

# PREDICTED LONGEVITY OF CONTEMPORARY CARDIAC IMPLANTABLE ELECTRONIC DEVICES

## A Call for Industry-wide “Standardized” Reporting

Munawar, Dian A. et al. Heart Rhythm 2018

### OBJECTIVE & METHOD

Prospective comparison of the predicted longevity of current generation CIEDs.

Data were extracted from product manuals and, where absent, were obtained by communication with the manufacturers.

#### High voltage devices included

Biotronik - Iperia 7  
Boston Sc. - Autogen EL / X4  
MicroPort CRM - Platinum  
Medtronic - Evera / Viva®  
Abbott - Fortify / Quadra Assura.

### INTRODUCTION

#### Why cardiac device longevity matters?

- Device longevity has been shown to have the largest impact on cost-effectiveness of primary prevention ICD therapy.
- Extending device longevity from 5 to 9 years for ICDs and 4 to 7 years for CRT-Ds is associated with a 29% to 34% annual cost saving over a time horizon of 15 years.
- The mismatch between patient survival and device longevity of ICDs leads to an increased probability of generator change that confers up to a 4-fold increased risk of infection and up to a 5-fold increased risk of lead complications.

### KEY RESULTS

- The mean maximum predicted longevity of ICDs and CRT-Ds was 12.4 and 8.8 years, respectively, under monitoring conditions.
- Difference between manufacturers in predicted longevity: 7.7 years for ICDs (VR; 0% pacing; capacitor reforms only; features on) and & capacitor reforms only; features on) respectively.

### DISCUSSION

#### Factors impacting device longevity

- If longevity was a key priority, selecting the appropriate device brand would yield much larger net gains in longevity than device programming.

Battery capacity and housekeeping current are the most important factors that determine CIED longevity.

Taken together, gains in device longevity can be obtained via activating features like autothreshold or those that reduce unnecessary pacing or, conversely, via deactivating energy draining algorithms.

Gain in device longevity is estimated to be up to 1 year by following algorithms or best practice: auto-capture, reduction of pacing margin, algorithms reducing RV pacing.

Of note, some algorithms that aim to optimize CRT response have been found to shorten battery longevity by up to 1.2 years.

Each maximal energy shock is estimated to reduce longevity by roughly 1 month.

A Call for Standardized Reporting by CIED Manufacturers

**“ THE USAGE OF DIFFERENT SETTINGS FOR DERIVING PREDICTED LONGEVITY HAS BEEN A SIGNIFICANT IMPEDIMENT FOR PAYERS, INSURERS, PATIENTS AND PHYSICIANS TO GAIN A FAIR ASSESSMENT OF THE DIFFERENCES BETWEEN BRANDS AND MODELS. INDEED, AN INDUSTRY-WIDE STANDARDIZED REPORTING IN PREDICTED LONGEVITY FOR ALL CIED PRODUCTS IS LONG OVERDUE.”**

### CONCLUSION

In contemporary CIEDs, predicted device longevity remains highly variable among the different manufacturers.

CIED longevity remains an important factor that can impact on health care costs as well as clinical outcomes in the settings of future need for generator replacements. Industry-wide standardized reporting of predicted CIED longevity is urgently required.

#### — COMPARISON SUMMARY —

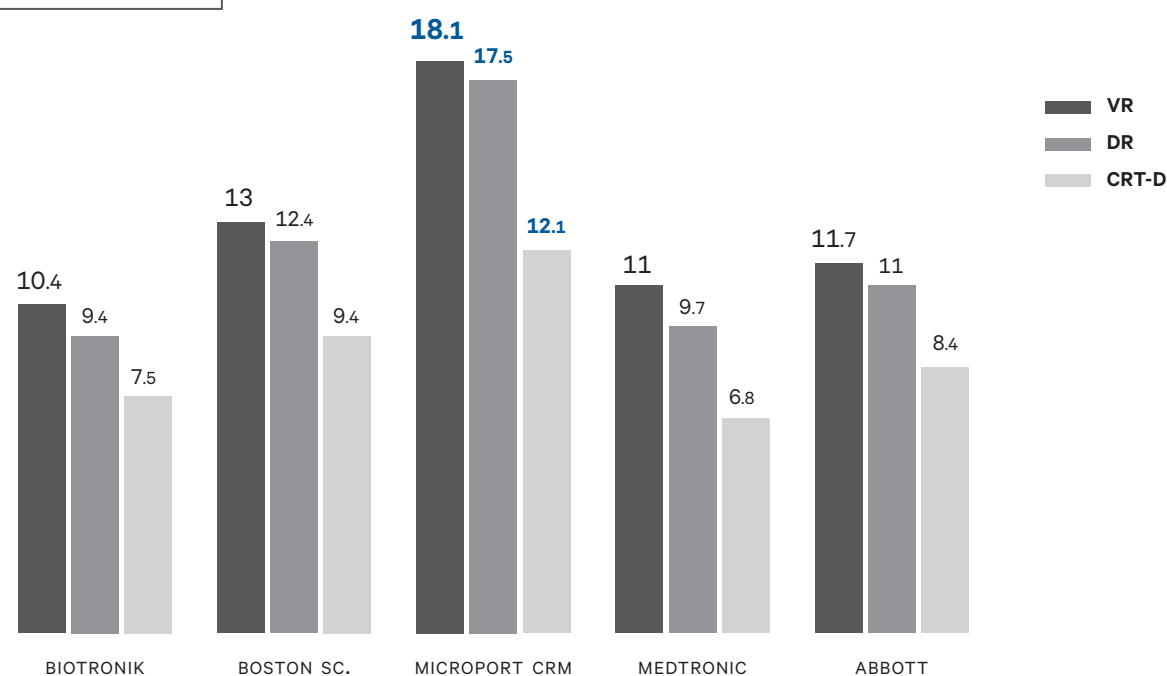
		BIOTRONIK	BOSTON SC.	MICROPORT CRM	MEDTRONIC	ABBOTT	
AVERAGE BACK CALCULATED CURRENT DRAIN (µA)		18.4	18.3	11.4	13.0	15.4	
MEAN USABLE BATTERY CAPACITY (Ah)		1.5	1.8	1.5	1.0	1.4	
LONGEVITY (years)	VR	0% pacing (Monitoring)	10.4	13.0	18.1	11.0	11.7
		15% pacing	10.1	12.7	17.5	10.7	11.4
	DR	0% pacing (Monitoring)	9.4	12.4	17.5	9.7	11
		15% pacing	9.0	11.9	16.5	9.1	10.5
	CRT	15% A 100% BiV	7.5	9.4	12.1	6.8	8.4
		Auto-BiV optim.	NA	NA	SonR™ 11.0	AdaptivCRT™ 100% RV/50% LV 7.3	MultiPoint™ 100% BiV MPP 7.2

Conditions: 60 bpm, 2.5V, 0.40ms; 500Ω, no clinical shocks, essential capacitor reforms only, rate response, sensor OFF, RF remote communication and home monitoring ON.

# WHAT DO THEY SAY ABOUT PLATINIUM?

- ✓ **Excels** in terms of predicted longevity by up to 8 years compared to devices from other manufacturers.
- ✓ **Large** usable capacity.
- ✓ **Lowest** current drain.
- ✓ **Greatest safety margin** between RRT & EOS.

LONGEVITY PRESENTED IN THE ARTICLE (YEARS)



## MICROPORT CRM

- ✓ MicroPort CRM offers ICD and CRT-D devices with the **greatest longevity** by combining a large usable battery capacity and the lowest housekeeping current drain.
- ✓ Thanks to Platinum your patients are protected from early replacements.

For more information, visit  
[www.cardiacdevicelongevity.com](http://www.cardiacdevicelongevity.com)