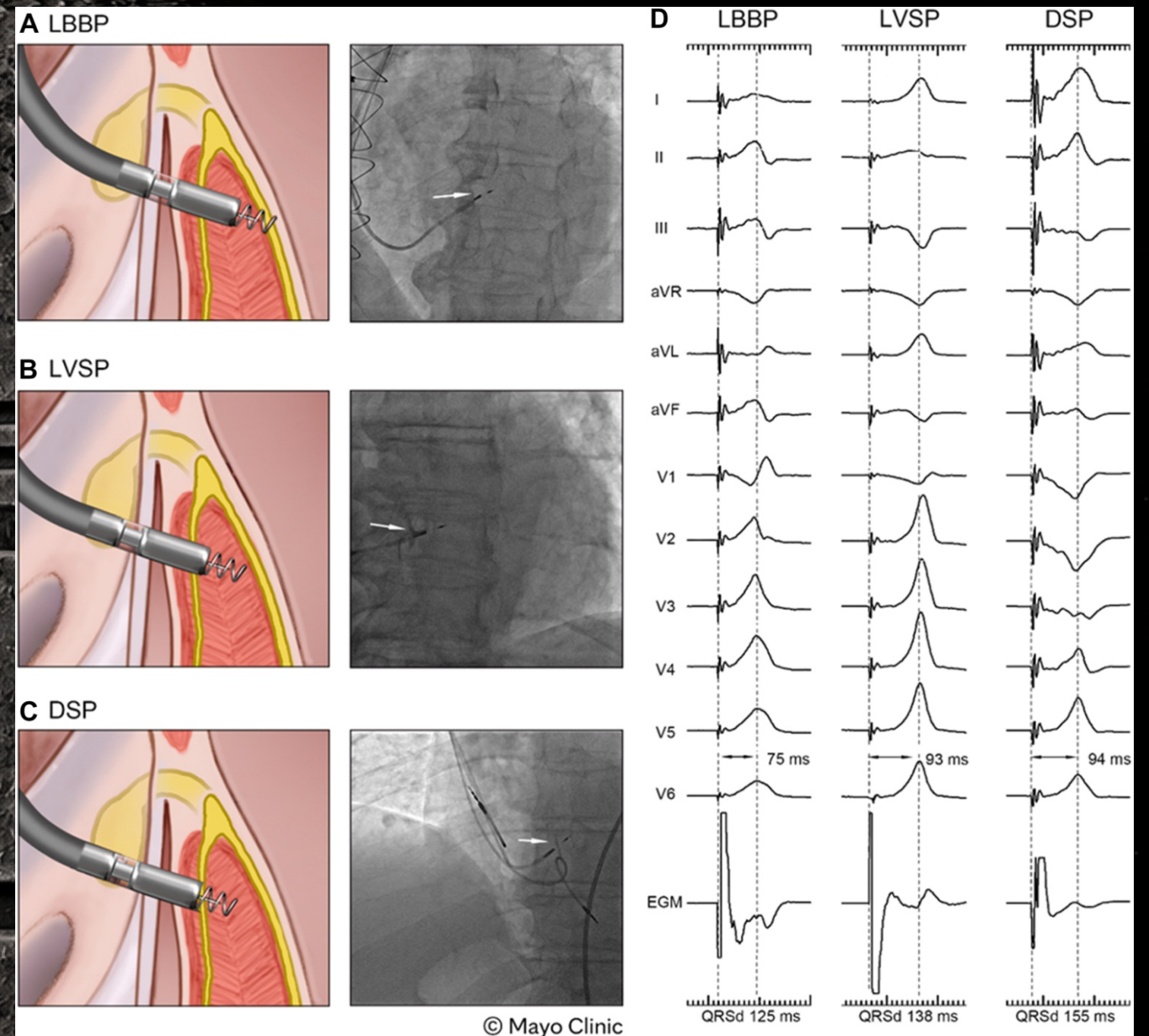
Recommendations for less than substantial ventricular pacing		
COR	LOE	Recommendations
2a	B-R	1. In patients with an indication for permanent pacing with LVEF >35% who are anticipated to require less than substantial ventricular pacing, it is reasonable to choose a traditional RV lead placement and minimize RVP.
2b	C-LD	2. In patients with an indication for permanent pacing with LVEF 36%–50% who are anticipated to require less than substantial ventricular pacing, a CSP lead with HBP or LBBAP may be considered as an alternative to an RVP lead.
2b	C-LD	3. In patients with an indication for permanent pacing, LVEF 36%–50% and LBBB, and who are anticipated to require less than substantial ventricular pacing, CPP may be considered to potentially improve symptoms and LVEF.
2b	C-LD	4. In patients who are undergoing permanent pacing with normal LVEF and are anticipated to require less than substantial ventricular pacing, an LBBAP lead may be considered as an alternative to an RVP lead.
3: No Benefit	B-R	5. In patients with normal LVEF who are anticipated to require less than substantial ventricular pacing, CRT with BiV pacing is not indicated.

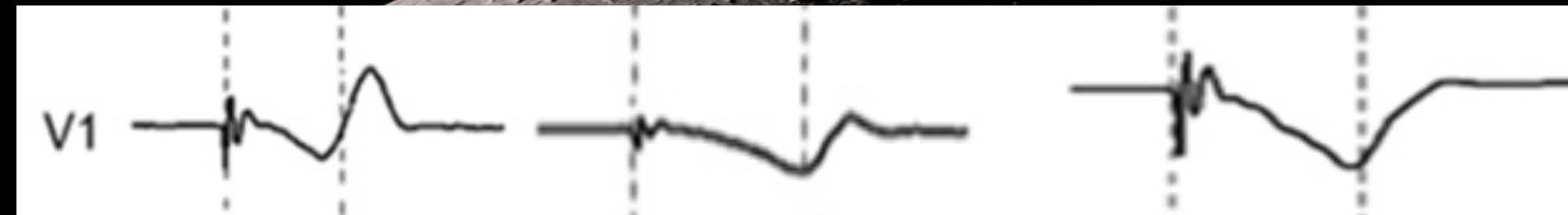
abstract



Left bundle branch

...unge con la vite la profondità del SIV
 ...ocardio sinistro.
 ...settale.

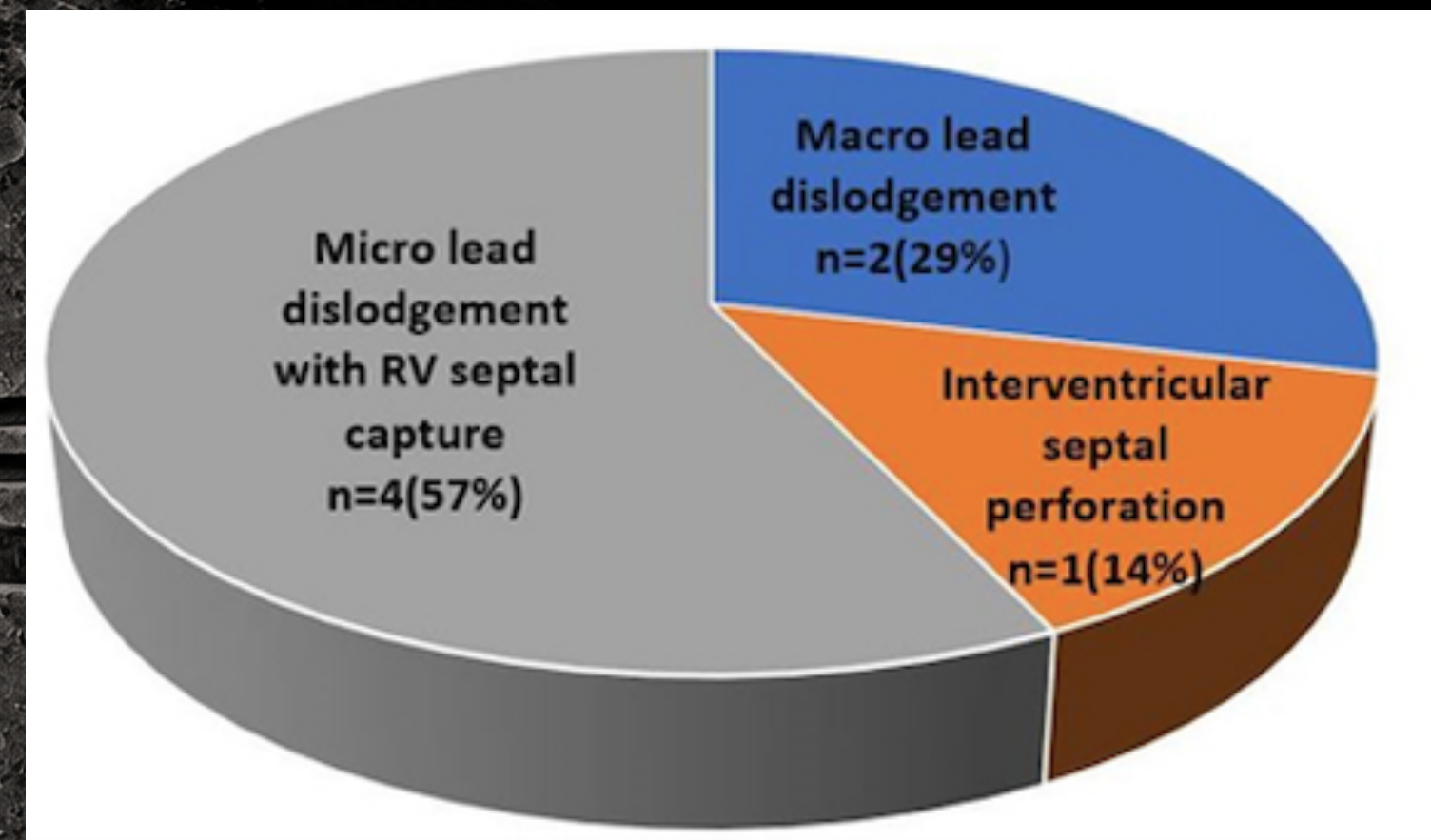
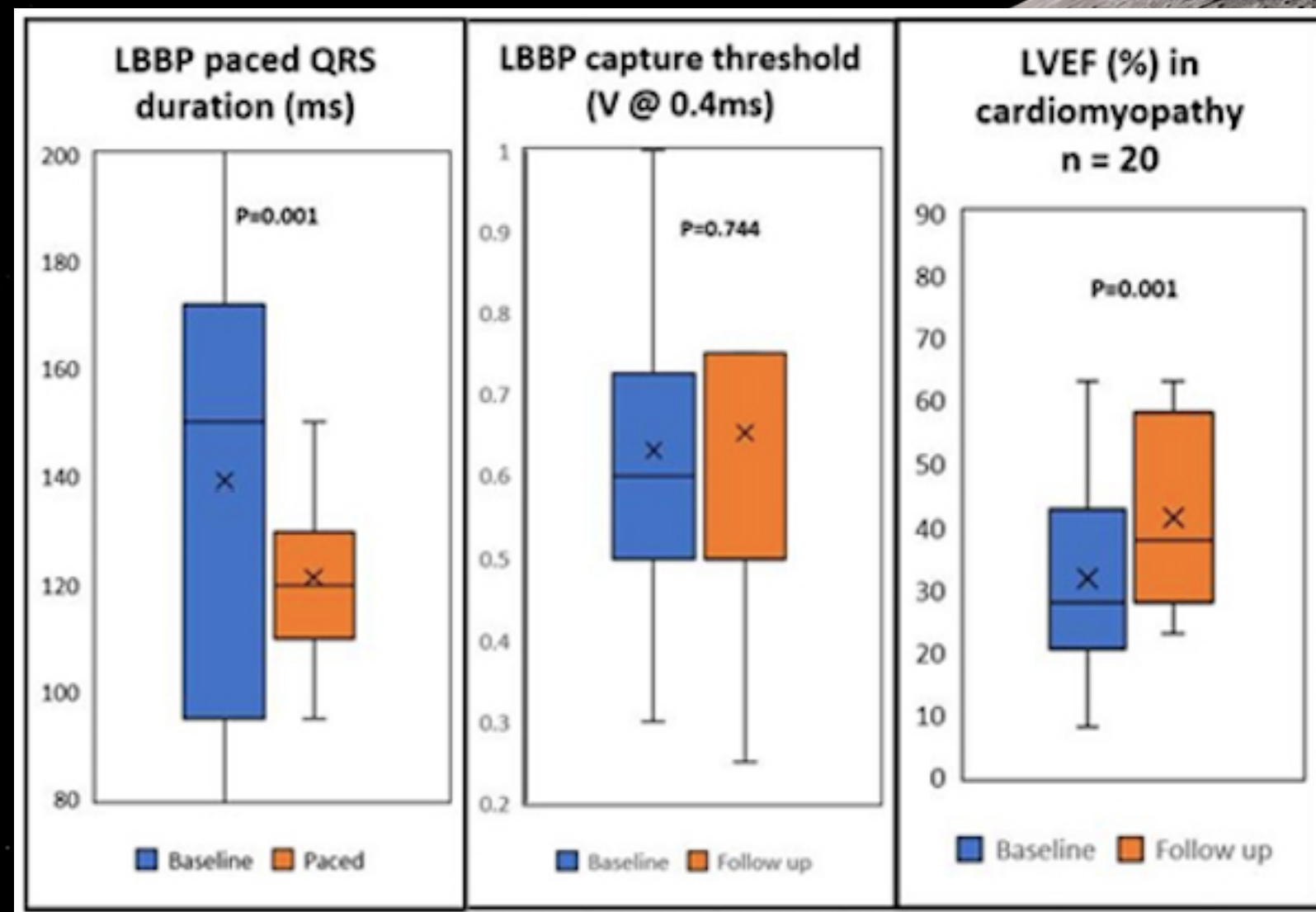




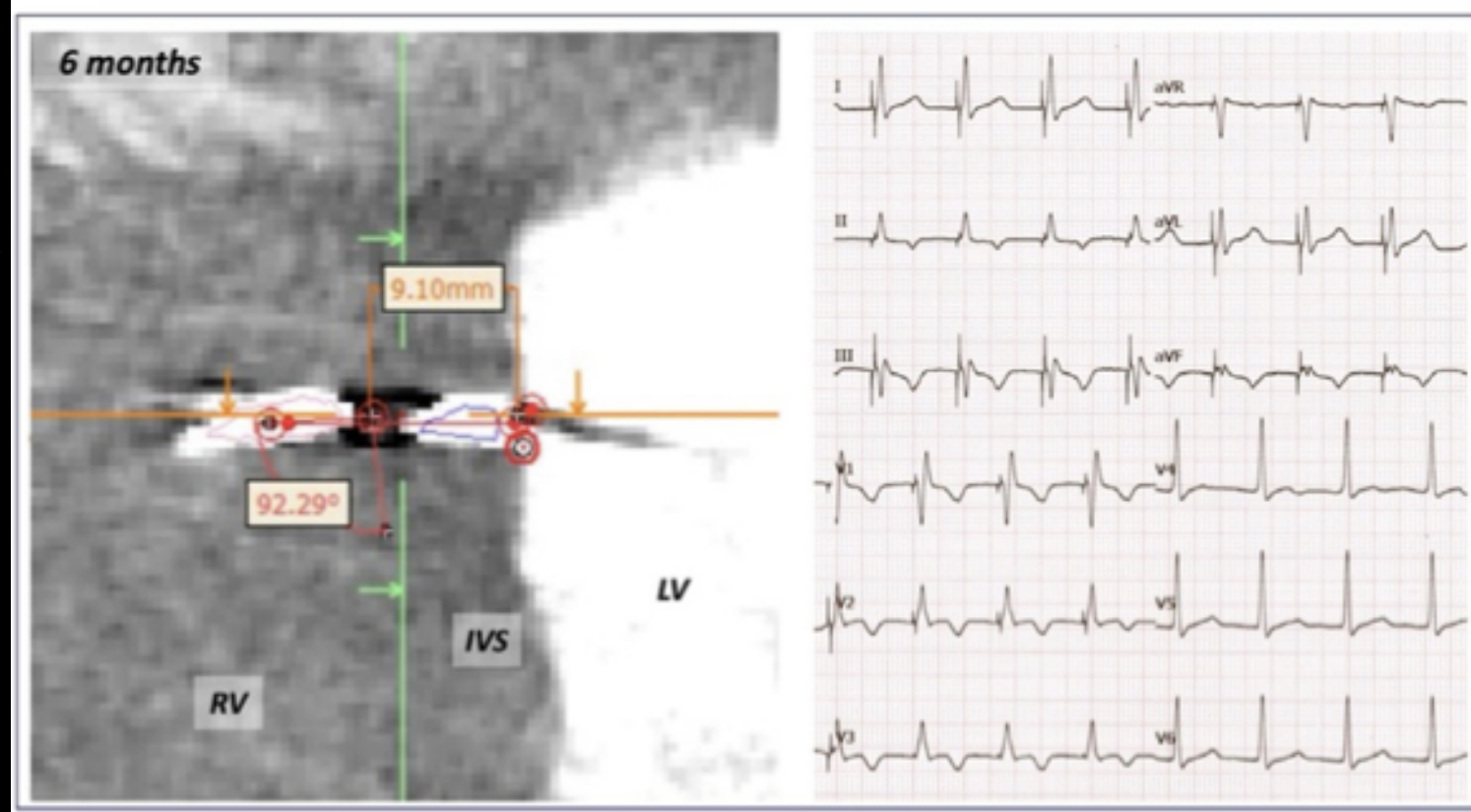
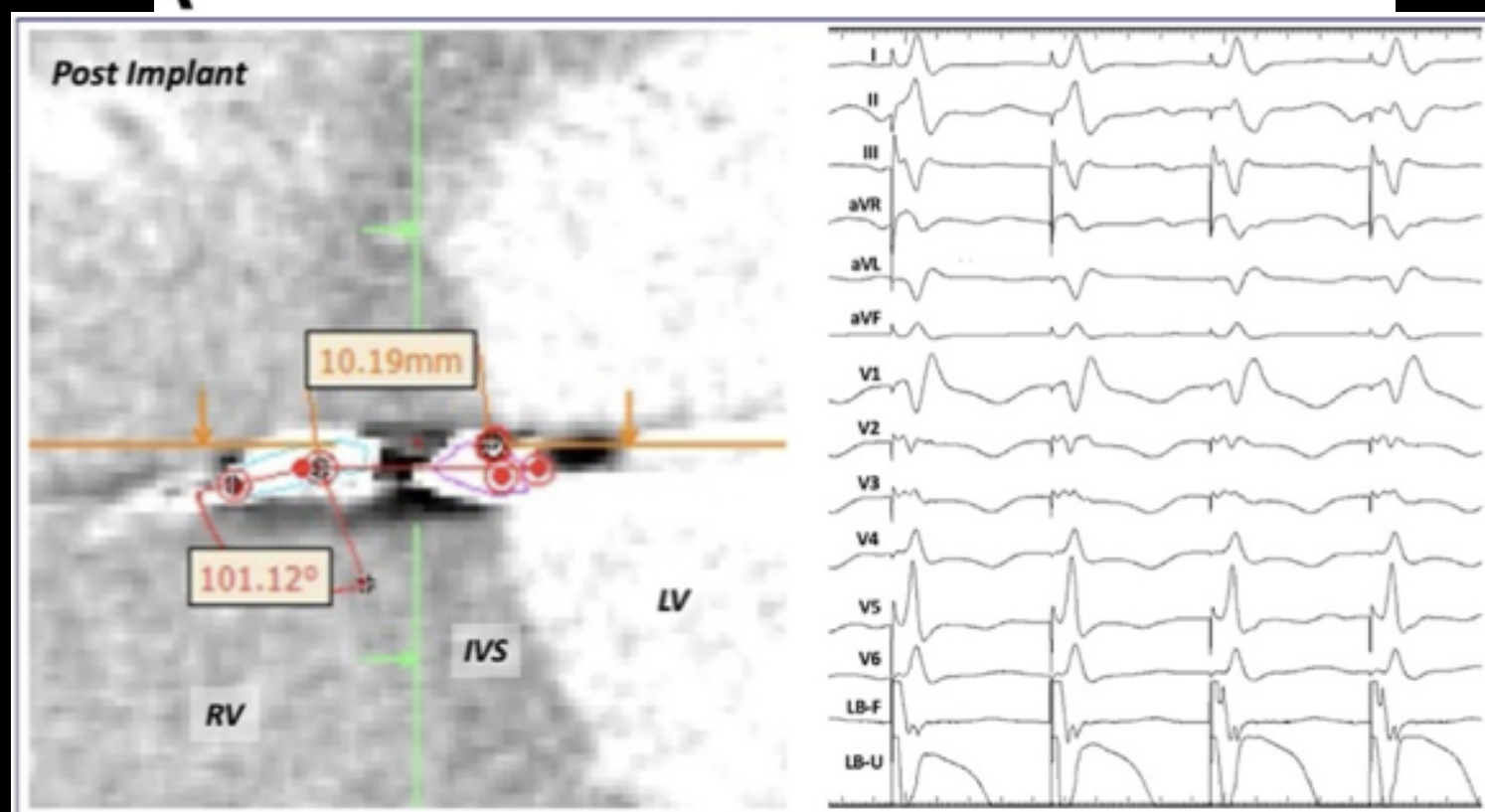
	LBBP	LVSP	DSP
Profondità Elettrodo	Subendocardico	Subendocardico	Intramurale Profondo
Morfologia V1	r/R' (RBBB)	RBBB	QS / rS
V6 RWPT	< 75-80 ms	> 80 ms	80-100 ms (Target QRS < 140ms)
Cattura Sistema Conduzione	Diretta	Retrograda indiretta	Nessuna / Fasciale
V6-V1 Interval	> 44 ms	~ 16 ms	Variabile



non è sicuro nel setto pro



12.3%



Esordio di fibrillazione

sempre associata a

anche di tipo

dinamica di

di

Senali di alta

(>3.5 V x 0.4 ms)

unipolare del QRS

fragmentato

Gestione con

guidata da

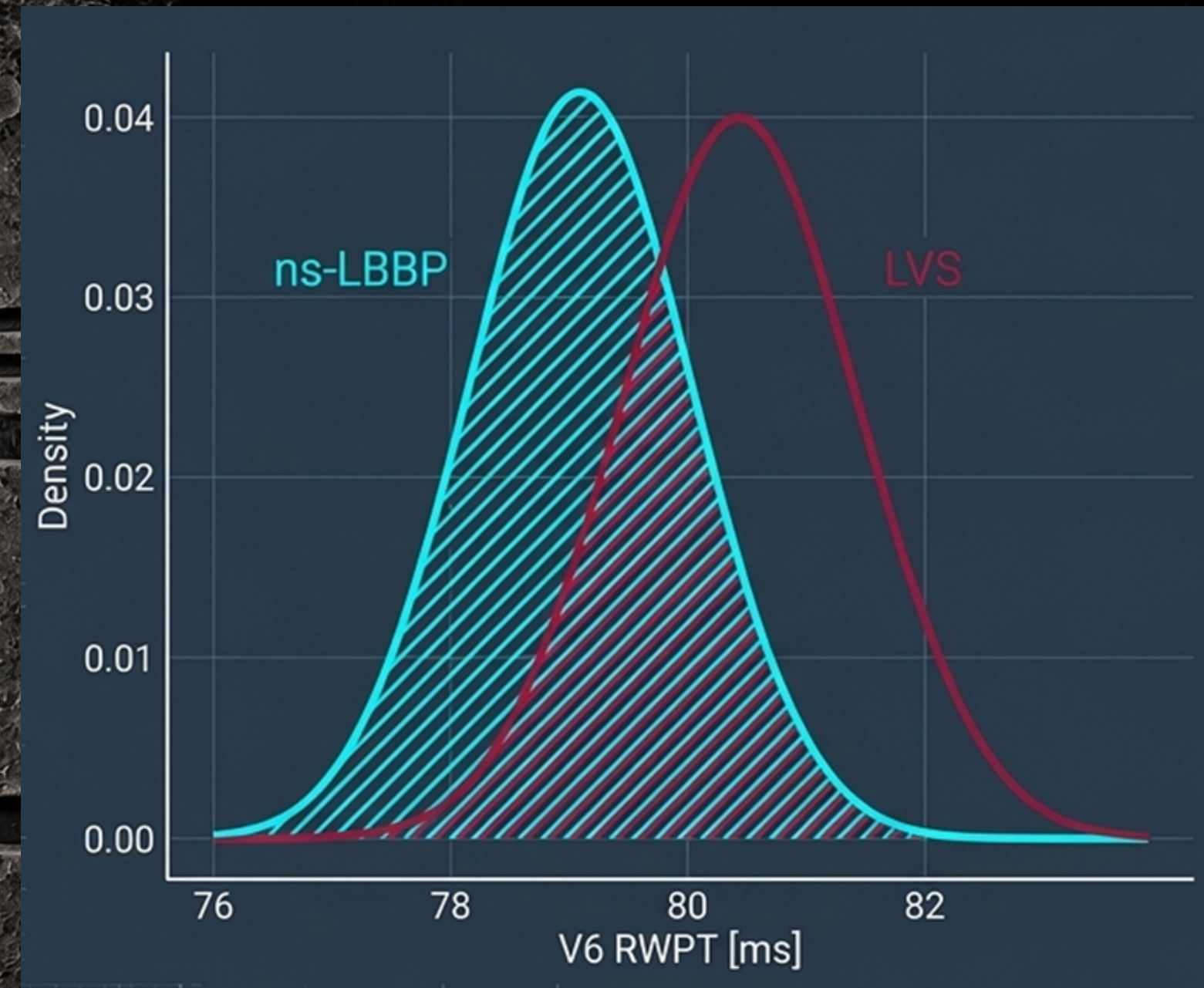
Prasad SS, Vijayaraman P. Septal Perforation During Left Bundle Branch Pacing: Into the Abyss of the Unknown. JACC Clin Electrophysiol. 2025

DEL V6 RWPT
classificazione che si rivela affidabile

La **classificazione**: in oltre il
caso, il V6 RWPT

La **classificazione** può essere influenzata da
fattori possono interagire
con il ventricolo sinistro al
preesistente (BBS) con
allungato

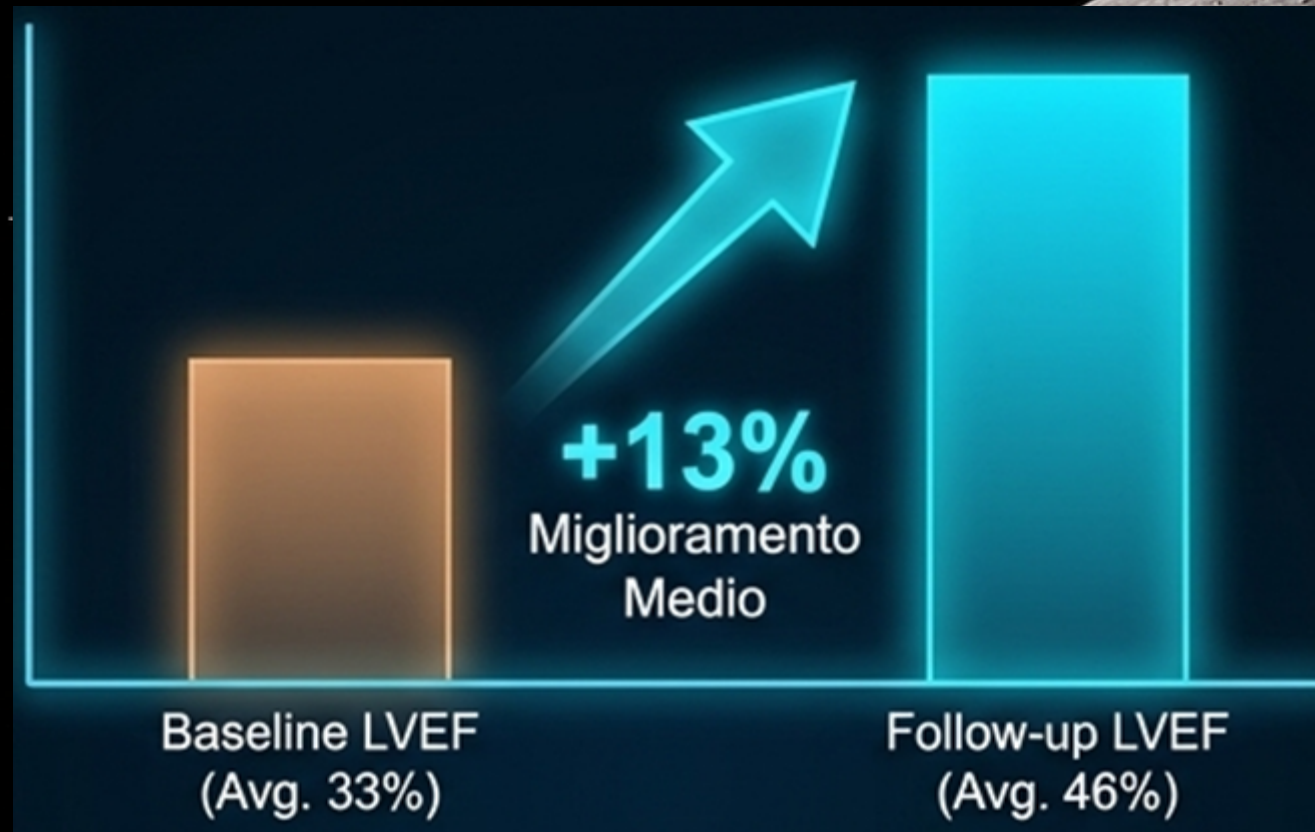
Pericolo clinico di affidarsi solo a questo criterio
rischiando di spingendoci a eseguire
diagnostica che **aumentano il**



Jinpioc



rimodellamento inverso



Un pacing sensibile

≤ 140 ms

La cattura del sistema

prerequisito assoluto

invertire la PICM

1 Recupero Frazione di Eiezione

Baseline: **33%** → Follow-up: **46%**
↑ (Miglioramento medio del +13%) ↑

2 Resincronizzazione Elettrica

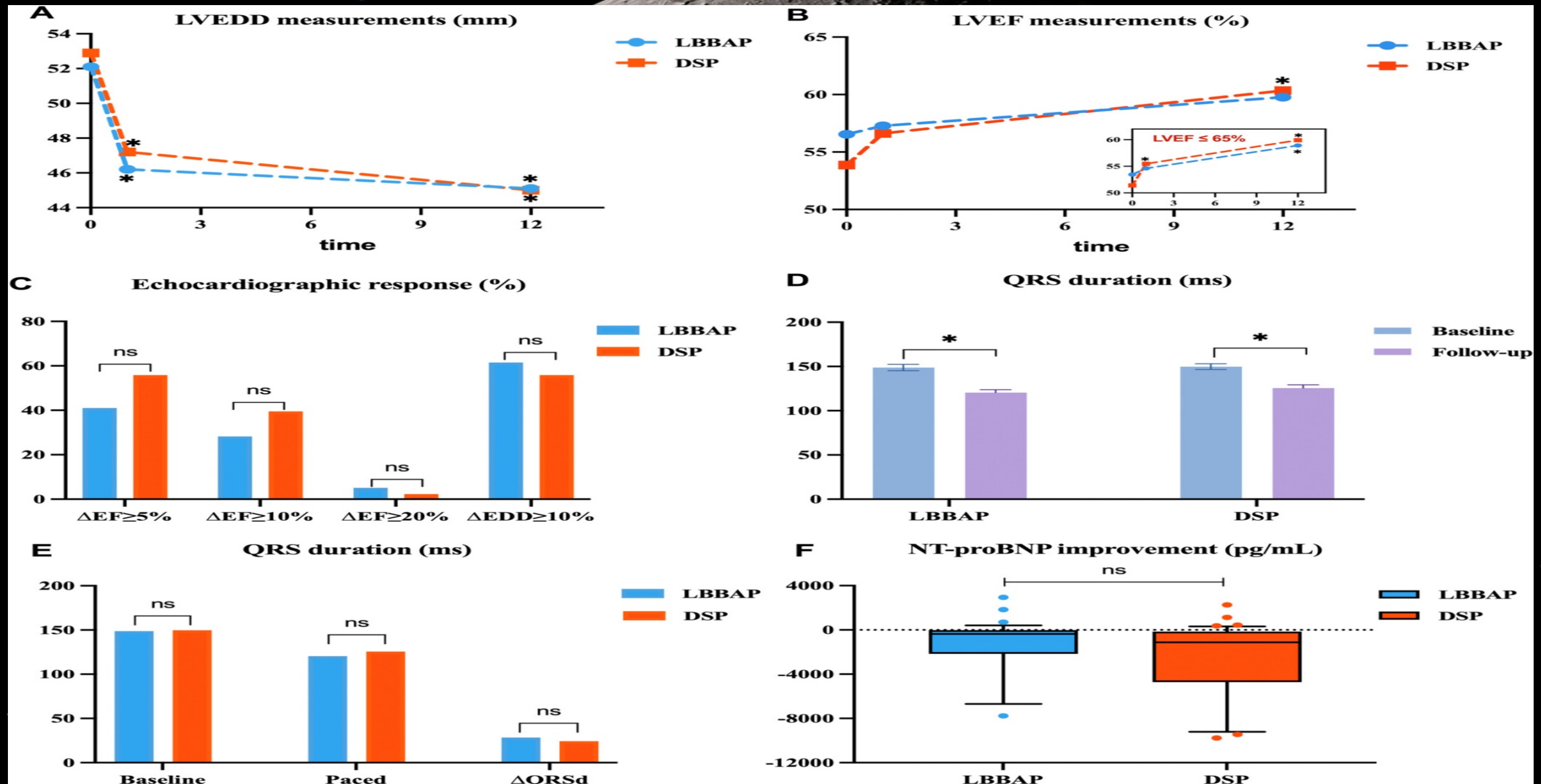
QRS RVP: **172 ms** → QRS DSP: **130 ms**
↓ (Riduzione di 42 ms) ↓

3 Successo Clinico

92%
(11 pazienti su 12 con incremento LVEF $\geq$ 5-10%)

LBBa pacing

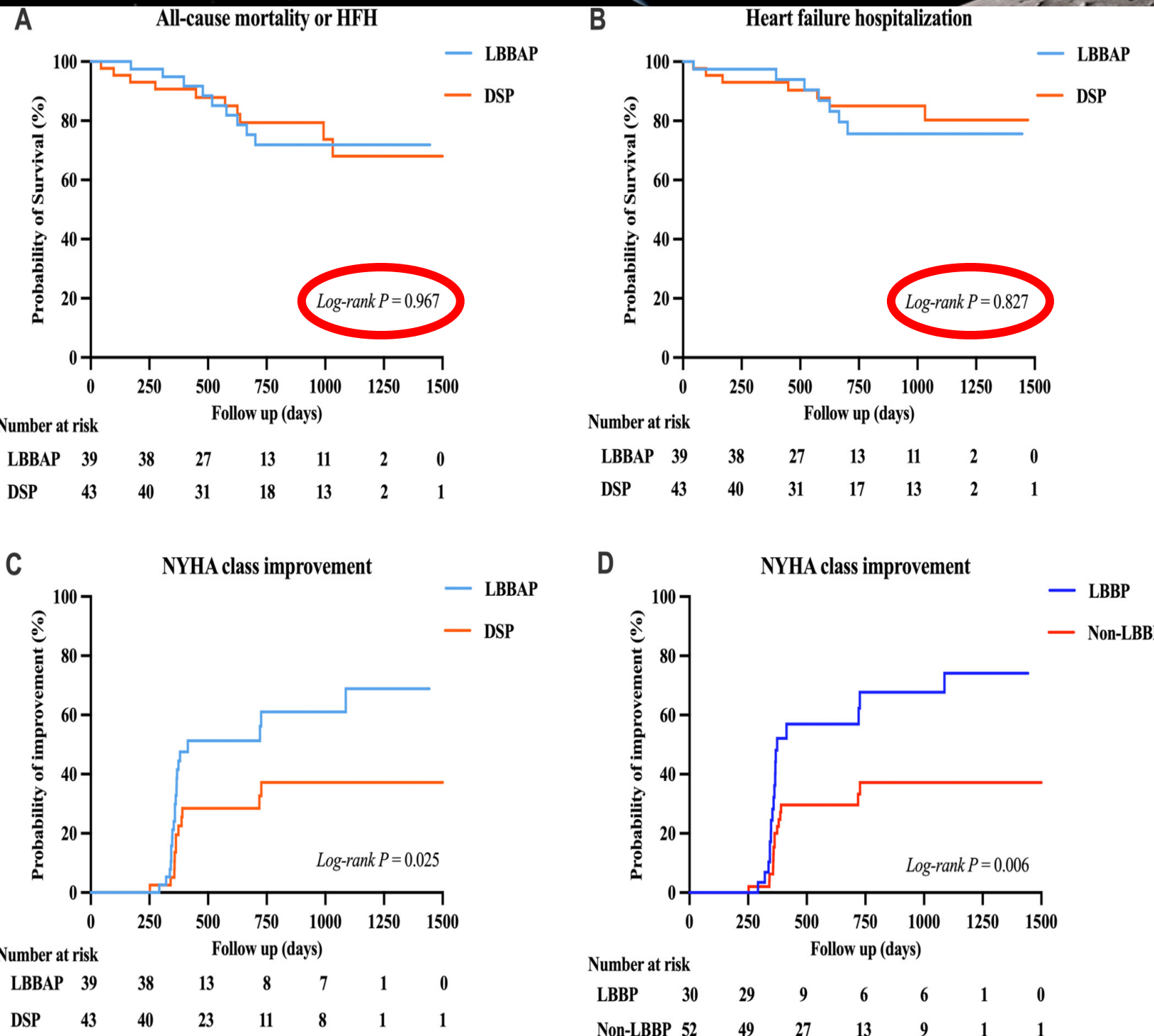
Deep septal pacing



Qu L, et al. Left Bundle Branch Pacing with a Catheter: A Randomized Controlled Trial

Oltre I sintomi

Hard End-Points



Equivalenza prognostica:

per mortalità

(23.1% LBBP vs 23.3% DSP)

Il compromesso sintomatico

superiore per LBBP

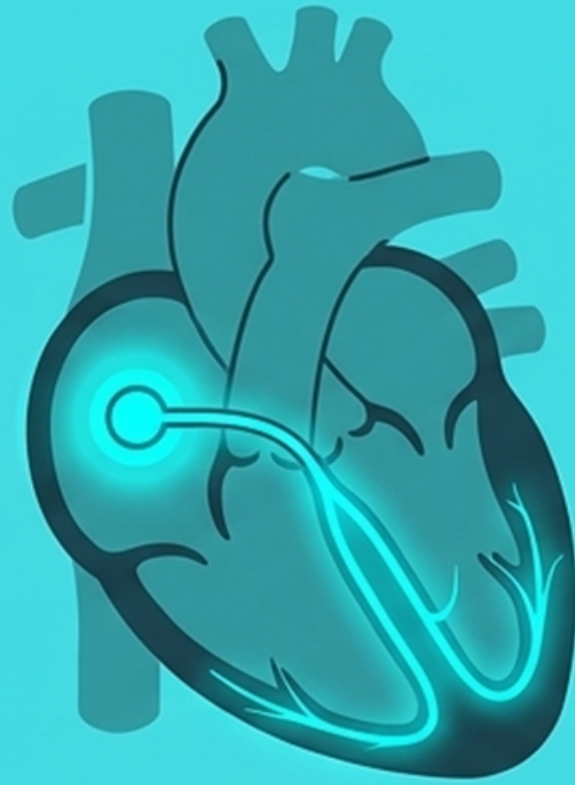
ma il DSP è superiore

anche nell'efficacia

Qu L, et al. Left Bundle Branch Pacing

with a Catheter Ablation

L'Ideale Teorico vs. La Realtà Procedurale



Left Bundle Branch Pacing (LBBP)

Sincronia fisiologica assoluta tramite il reclutamento diretto del sistema di conduzione.

Target Anatomico Millimetrico

Estrema variabilità e incostanza anatomica del fascio.

Curva di Apprendimento

Ripida curva di apprendimento con elevati tempi di fluoroscopia.

Sistemi EP Complessi

Necessità di complessi sistemi di registrazione in sala per mappare il potenziale.

Rischio di Perforazione

Pericolo di penetrazione nel subendocardio e nella cavità ventricolare sinistra.



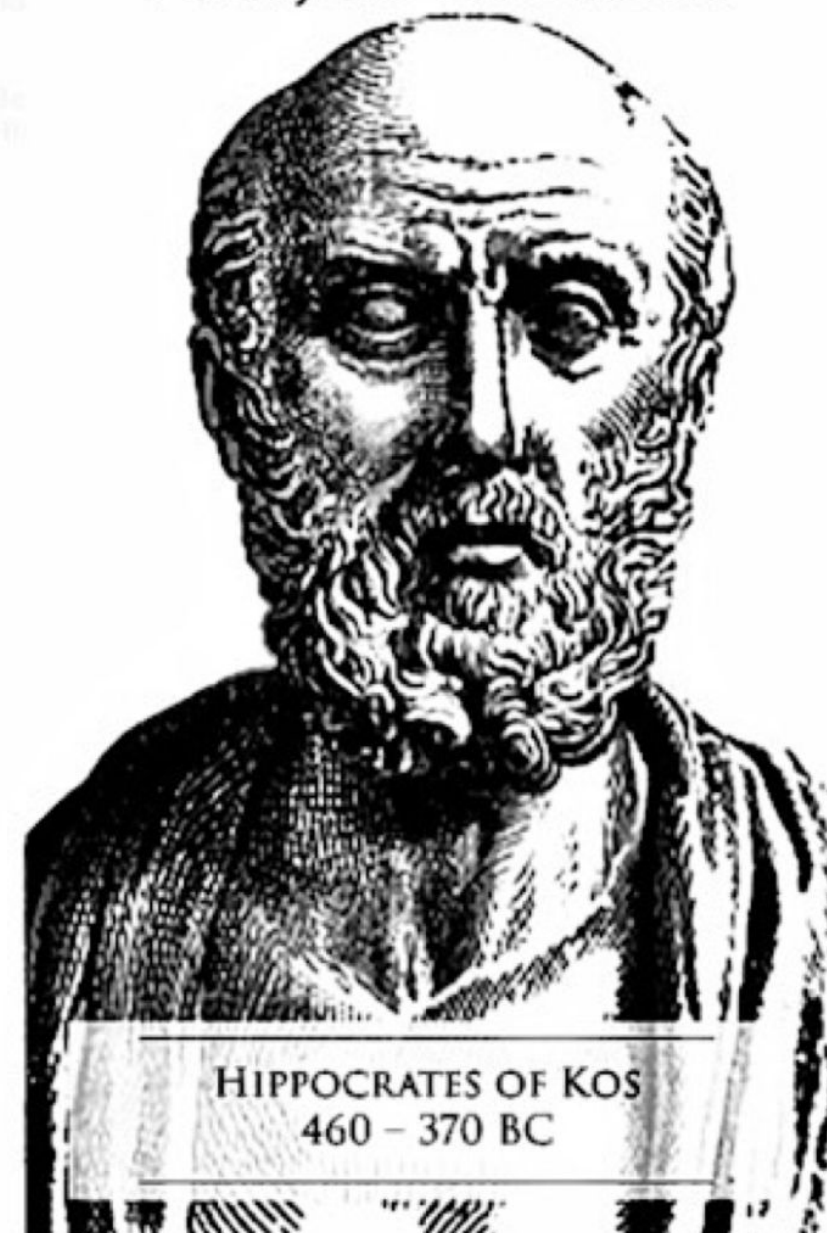
*non necessità di sistemi di
per mappare il potenziale di branca*

*e: curva di apprendimento decisamente
i fluoroscopia ridotti rispetto al LBBP*

*a: rischio quasi nullo di perforazione
ale danno alle strutture valvolari*

*ari e binari: diagnosi in tempo reale.
< 140 ms. Non definizioni materon*

"Primum non nocere"
"First, do no harm"



Lo “Sweet Spot” Fisiologico: Sintesi dell’Equilibrio





clinical

ultrasonograficamente sottile e
spesse o fragilità tissutale

frazione d'eiezione
dimensione cardiaco

con BBS il DSP presenta
anormale

prima della procedura il DSP

