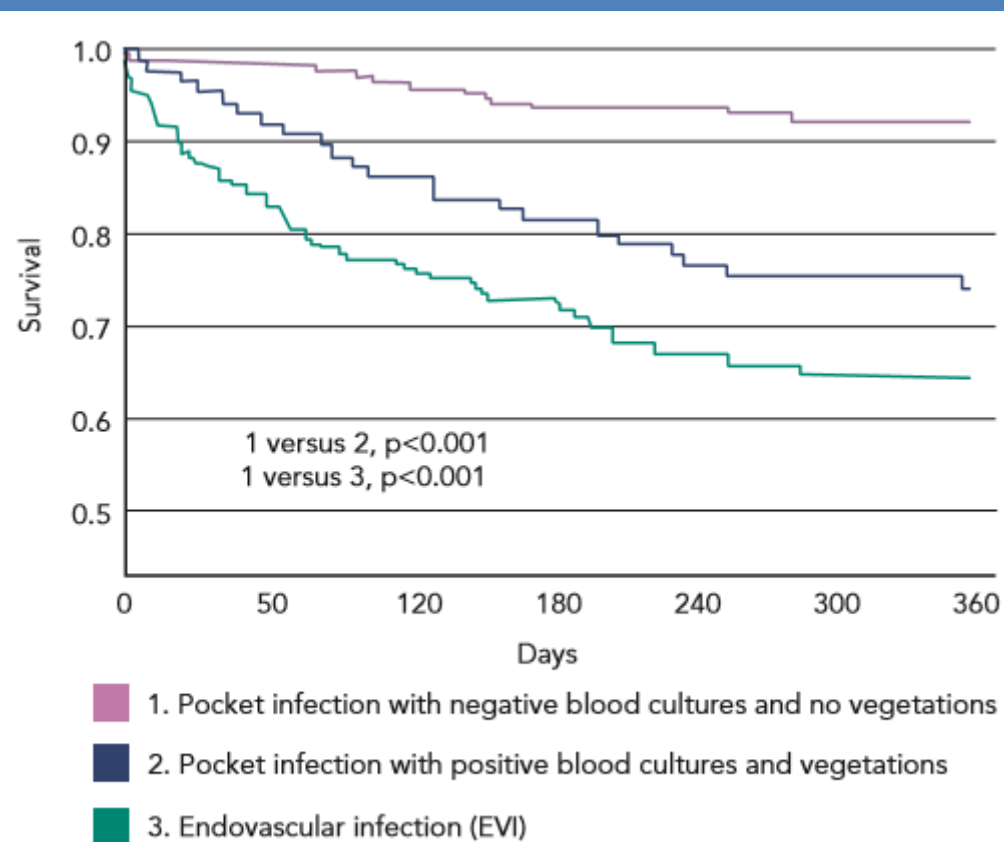


**Quali precauzioni e comportamenti
per ridurre il rischio oltre la
profilassi antibiotica**

Dr. L. Rossi
G.da Saliceto - Piacenza



Source: Tarakji, 2010.²⁵

Tarakji KG et al. Heart Rhythm 2010;7:1043–7.

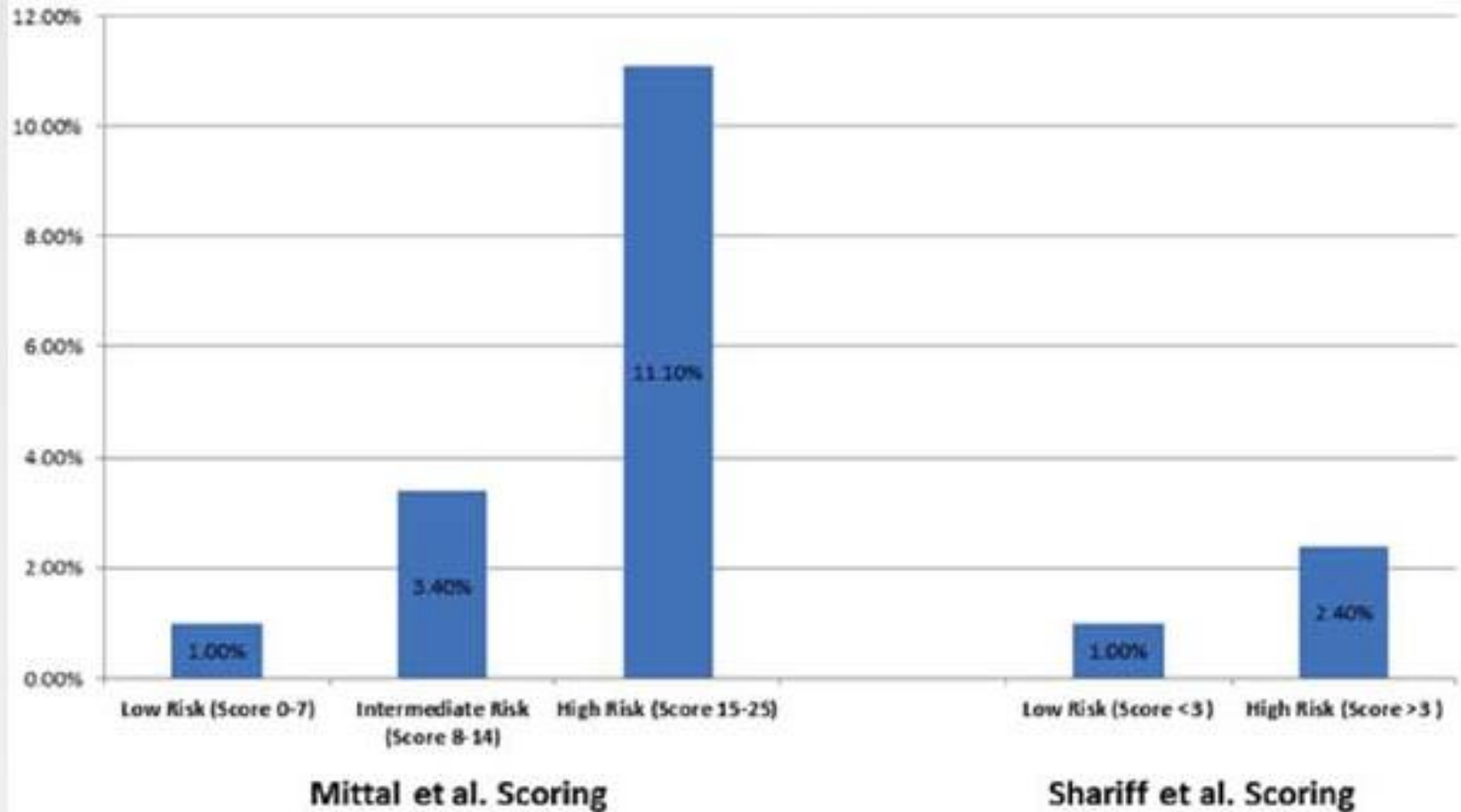
1. Identificare pazienti ad elevato rischio

Cardiovascular Implantable Electronic Device Infections: Risk Scoring and Role of Antibiotic Envelope in Prevention

Nasir Shariff^{a*}, Tauseef Akthar^b, Eathar Razak^a, Nathan Segerson^c and David Schwartzman^d

	Clinical Characteristic Point Score (weightage for factor)
Mittal S et al. Heart Rhythm 2014; 11(4): 595- 601.	Early Pocket Re-exploration (11) Male Gender (6) Diabetes (3) Device Upgrade (2) Congestive Heart Failure (1) Hypertension (1) GFR < 60 ml/min (1)
Shariff N, et al. J Cardiovasc Electrophysiol 2015; 26(7): 783-9.	Diabetes Mellitus (1) Congestive heart failure (1) Oral anticoagulation use (1) Corticosteroid use (1) Renal impairment (1) Prior CIED infection (1) More than 2 leads (1) Epicardial lead (1) Temporary pacer placement (1) Generator change/upgrade (1)

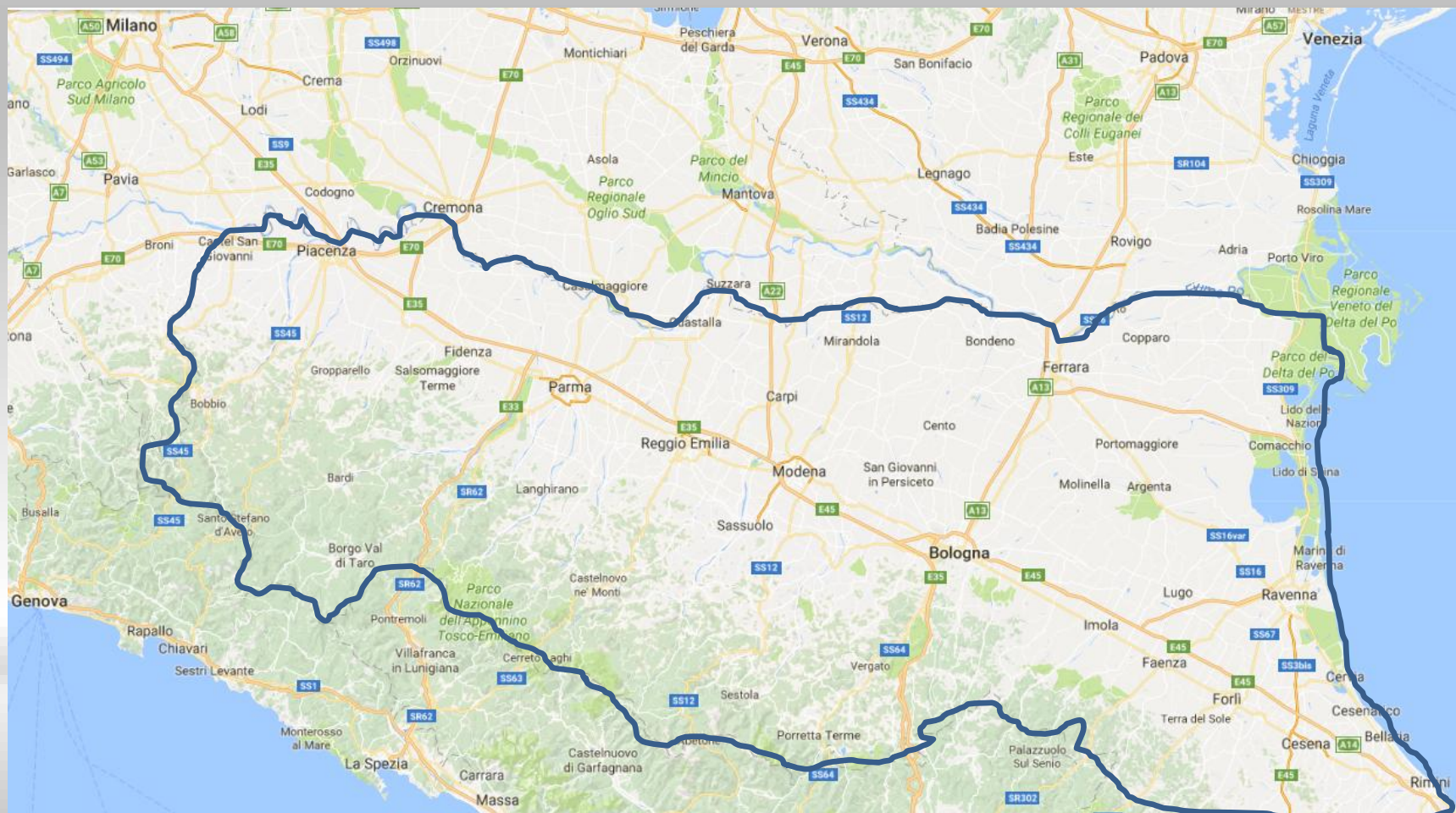
Infection Rates



PROCEDURE	Odds Ratio
Reintervento precoce (entro 2 mesi da impianto)	15.04
CRT-D/CRT-P vs ICD	7.57
Almeno 2 elettrodi abbandonati	5.41
Sostituzione device /revisione	3.67
Pace maker temporaneo in atto	2.46
FARMACI PAZIENTE	
Corticosteroidi (tp cronica)	13.90
Anticoagulanti orali (tp cronica)	2.82
CARATTERISTICHE PAZIENTE	
Insufficienza Renale in Dialisi*	13.39
Disfunzione Renale Severa (eGFR < 30 ml/min)*	11.97
Disfunzione Renale Moderata (eGFR 30-59 ml/min)*	5.46
Diabete in trattamento farmacologico	3.50
Scompenso cardiaco NYHA ≥3	2.57
Genere Maschile	2.23



Study	Study Type	Number of Patients	Selection Criteria	Results
COMMAND Trial [20]	Retrospective cohort study	Envelope 624 and no control group	Inclusion: Consecutive CIED implants with utilization of antibacterial envelope Exclusion: Prior CIED infections, Off label use of antibiotic Envelope	0.48% infection rate during the 2 month follow-up
Kolek <i>et al.</i> [23]	Retrospective cohort study	Envelope 260 and Controls without envelope 639	Inclusion: Patients aged ≥ 18 yrs with ≥ 2 of following risk factors DM, renal insufficiency, chronic steroid use, anticoagulation, Fever or leucocytosis at the time of implantation, prior device infection, ≥ 3 leads, early pocket reentry, device revision	Infection rate in envelope group was 0.4% and non-envelope group was 3% at follow up of 3 months.
Mittal <i>et al.</i> [13]	Retrospective cohort study	Pre-envelope era 1651, Envelope era 1240 (275 received envelope)	Inclusion: Consecutive CIED procedure. Two cohorts based on the time of implantation. Pre antibiotic era from Jan 2007 to October 2009 and antibiotic era from November 2009 to September 2011. Use of envelope at the discretion of implanting surgeons for patients deemed high risk	1.1% infection in the envelope patients as compared to 3.6% in matched non-envelope patients during 6 months follow up. 79 % reduction in medium risk patients (risk score 8-14)
Shariff <i>et al.</i> [14]	Retrospective cohort study	Envelope 365 and Control without envelope 1111	All CIED implantations during the study period were included in the study. Some implanters used envelope on all procedures, while some implanters did not use envelope.	19 (1.7%) infections in non-envelope group and none in envelope group during 6 months follow up. Financial benefit of \$23,863 per 365 patients on use of antibiotic envelope during all CIED implants
Kolek <i>et al.</i> [24]	Retrospective cohort study	135 absorbable envelope, 353 non-absorbable envelope and 636 no envelope.	Patients with bio-absorbable antibacterial envelope were studied in reduction of infection in high-risk patients.	At 300 days, the infections were 0 (0%) in the absorbable envelope, 1 (0.3%) in the non-absorbable envelope, and 20 (3.1%) in the non-envelope group.
Citadel and Centurion [25]	Prospective cohort study	Envelope 1129 and no control group	Inclusion: Pts undergoing CIED procedures including ICD, CRT-D and CRT-P at multiple centers. Exclusion: Ineligible procedure, informed consent and device.	73% to 90% reduction in infections based on the preliminary results at 12 months of follow up



2. Ottimizzare la procedura chirurgica

Arrhythmia/Electrophysiology

Risk Factors Related to Infections of Implanted Pacemakers and Cardioverter-Defibrillators

Results of a Large Prospective Study

Didier Klug, MD, PhD; Mamadou Balde, MD; Dominique Pavin, MD; Françoise Hidden-Lucet, MD;
Jacques Clementy, MD; Nicolas Sadoul, MD; Jean Luc Rey, MD; Gilles Lande, MD;
Arnaud Lazarus, MD; Jacques Victor, MD; Claude Barnay, MD; Bruno Grandbastien, MD;
Salem Kacet, MD; for the PEOPLE Study Group

	Percent of Overall Population	Variable*		Analysis					
		Present	Absent	Single Variable			Multiple Variable†		
				OR	95% CI	P	aOR	95% CI	P
Age, mean, y	76	...	...	...	...	0.14	...	...	0.79
Female sex	40.3	0.57	0.77	0.74	0.39–1.40	0.35	...	...	...
Diabetes mellitus	10.1	0.81	0.67	1.21	0.48–3.06	0.61	...	...	...
Immunosuppression	2.4	2.0	0.65	3.07	0.96–9.82	0.08	...	...	0.29
Antiplatelet therapies	17.2	0.66	0.69	0.96	0.43–2.16	0.93	...	...	...
Oral anticoagulant	11.3	0.57	0.70	0.81	0.29–2.27	1	...	...	...
Heparin	18.3	1.06	0.60	1.77	0.91–3.45	0.09	...	...	0.40
Fever 24 h before implant	1.6	5.32	0.61	8.68	3.49–21.6	<10 ⁻³	5.83	2.00–16.98	<10 ⁻²
Infection at another site	3.8	1.70	0.64	2.64	0.95–7.34	0.08	...	...	0.53
Cutaneous lesions	2.6	1.89	0.65	2.89	0.90–9.26	0.09	2.38	0.68–8.27	0.17
Temporary pacing wire	8.8	1.69	0.59	3.58	1.48–8.65	<10 ⁻²	2.46	1.09–5.13	<10 ⁻²
De novo implantation	70.3	0.56	0.99	0.56	0.30–1.02	0.06	0.46	0.24–0.87	0.02
PM/ICD	92.8	0.45	0.70	1.56	0.38–6.42	0.77	...	...	0.79
Dual-chamber system	62.8	0.75	0.51	1.44	0.70–2.96	0.32	...	...	...
Biventricular system	1.8	1.77		3.35	0.74–15.13	0.14	...	...	0.45
Local anesthesia	88.5	0.72	0.43	1.69	0.52–5.44	0.62	...	...	...
Ipsilateral intravenous infusion	17.3	0.66	0.69	0.96	0.43–2.15	0.92	...	...	...
Vein puncture	61.7	0.57	0.54	0.80	0.30–2.15	0.65	...	...	...
Procedure duration, min	45	...	...	...	...	0.56	...	...	0.37
>3 Persons in the operating room	27.9	0.93	0.58	1.61	0.87–2.97	0.13	1.49	0.78–2.84	0.23
No wound drain	87.1	0.71	0.56	2.97	0.41–21.59	0.36	...	...	...
Antibiotic prophylaxis	88.3	0.61	1.27	0.48	0.23–0.99	0.05	0.40	0.18–0.86	0.02
Center <100 implantations/y	17.6	0.56	0.71	0.79	0.33–1.87	0.59	...	...	...
Less-experienced operator	9.7	1.01	0.65	1.55	0.66–3.67	0.29	...	...	0.39
Hematoma	5.3	1.23	0.65	1.88	0.68–5.24	0.28	...	...	0.89
Postprocedural fever	2.4	2.01	0.66	3.05	0.95–9.75	0.08	...	...	0.67
Early reintervention	1.7	8.91	0.55	16.29	8.01–33.15	<10 ⁻⁷	15.04	6.70–33.73	<10 ⁻⁴





ORIGINAL ARTICLE

Chlorhexidine–Alcohol versus Povidone–Iodine for Surgical-Site Antisepsis

Rabih O. Darouiche, M.D., Matthew J. Wall, Jr., M.D., Kamal M.F. Itani, M.D., Mary F. Otterson, M.D., Alexandra L. Webb, M.D., Matthew M. Carrick, M.D., Harold J. Miller, M.D., Samir S. Awad, M.D., Cynthia T. Crosby, B.S., Michael C. Mosier, Ph.D., Atef AlSharif, M.D., and David H. Berger, M.D.

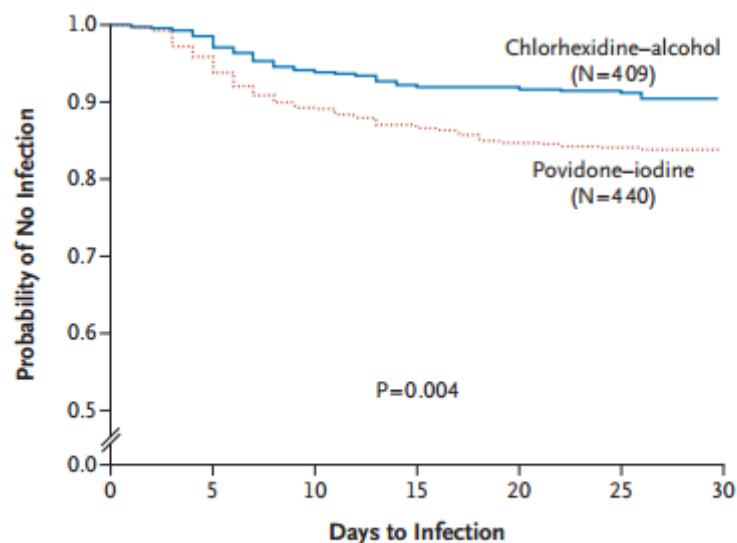


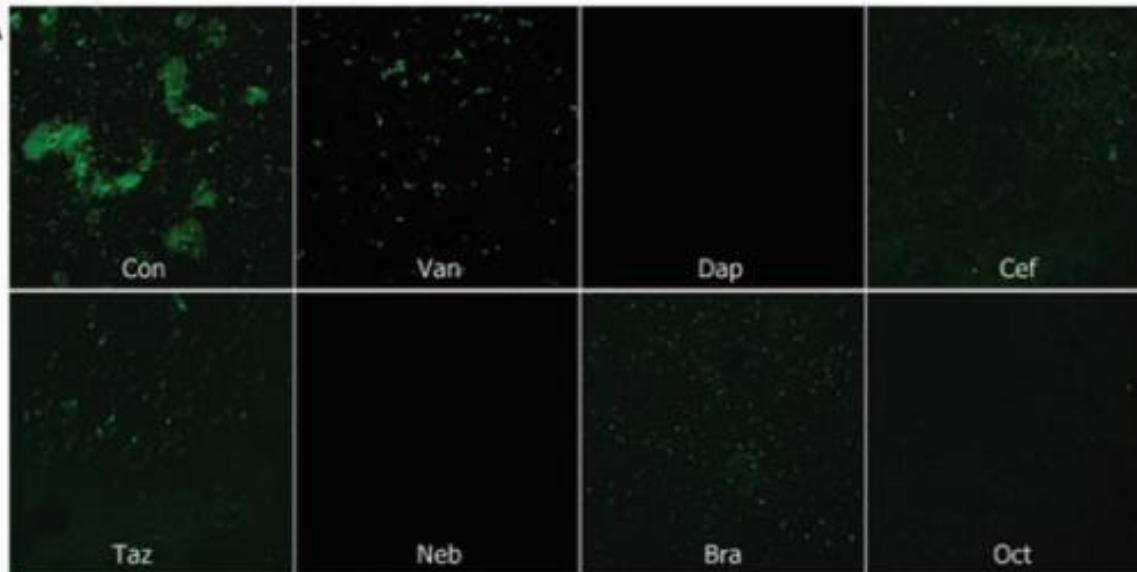
Figure 2. Kaplan–Meier Curves for Freedom from Surgical-Site Infection (Intention-to-Treat Population).

Darouiche R et al. N Engl J Med 2010; 362:18-26

I. Impregnation

Immersion for 20 min

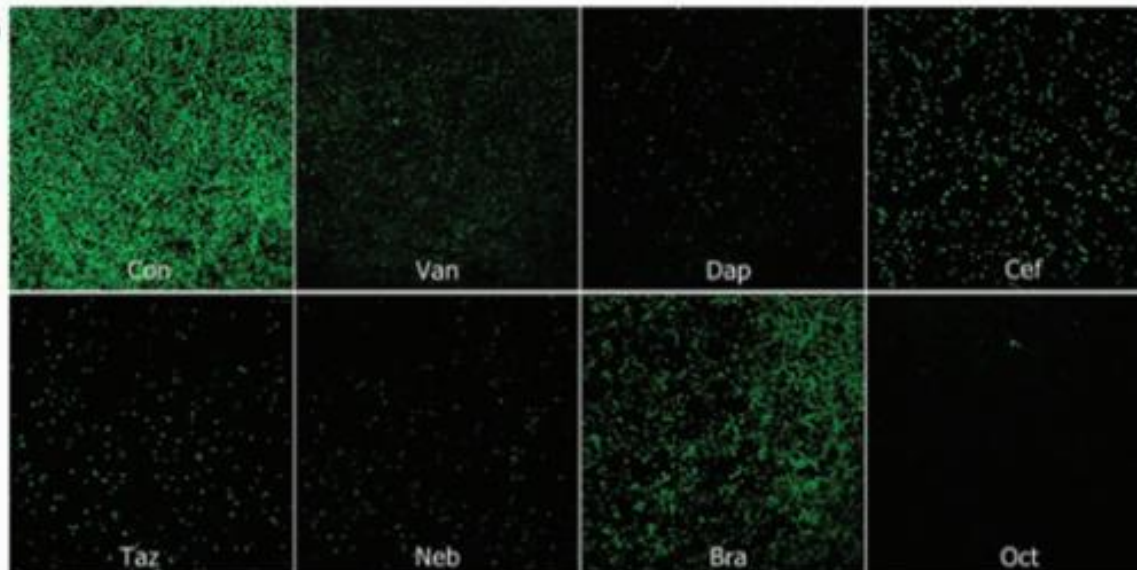
Control
 $n = 12$



Octenisept
 $n = 12$

II. Microbiological

Incubation with bac



III. Cytotoxicity to

Coculture with huma





AMERICAN COLLEGE OF SURGEONS

Committee on Control of Surgical Infections
of the Committee on Pre- and Postoperative Care

MANUAL ON

Control of Infection in Surgical Patients

SECOND EDITION

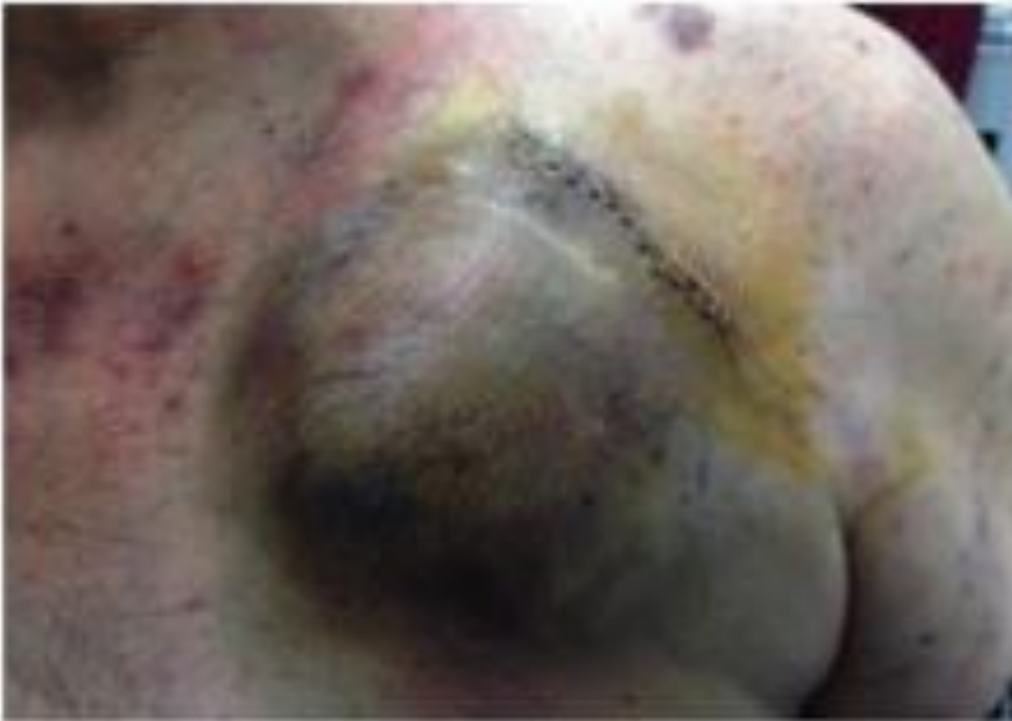
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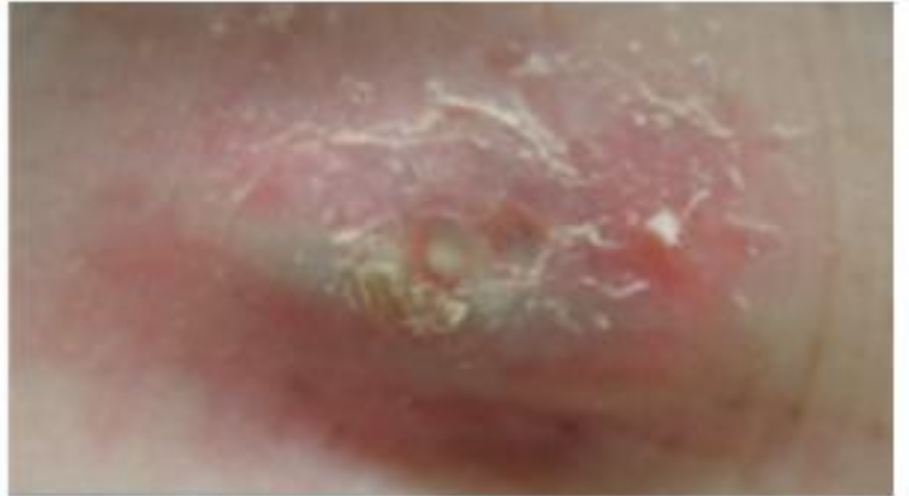


- Accurata emostasi
- No bridge con eparina
- Sospensione TAO basso rischio tromboembolico
- Sospensione NAO 24 ore pre procedura

AREA SUPERFICIE	$40 \text{ m}^2 \leq \text{SUPERFICIE} \leq 70 \text{ m}^2$
CARATTERISTICHE PER: - PAVIMENTI - SUPERFICI - PARETI	› Devono essere rivestiti con materiali: ○ lavabili; ○ resistenti all'usura; ○ non riflettenti la luce. › devono avere superfici lisce; › non devono presentare: ○ fessure; ○ sporgenze; ○ angoli acuti che ostacolino un accurato lavaggio e disinfezione.



3. Evitare l'intervento chirurgico



Device Longevity in a Contemporary Cohort of ICD/CRT-D Patients Undergoing Device Replacement

FRANCESCO ZANON, M.D., F.E.S.C., F.H.R.S.,* CRISTIAN MARTIGNANI, M.D.,†
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M.D.,** GIUSEPPE STABILE, M.D.,†† DOMENICO ROSARIO POTENZA, M.D.,‡‡
GIANNI PASTORE, M.D.,* MATTEO IORI, M.D.,§§ CONCETTO LA ROSA, M.D.,¶¶ and
MAURO BIFFI, M.D.†

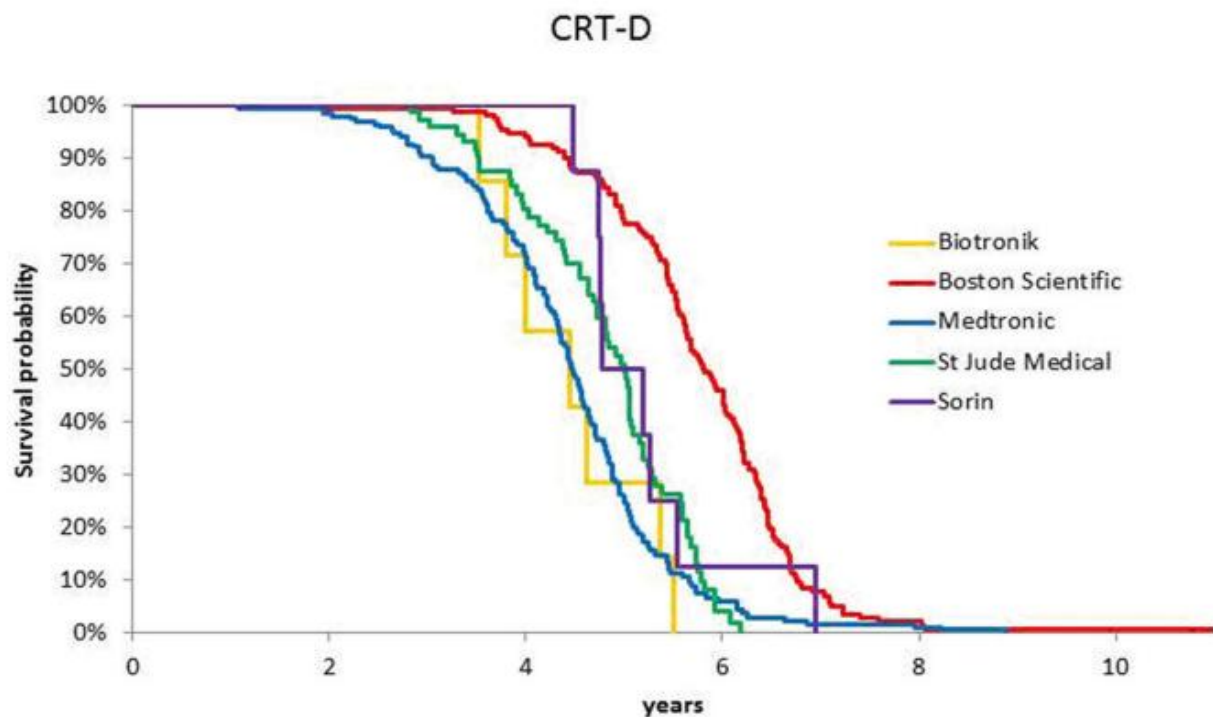


Table 2 Factors associated with battery drain, measured as the year-to-year decrease in residual battery capacity (mAh)

	CRT-D			ICD-DR			ICD-VR		
	Coefficient	SE	P	Coefficient	SE	P	Coefficient	SE	P
Year	48.06	1.75	<0.001	8.37	1.09	<0.001	6.56	0.73	<0.001
Right ventricular amplitude, V	-2.36	2.75	0.392	1.36	1.83	0.456	0.35	0.84	0.678
Right ventricular width, ms	19.64	7.80	0.012	1.54	4.87	0.752	3.10	3.61	0.391
Right ventricular impedance, Ohm	-	-	-	-	-	-	-	-	-
Left ventricular amplitude, V	11.80	1.41	<0.001	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Left ventricular width, ms	20.57	3.10	<0.001	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Left ventricular impedance, Ohm	-	-	-	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Right atrial amplitude, V	-3.22	2.70	0.234	-1.10	1.85	0.553	n.a.	n.a.	n.a.
Right atrial width, ms	8.42	7.18	0.241	22.62	5.99	<0.001	n.a.	n.a.	n.a.
Right atrial impedance, Ohm	-	-	-	-	-	-	n.a.	n.a.	n.a.
Ventricular pacing, %	0.20	0.07	0.004	0.17	0.04	<0.001	0.00	0.07	0.981
Atrial pacing, %	0.09	0.07	0.222	0.11	0.03	<0.001	n.a.	n.a.	n.a.
Rate response mode, ON	1.96	3.90	0.616	4.05	1.99	0.042	-0.02	5.92	0.997
Heart rate, bpm	0.35	0.14	0.017	0.27	0.09	0.002	0.04	0.05	0.469
Shock delivered, <i>n</i>	2.65	0.34	<0.001	2.34	0.30	<0.001	2.54	0.16	<0.001
Shock diverted, <i>n</i>	1.74	0.84	0.039	1.02	0.35	0.004	0.86	0.31	0.006

