

L'indicazione all'ICD.

I nuovi dispositivi senza cateteri

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L'indicazione all'ICD.

MORTE CARDIACA IMPROVVISA:

Morte non traumatica, inaspettata che occorre entro 1 ora dall' esordio dei sintomi in un soggetto apparentemente sano.

PREVENZIONE PRIMARIA SCD

Terapie e/o device in pazienti che sono a rischio di morte cardiaca improvvisa **MA NON** hanno avuto arresto cardiaco o aritmie potenzialmente fatali

PREVENZIONE SECONDARIA SCD

Terapie e/o device in pazienti che **HANNO GIA'** sperimentato **arresto cardiaco** o **aritmie potenzialmente fatali** (es tachicardia ventricolare sostenuta)

PREVENZIONE SECONDARIA SCD

ICD for the **secondary prevention** of sudden cardiac death and ventricular tachycardia

Recommendations	Class ^a	Level ^b	Ref.
ICD implantation is recommended in patients with <u>documented VF</u> or <u>haemodynamically not tolerated VT in the absence of reversible causes</u> or within 48 h after myocardial infarction who are <u>receiving chronic optimal medical therapy</u> and have a reasonable expectation of survival with a good functional status > 1 year.	I	A	151–154
ICD implantation should be considered in patients with <u>recurrent sustained VT</u> (not within 48 h after myocardial infarction) who are receiving chronic optimal medical therapy, have a normal LVEF and have a reasonable expectation of survival with good functional status for > 1 year.	IIa	C	This panel exper

AVID/CIDS/CASH



ICD vs AMIODARONE



meta-analysis dei 3 trials

ICD →

↓ 50% mortalità aritmica

↓ 28% mortalità totale

ESC GL 2015



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PREVENZIONE PRIMARIA SCD

L'indicazione all' ICD

Implantable cardioverter defibrillator in patients with left ventricular dysfunction

Recommendations	Class ^a	Level ^b	Ref. ^c
ICD therapy is recommended to reduce SCD in patients with symptomatic HF (NYHA class II–III) and LVEF \leq 35% after \geq 3 months of optimal medical therapy who are expected to survive for at least 1 year with good functional status:			

– Ischaemic aetiology (at least 6 weeks after myocardial infarction).	I	A	63,64
– Non-ischaemic aetiology.	I	B	64,316, 317

NYHA II-III

LVEF < 35%

Ischemici e **NON** ischemici !!

ESC GL 2015

L'indicazione all'ICD associato alla CRT (CRT-D)

Table A. Cardiac resynchronization therapy in the primary prevention of sudden death in patients in sinus rhythm and New York Heart Association functional class III/ambulatory class IV

Recommendations	Class ^a	Level ^b	Ref. ^c
CRT is recommended to reduce all-cause mortality in patients with an <u>LVEF ≤ 35% and LBBB</u> despite at least 3 months of optimal pharmacological therapy who are expected to survive at least 1 year with good functional status:			322–326
– With a <u>QRS duration > 150 ms</u>	I	A	313, 314, 327–329
– With a <u>QRS duration of 120–150 ms</u>	I	B	313, 314
CRT should or may be considered to reduce all-cause mortality in patients with an <u>LVEF ≤ 35% without LBBB</u> despite at least 3 months of optimal pharmacological therapy who are expected to survive at least 1 year with good functional status:			326, 323–325
– With a QRS duration > 150 ms	IIa	B	313, 314
– With a QRS duration of 120–150 ms	IIb	B	313, 314

ESC GL 2015

LVEF ≤ 35%

LBBB

OPT

QRS ≥ 120-150

L'indicazione all'ICD associato alla CRT (CRT-D)

Table C. Cardiac resynchronization therapy defibrillator^a in the primary prevention of sudden death in patients in **sinus rhythm** with mild (New York Heart Association **class II**) heart failure

Recommendations	Class ^b	Level ^c	Ref. ^d
CRT-D is recommended to reduce all-cause mortality in patients with a <u>QRS duration ≥ 130 ms, with an LVEF $\leq 30\%$ and with LBBB</u> despite at least 3 months of optimal pharmacological therapy who are expected to survive at least 1 year with good functional status.	I	A	148, 322, 323, 325, 327, 329
CRT-D may be considered to prevent hospitalization for HF in patients with a <u>QRS duration ≥ 150 ms, irrespective of QRS morphology, and an LVEF $\leq 35\%$</u> despite at least 3 months of optimal pharmacological therapy who are expected to survive at least 1 year with good functional status.	IIb	A	148, 327–329, 334

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QRS ≥ 130

LVEF $\leq 30\%$

LBBB

OPT

QRS ≥ 150

LVEF $\leq 35\%$

No matter QRS morphology

But... What to do in a pt with QRS 140, no LBBB, EF 32% ???

L'indicazione all'ICD associato alla CRT in AF

ESC GL 2015

Table B. Cardiac resynchronization therapy in the primary prevention of sudden death in patients with permanent atrial fibrillation in New York Heart Association functional class III/ambulatory class IV

Recommendations	Class ^a	Level ^b	Ref. ^c
CRT should be considered to reduce all-cause mortality in patients with chronic HF, QRS \geq 120 ms and LVEF \leq 35% who remain in NYHA functional class III/ambulatory class IV despite at least 3 months of optimal pharmacological therapy who are expected to survive at least 1 year with good functional status, <u>provided that biventricular pacing as close as possible to 100% can be achieved.</u>	IIa	B	330, 331
AV junction ablation should be considered in case of incomplete biventricular pacing.	IIa	B	332, 333

QRS \geq 120

LVEF \leq 35%

NYHA III-IV

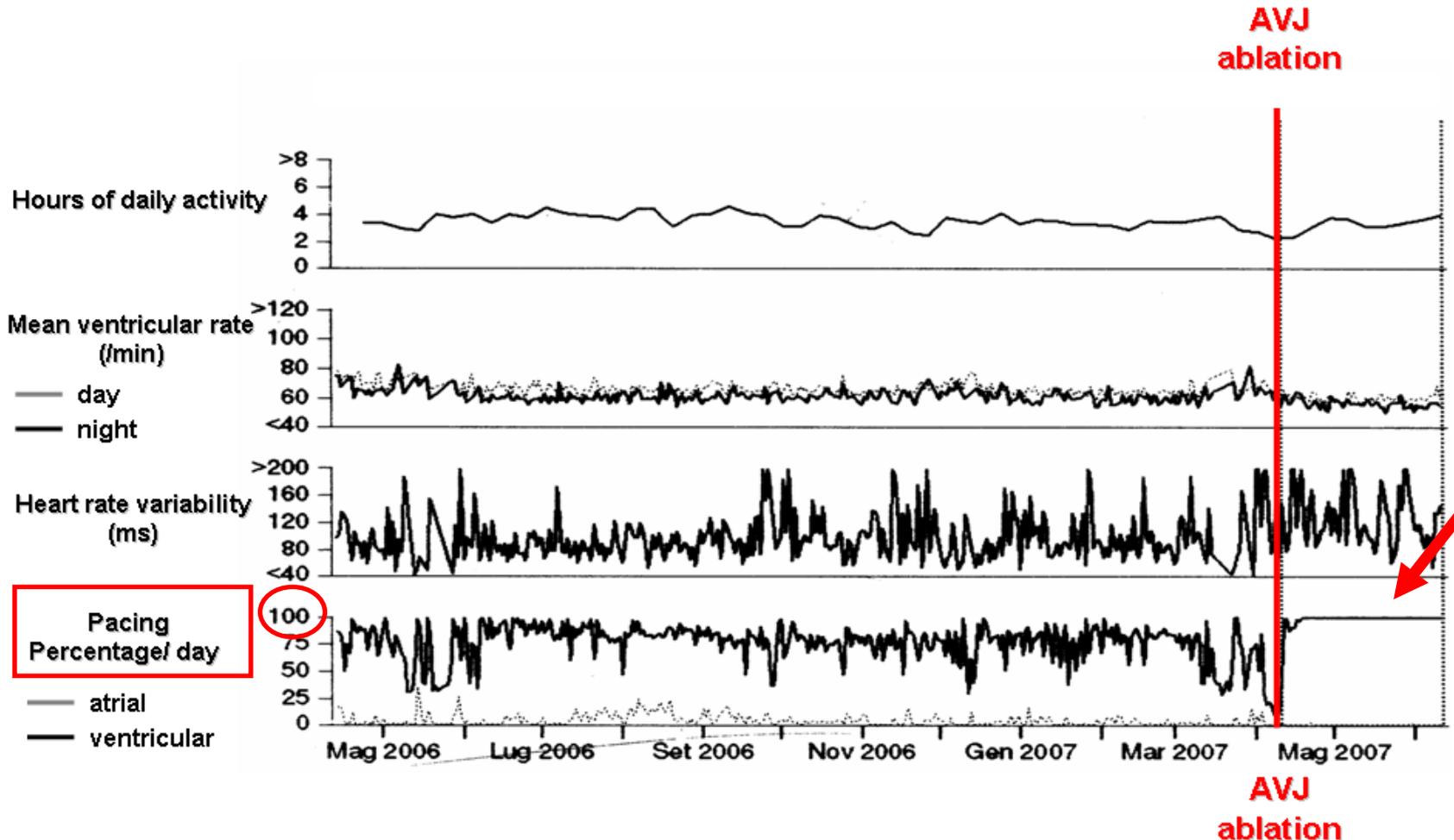


100% pacing BIV necessario



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Nella pratica clinica, molto spesso nei pz CRT + FA ,
l'ablazione del nodo è indispensabile per 100% BIV pacing ...



ICD nelle altre cardiopatie

ESC GL 2015

Indicazione di Classe I in
prev secondaria in tutte
le cardiopatie

Prevention of sudden cardiac death in patients with hypertrophic cardiomyopathy

Recommendations	Class ^a	Level ^b
ICD implantation is recommended in patients who have survived a cardiac arrest due to VT or VF or who have spontaneous sustained VT causing syncope or haemodynamic compromise and a life expectancy >1 year.	I	B

Risk stratification and management of patients with arrhythmogenic right ventricular cardiomyopathy

ICD implantation is recommended in patients with a history of aborted SCD and haemodynamically poorly tolerated VT.	I	C
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Risk stratification and management in Long QT Syndrome

ICD implantation with the use of beta-blockers is recommended in LQTS patients with previous cardiac arrest.	I	B
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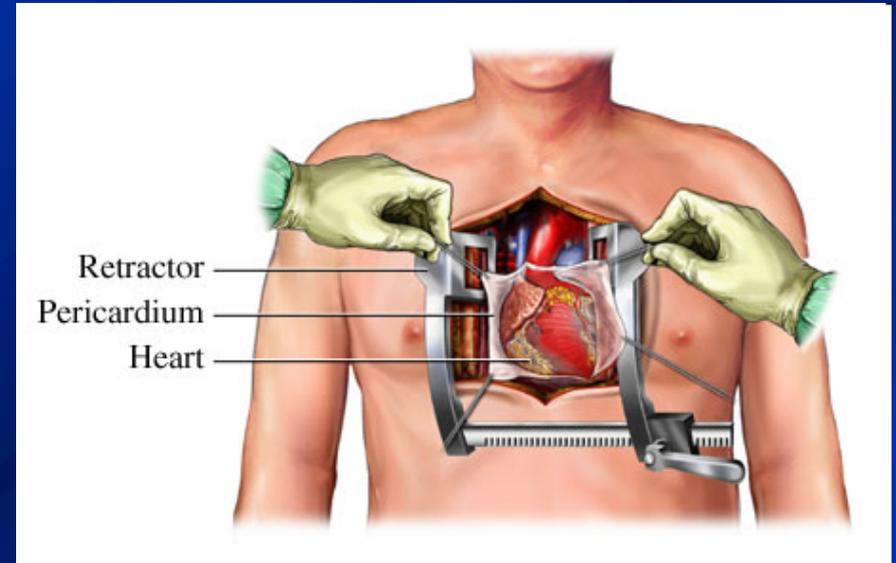
Risk stratification and management in Short QT Syndrome

Short QT Syndrome			
Recommendations	Class ^a	Level ^b	F
ICD implantation is recommended in patients with a diagnosis of SQTS who	I	C	
(a) Are survivors of an aborted cardiac arrest, and/or			
(b) Have documented spontaneous sustained VT.			

Risk stratification and management in Brugada Syndrome

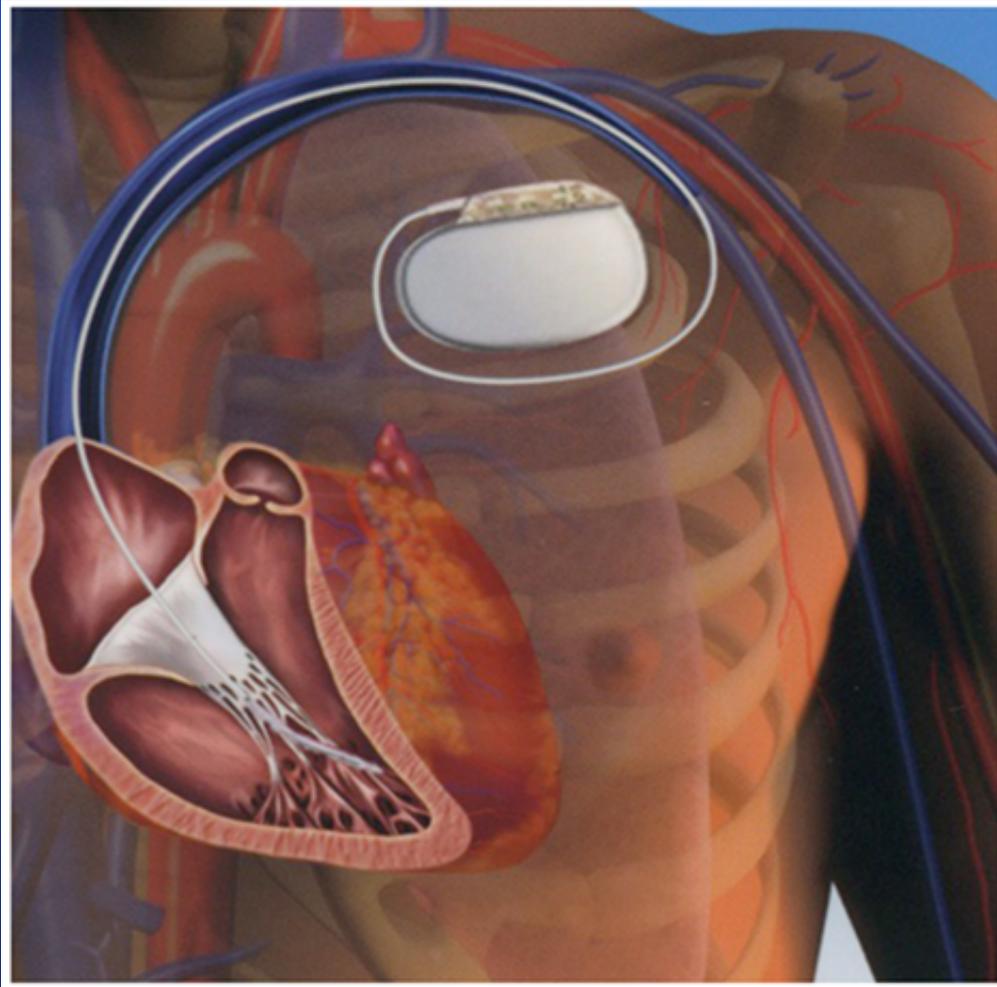
ICD implantation is recommended in patients with a diagnosis of Brugada syndrome who	I	C	
(a) Are survivors of an aborted cardiac arrest and/or			
(b) Have documented spontaneous sustained VT.			

Impianto ICD : Dalla cardiocirurgia in passato...



Procedura invasiva,
a torace aperto
9.7% mortalità perioperatoria

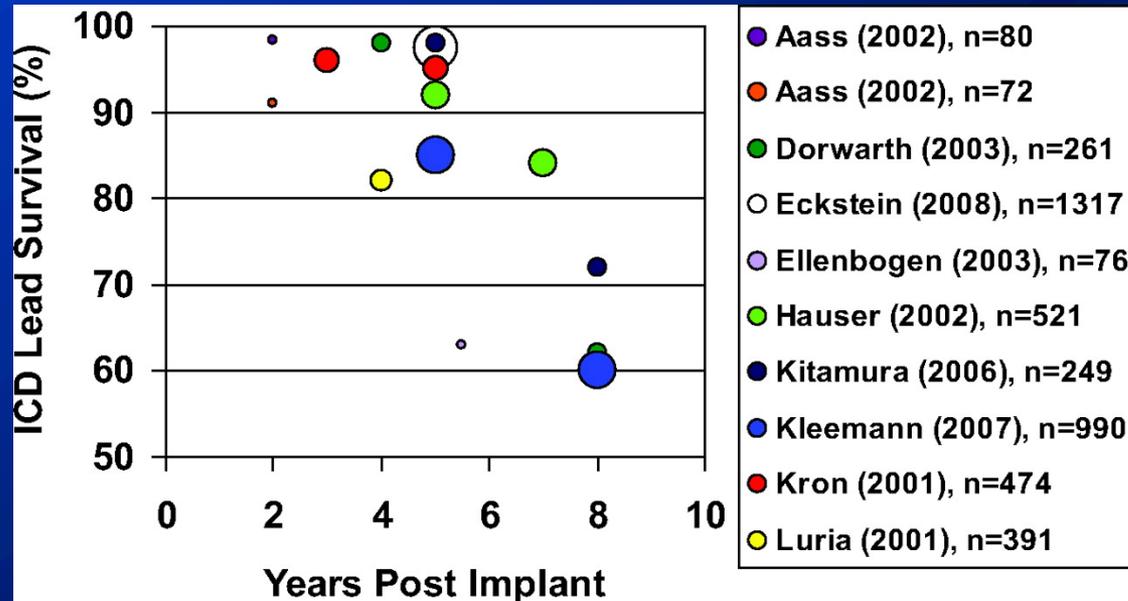
.. All'attuale impianto endocardico



- ICD affermatosi come terapia standard per prevenire SCD
- Cateteri posizionati direttamente sul o nel cuore

Complicanze ICD

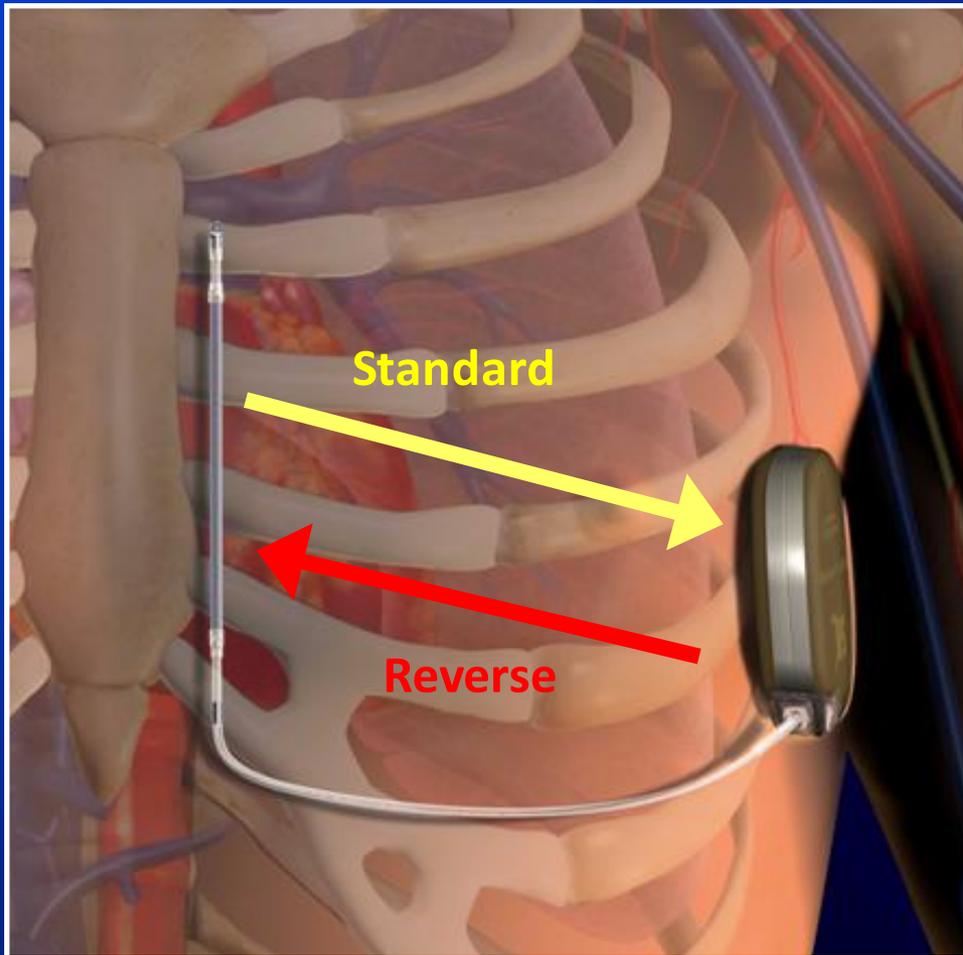
- Infezione → Estrazione
- Affidabilità elettrocatteteri



% probabilità di sopravvivenza da malfunzionamento degli elettrocatteteri ICD:
da 91 a 99% a 2 anni
da 85 a 98% a 5 anni
da 60 a 72% a 8 anni

Il Sistema S-ICD

L'approccio sottocutaneo



Nessun catetere nel sistema venoso o nel cuore
Impianto semplice chirurgicamente

- No fluoro/3 incisioni
- 80J (5 shocks per episodio) in $\sim 9s$
- Forma d'onda bifasica
- Polarità shock adattativa

TUTTAVIA...

- No anti-brady pacing
- No ATP
- **NO HOME MONITORING**
- Post shock pacing max 30s, 50 bpm

\$ Costo 4 volte dell' ICD convenzionale !!

Subcutaneous implantable cardioverter defibrillator

Recommendations	Class ^a	Level ^b	Ref. ^c
Subcutaneous defibrillators <u>should</u> be considered as an <u>alternative</u> to transvenous defibrillators in patients with an indication for an ICD when <u>pacing therapy for bradycardia support, cardiac resynchronization or antitachycardia pacing is not needed.</u>	IIa	C	157, 158
The subcutaneous ICD may be considered as a useful alternative to the transvenous ICD system when <u>venous access is difficult</u> , after the <u>removal of a transvenous ICD for infections or in young patients with a long-term need for ICD therapy.</u>	IIb	C	This panel of experts

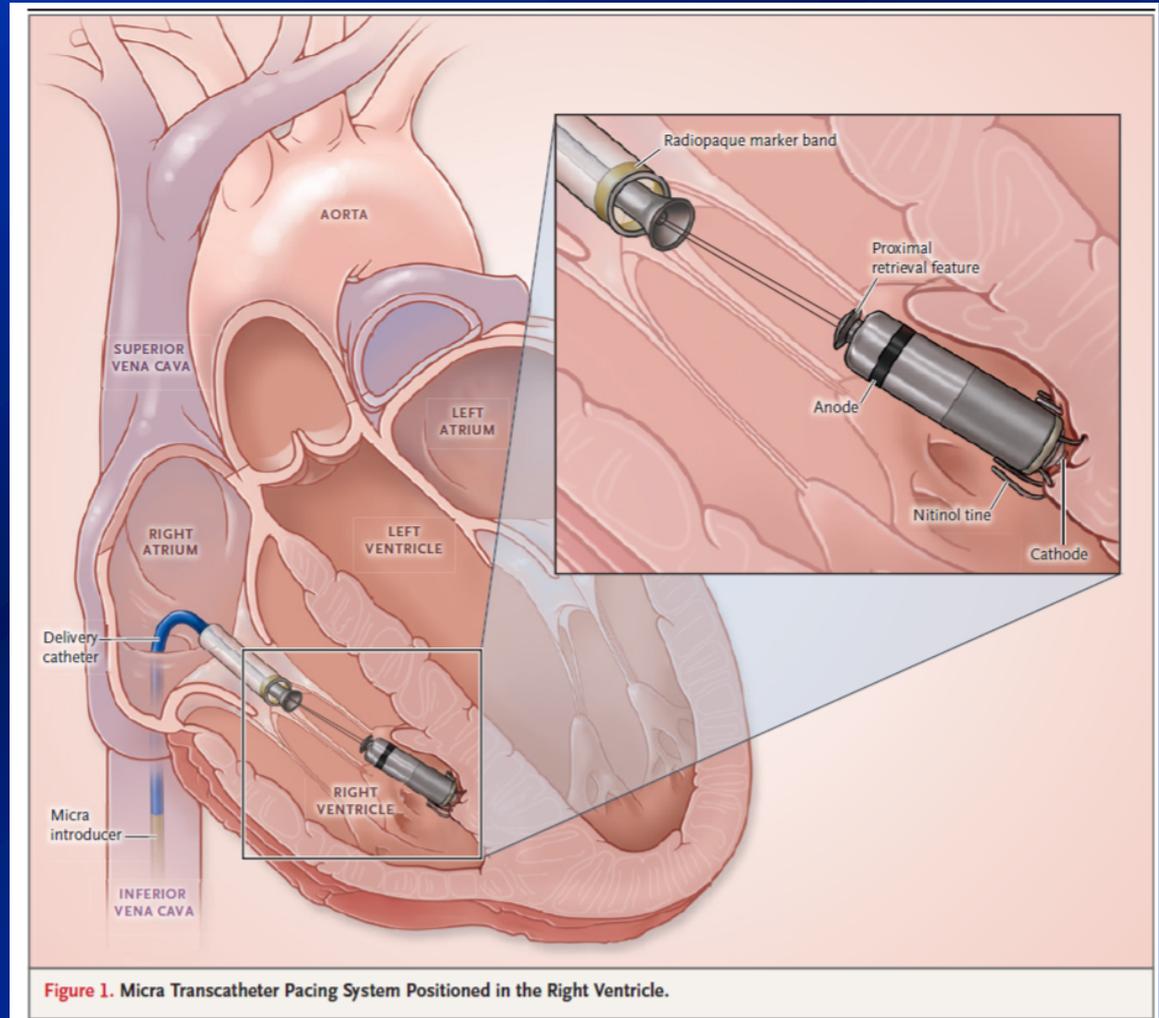
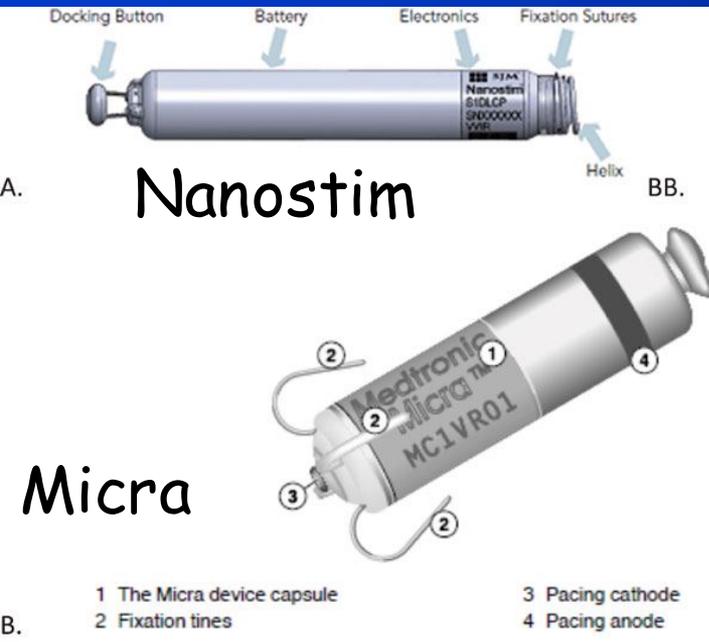
Leadless pacemaker

Pm convenzionali

Complicanza	Incidenza	Conseguenze
Sposizionamento catetere	2.2% - 3.7% ¹	Incremento della soglia di pacing, mancata cattura o sensing
Pneumotorace	1.6% - 2.6% ^{1,2,3,4,5}	Disfunzione respiratoria e ospedalizzazione (80% richiede intubazione)
Perforazione	< 1% ^{1,2}	Tamponamento cardiaco, decesso
Trombosi venosa	1%-3% ^{2,3,4,5}	Normalmente asintomatica
Failure dell'elettrocattetero	2%-4% dei pz 5 anni ^{2,3,4,5}	Mancata cattura o sensing, necessità di reintervento
Ematoma con revisione chirurgica	<0.5% ²	Ricovero prolungato/reintervento, aumento del rischio di infezione
Erosione della tasca (sostituzione dispositivo)	0.8-0.9% ^{2,6}	Necessità di estrazione dell'intero sistema (PM+catetere)
Infezione	< 1% per monocamerale 1% - 2% per bicamerale ^{7,8}	Necessità di estrazione dell'intero sistema per un trattamento efficace

Leadless pacemaker

Il pacemaker VVIR viene introdotto attraverso la vena femorale all'interno del ventricolo destro



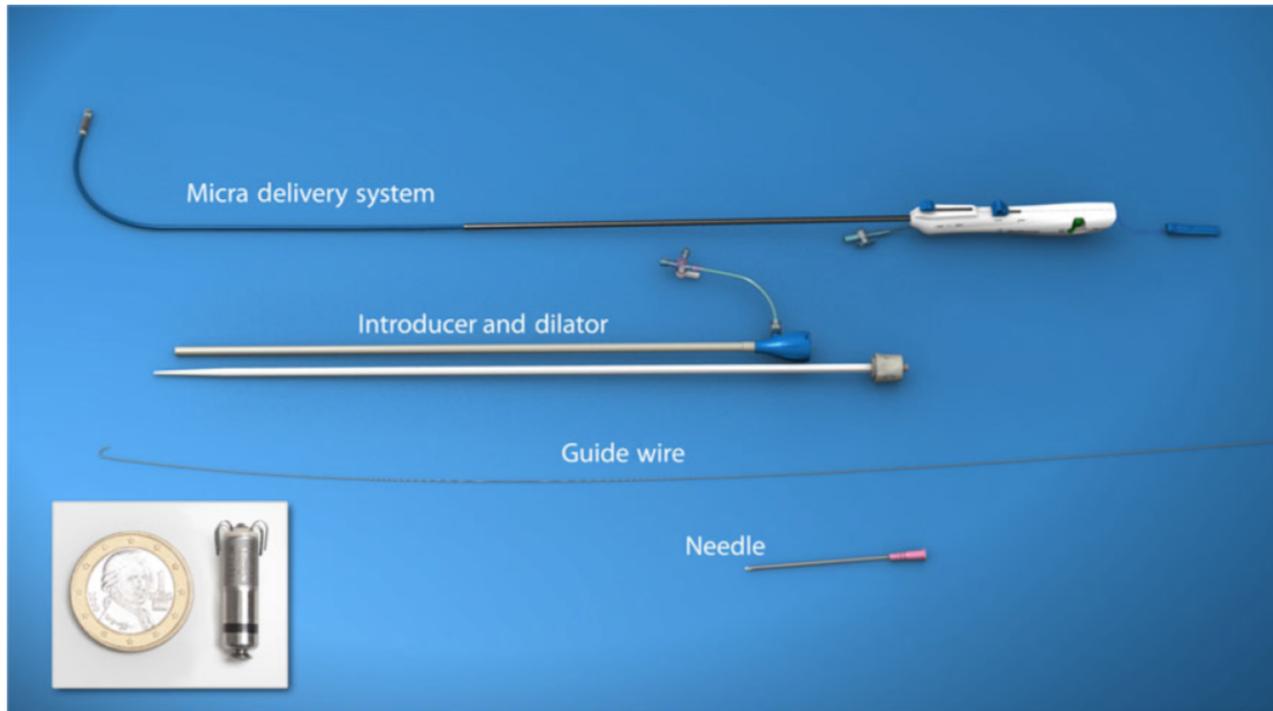


Figure 2 Transcatheter pacing system delivery system. Tools needed to deliver transcatheter pacing system, from bottom to top: needle and guide-wire, introducer with dilator, delivery catheter with transcatheter pacing system retracted within the distal tube of the delivery system. Inset: transcatheter pacing system with Euro dollar to indicate scale.



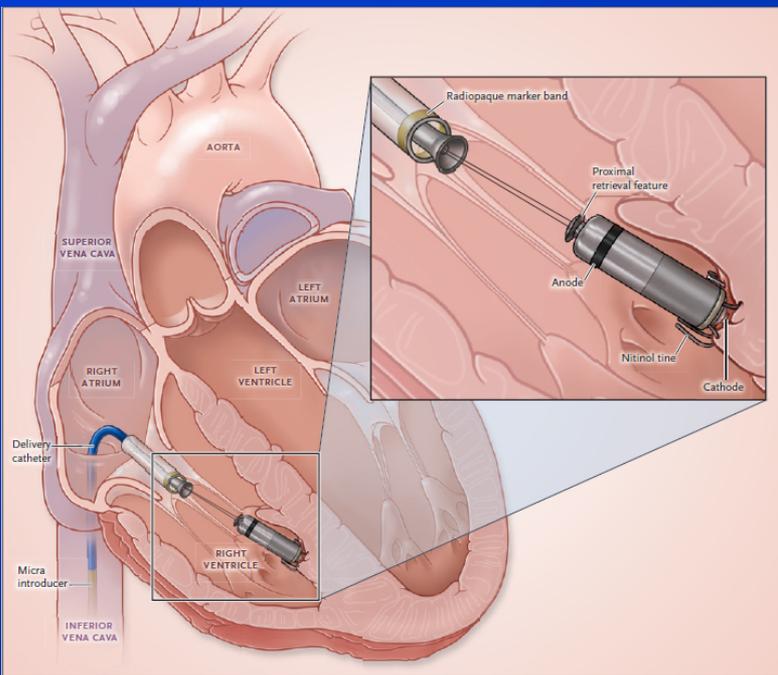


Figure 1. Micra Transcatheter Pacing System Positioned in the Right Ventricle.

\$ Costo 7- 10 vv
PM convenzionale !!!!

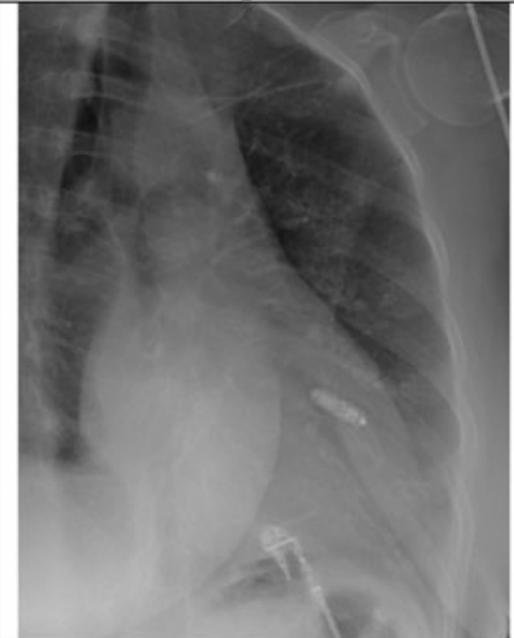
Apical placement



Mid-septal placement



RVOT placement



Negli studi PM LEADLESS indicazioni :

- Fa lenta (64.0%),
- Disfunzione sinusale(17.5%),
- BAV (14.8%),
- altro (3.7%).

Leadless scelto per

- **Età avanzata** (18.2%)
- Richiesta del pz di **nuova tecnologia** (12.3%)
- 6.2% : condizioni che **precludevano** impianto PM tradizionale
 - Sistema venoso compromesso**
 - Necessita di preservare sistema venoso per **emodialisi**
 - Trombosi**
 - Storia di **infezione**
 - Catetere venoso a permanenza

Take home message (I)



I pazienti che sopravvivono ad un **arresto cardiaco** o con TVS affetti da **QUALUNQUE CARDIOPATIA** (organica o genetica) hanno indicazione di **CLASSE I a ICD** (**PREVENZIONE SECONDARIA**)

HF pts on OPT con **FE \leq 35%**, **ISCHEMICI O NON ISCHEMICI**, hanno indicazione di **CLASSE I a ICD** (**PREVENZIONE PRIMARIA**)



EP + HF + Ecocardiografista



Scelta ICD vs CRT-D

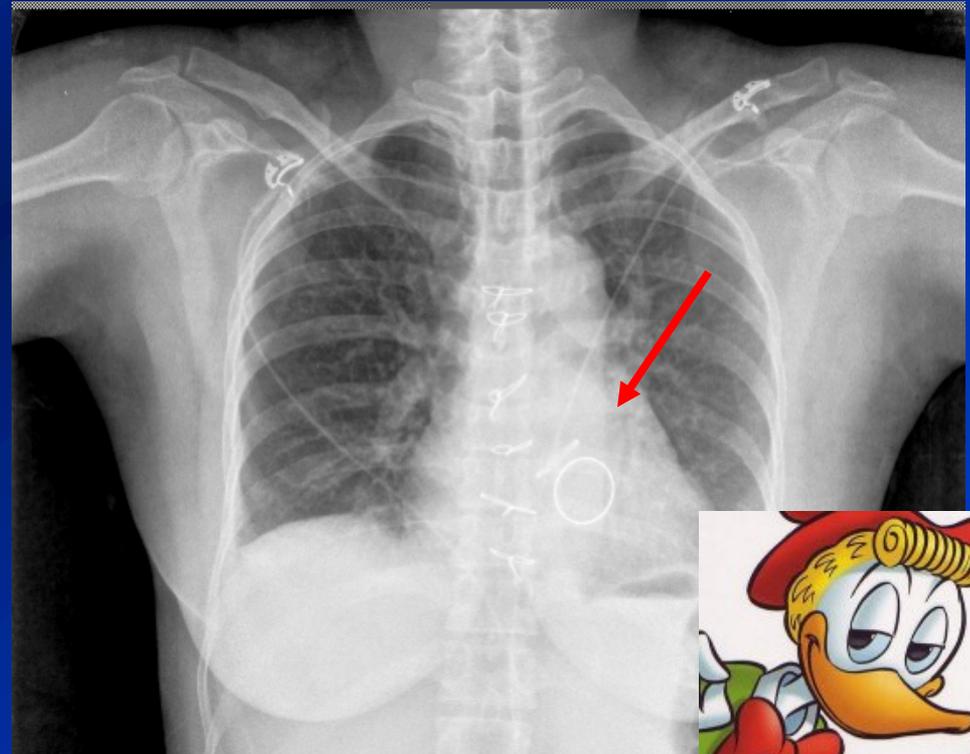
Take home message (II)



Nei pazienti sottoposti ad intervento di cardiocirurgia,
RIVALUTARE FE a 3 mesi dall' intervento



Nonostante il cardiocirurgo ... 😊



Take home message



Nei pazienti sottoposti ad intervento di PTCA + Stent,
RIVALUTARE FE a 3 mesi dall' intervento



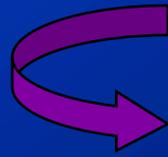
Nonostante l' emodinamista ... 😊



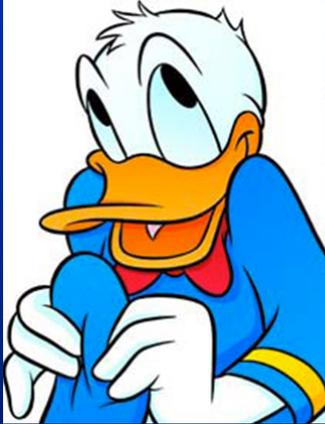
A volte la funzione contrattile resta depressa ($\leq 35\%$)...



Il paziente resta a rischio di morte improvvisa...



Con indicazione a ICD/CRT-D



Povero elettrofisiologo...

E povero paziente... che deve mettere ..."la macchinetta"



*Milano: Dalla sala di attesa Humanitas
AMBULATORI CONTROLLI PM/ICD
discorso fra due pazienti*

*Mi gh'avevi su i transistors
(trad. extrasistoli) e m'han mis su el
black & decker (trad. defibrillatore)*



GRAZIE

