

Clinical Impact of a Universal Remote Monitoring Platform For ICD And CRT-D Follow-up from a Large Real-world Registry

Late-Breaking Clinical Trial Updates and Registries

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Disclaimer



Research/ Consultant/ Speaking for:

- Abbott
- Biotronik
- Medtronic
- Boston Scientific
- Implicity
- Pacemate
- Biosense

Objectives



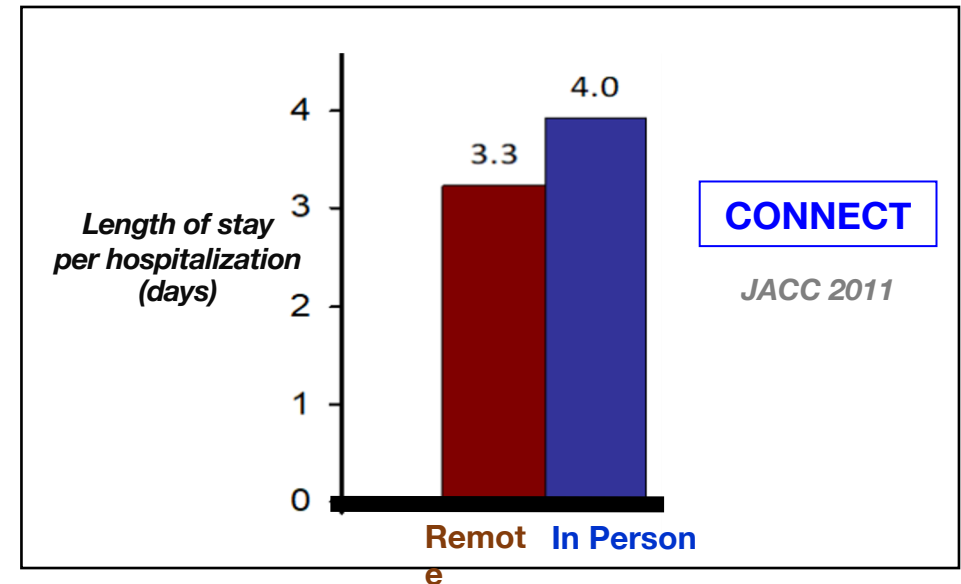
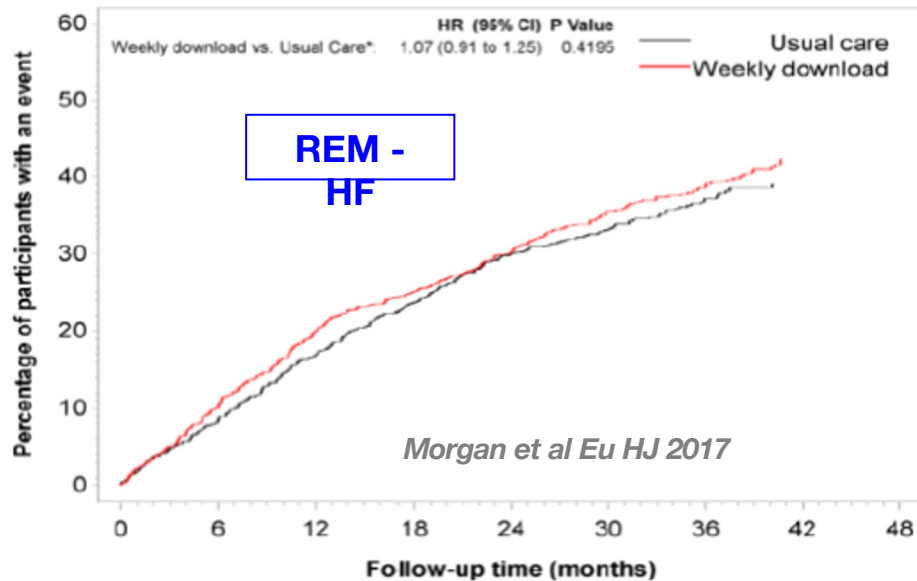
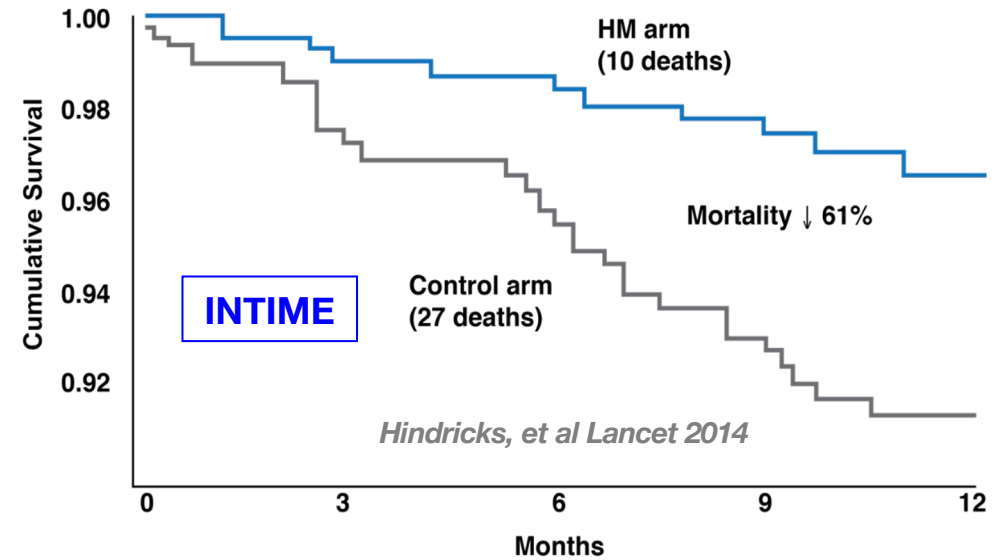
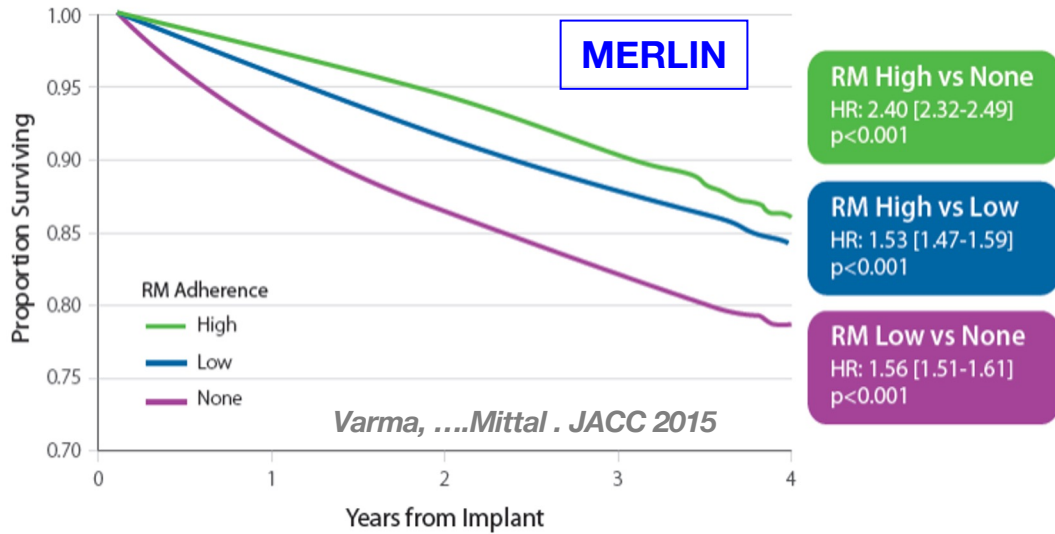
1. Effect of Remote monitoring (RM) of CIED on patient outcome

Are past results confirmed in a real-world large cohort?

2. Facilitation of RM clinic workflow and patient outcome

Does a third party tool have the potential to improve patient outcome?

Context – Past results of RM on Survival



Implicit Universal Remote Monitoring Platform



Third party platform

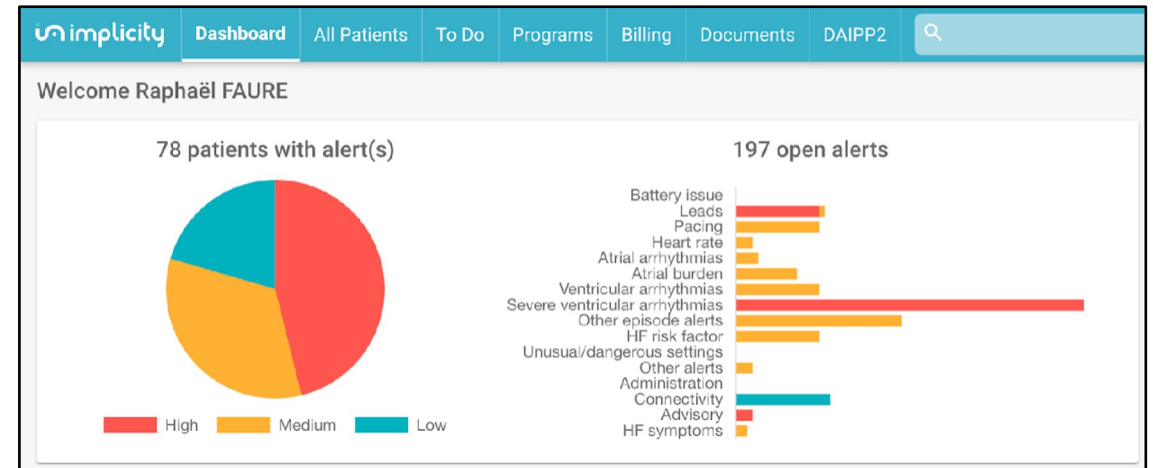
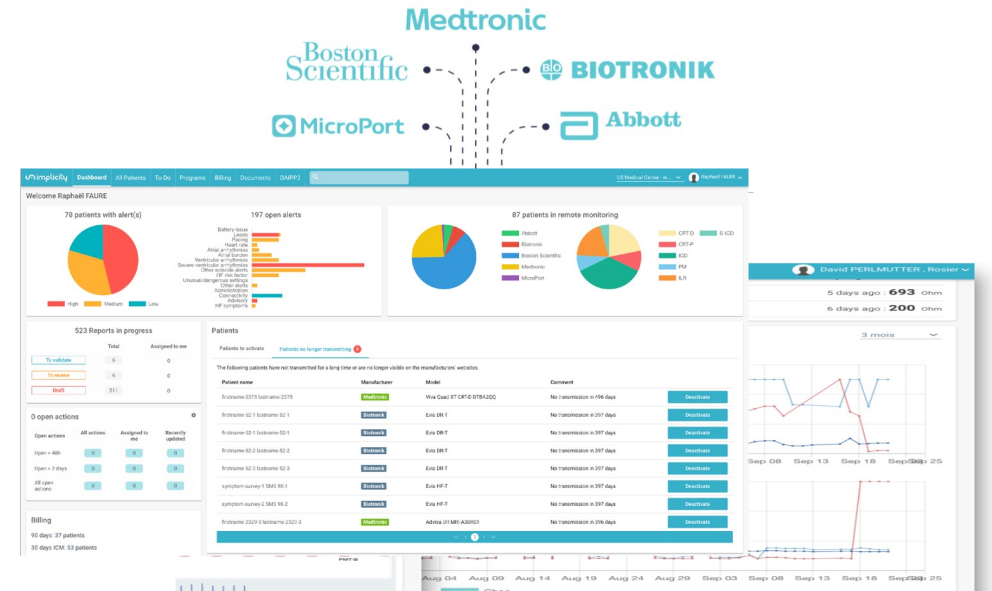
- Compatible with all CIEDs
- = single source of data (alerts and raw data points)

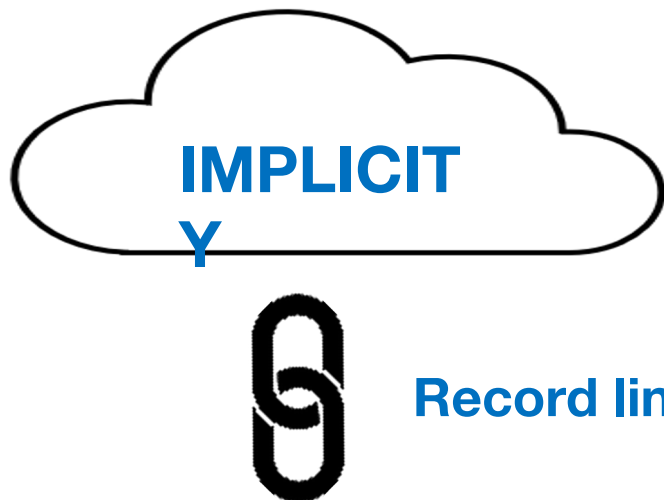
Collect and normalize alerts and data from all vendors

- Customize and prioritize displayed data / alert
- Facilitate collection, interpretation and notification
- Automated reporting and billing claims

Alert based model

- Vendor specific alerts harmonized





- Sex
- Age
- Implantation
- CIED-related Procedures

French Registry Dataset



Nationwide claim-based dataset available for research

Includes:

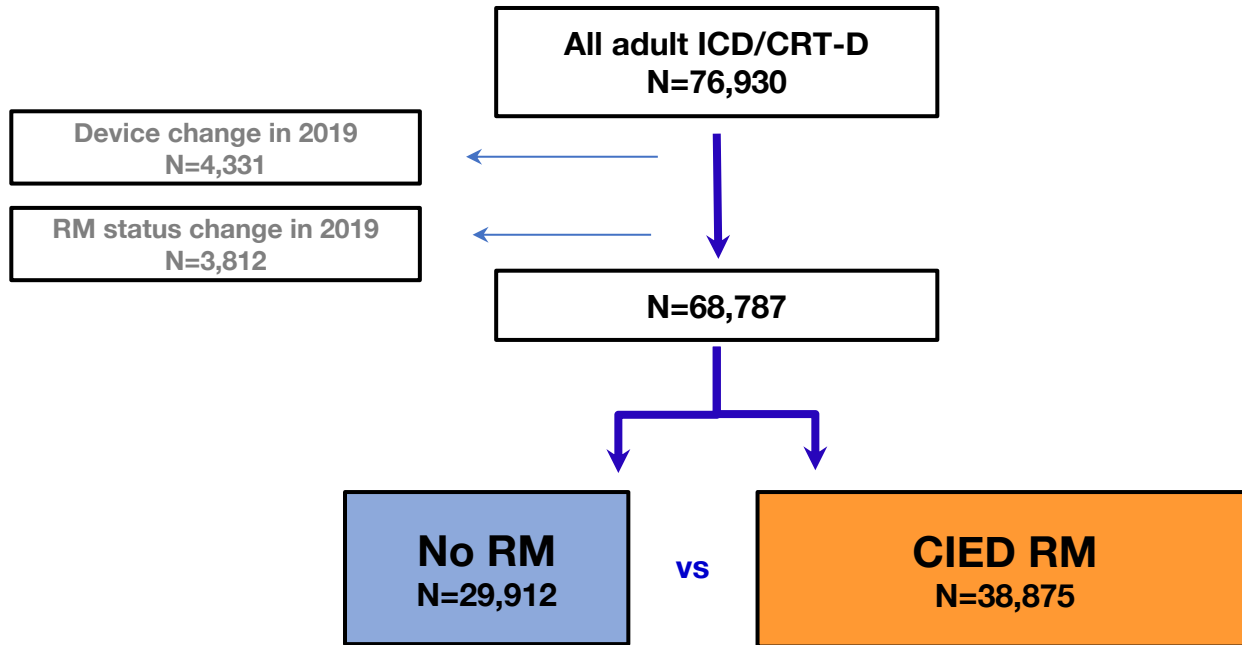
- **All hospitalisations with patient comorbidities (ICD10)**
- All medico-administrative procedures
- In and outpatients / medication purchased
- Patients' death dates

**3.8 million patients with
CIED or HF history**



**Identify all 76,930 ICD/CRT-D adult patients (including Implicity patients),
their death dates and hospitalizations**

Study Design



Statistical Analyses

Doubly robust method combining inverse propensity weighting and regression modelling

Correction for covariates included :

- Age, Gender
- Device type (ICD vs CRT-D),
- Time since implant (years)
- Center volume of RM patients

Analyses

1. All cause mortality,
2. All cause and HF hospitalizations (number and cumulated duration)

Population Demographics & Correction Co-variates

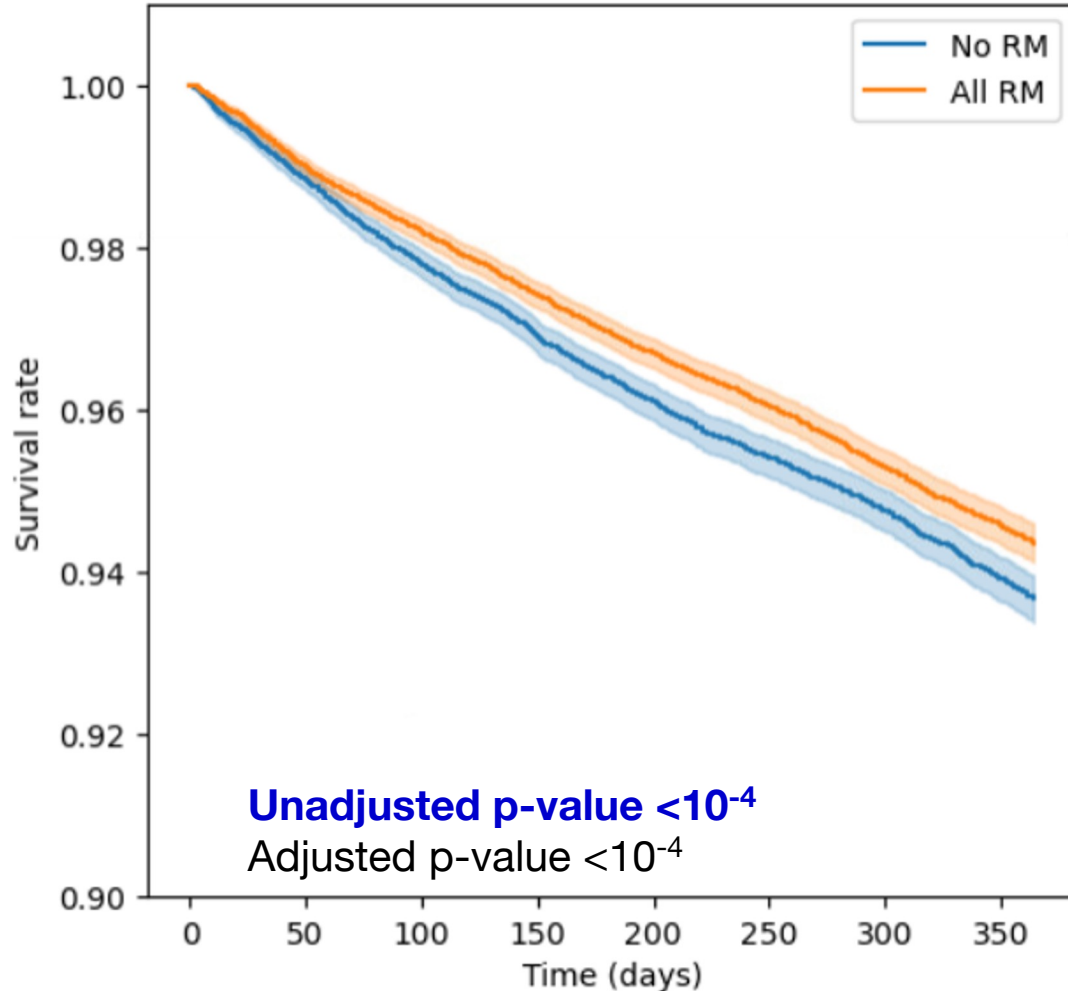


	All ICD/CRT-D (68,787)	No RM (29,912)	All RM (38,875)	Conventional RM (34,860)	Implicit RM (2,198)
Device Type	33.7% CRT-D (66.3% ICD)	26.0% CRT-D (64.0% ICD)	39.7% CRT-D (60.3% ICD)	39.8% CRT-D (60.2% ICD)	40.4% CRT-D (59.6% ICD)
Male Sex	77.4%	76.4%	78.3%	78.0%	82.1%
Age (yrs)	67.9 ±13.4	68.8 ±13.9	67.3 ±13.0	67.2 ±13.1	68.2 ±11.1
Time since implant (yrs)	3.58 ±2.79	4.08 ±2.68	3.16 ±2.82	3.16 ±2.81	3.49 ±2.83
Center Size (pts on RM)	NA	NA	592 ±569	603 ±592	522 ±272

Results: RM vs No-RM patients



Unadjusted Survival Rate



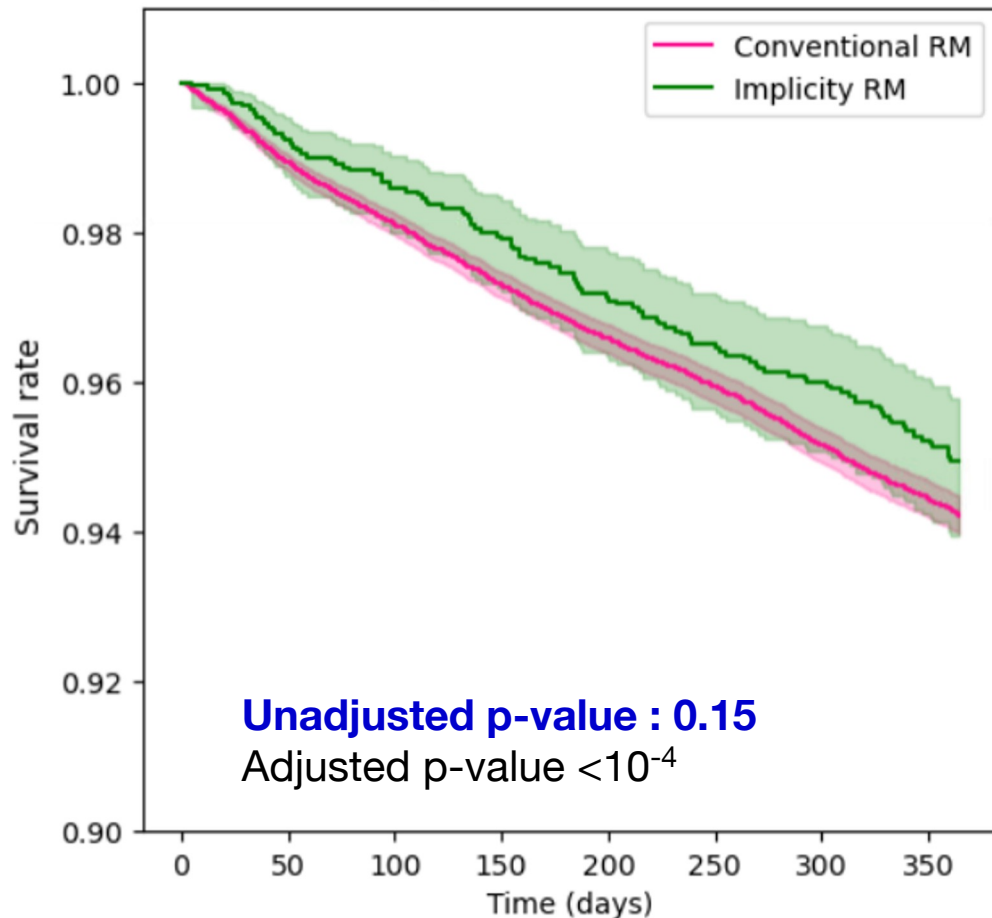
Adjusted Results using doubly robust model

	Baseline	Hazard Ratio
Mortality	6.09%	0.96 (-4%)**
Number of Hospitalizations (per pt/yr)	0.67	1.09 (+9%)**
Number of Hospitalizations (Heart Failure) (per pt/yr)	0.083	1.09 (+9%)**
Cumulated duration of Hospitalizations (days)	5.59	1.00 NS
Cumulated duration of Hospitalizations (Heart Failure) (days)	0.66	1.08 (+8%)**

** p value $<10^{-4}$

Results: Implicit RM vs Conventional RM

Unadjusted Survival Rate



Adjusted Results using doubly robust model

	Baseline	Hazard Ratio
Mortality	5.78%	0.78 (-22%)**
Number of Hospitalizations	0.72	0.96 (-4%)**
Number of Hospitalizations (Heart Failure)	0.091	0.96 (-4%)**
Cumulated duration of Hospitalizations (days)	5.51	0.94 (-6%)**
Cumulated duration of Hospitalizations (Heart Failure)	0.70	0.95 (-5%)**

** p value $<10^{-4}$

Limitations

- Retrospective study
- Potential survival / healthy user bias
- Observational cohort
- Limited clinical characteristics based on billing claims
- Limited details re: adherence, causes of deaths and hospitalizations
- Interventions (eg medication) in Implicit group to be evaluated

Conclusion



Remote monitoring of patients with CIEDs improves survival and reduces time spent in hospital when facilitated by a third-party platform

2023 HRS/EHRA/APHRS/LAQRS Expert Consensus Statement
on Practical Management of the Remote Device Clinic

Original abstract results can be found [here](#). Differences in results are due to methodological adjustments.

Varma N, Marijon E, Abraham A, Ibnouhsein I, Bonnet J-L, Rosier A, Singh J. Clinical impact of a universal remote monitoring platform for ICD and CRT-D follow-up from a large real-world registry. HRS. 2023.

#HRS2023



Thank you for your attention

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