

First page

Title: Knowledge, preferences of post-explant management and opinions towards reuse of patients with cardiac implantable electronic devices.

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Knowledge, preferences of post-explant management and opinions towards reuse of patients with cardiac implantable electronic devices

The high cost of Cardiac Implantable Electronic Devices (CIEDs) is the most significant barrier for the lack of treatment in Low and Middle Income Countries (LMICs). The literature suggests that reusing CIEDs is safe and could therefore be a cost-effective alternative for patients who do not have access to new devices¹.

Recent surveys indicated that around 20% of CIEDs explanted in funeral homes could potentially be reused and that the majority of electrophysiologists in the Rhythm Association of Spain support device donation to LMICs^{2,3}. However, there is no data on potential donor views about these practices.

This study aimed to describe the knowledge, preferences of post-explant management and opinions towards device donation of patients with CIEDs and to analyse their correlations with different socio-demographic variables.

Between February and October 2021, informed consent forms for participation in a telephone survey were handed to patients with CIEDs who attended follow-up consultations at the electrophysiology department of the University Hospital of Basurto. The questionnaire consisted of 17 open-ended, dichotomous, multiple-choice, 5-point Likert scale questions.

We collected socio-demographic and data about on the device type, total number of devices implanted, date of implantation of the first device and knowledge of the usual handling of explanted devices in hospitals and funeral homes, as well as preferences. Finally, patients stated their level of agreement about having a living will document to indicate the post-mortem management of their implants and with donating their device to CIED reuse programme.

Of the 136 patients who signed the consent form, 118 took part in the survey (response rate 86.7%). Table 1 shows the general characteristics of participants.

Patients showed low knowledge of the usual handling of explanted devices in hospitals and funeral homes, as in both cases, the vast majority indicated that they did not know what the usual process was (65.3% and 61.9%, respectively). Likewise, the second most common response in both cases was donation for human reuse, with 18.6% and 26.3% respectively, which is not currently practised in Spain. The number of implanted devices ($p=0.002$) and years with an implanted device ($p=0.032$) were correlated positively with the knowledge. The level of education of the participants ($p=0.015$) also correlated with the knowledge, with those with primary education having more knowledge.

Regarding preferences on the management of hospital explanted devices, the majority of participants indicated donation for human reuse (86.2%). Younger ($p=0.04$) and separated or divorced patients ($p<0.01$) were more in favour of human reuse.

Regarding preferences for devices explanted in funeral homes, the most indicated preference was also human reuse (79.3%). Age ($p=0.04$) and marital status ($p=0.007$) were also correlated with these preferences. We found also a correlation for sex ($p=0.031$), with women favouring human reuse more (94.7%) than men (71.8%).

81.9% of participants answered affirmatively to having a living will document in which they could reflect their preferences regarding the management of their implants after death. Patients who preferred to be cremated were more in favour (84.8%) than patients who preferred to be buried (65.6%) ($p=0.024$).

Finally, 89.8% of participants indicated that they would donate their device to a programme that could reuse them in patients without access to new devices

This study adds important information on how to develop a programme for CIED reuse in LMICs and how to effectively reclaim devices according to patients demographics. Our findings are consistent with the previous study by Gakenheimer et al, in which 68% of patients with CIEDs indicated that they were unaware of the disposition of devices after death, while 87% were in favour of human donation⁴.

Considering that, potentially reusable devices are currently discarded in our country and that local patients are in favour of humanitarian donation to LMICs, it would be interesting to discuss the possibility of implementing a CIED reuse programme. Given that, in most cases, implants are considered property of the patient an advance directives document could provide the necessary legal cover for device recovery and donation.

The vast majority of patient with CIEDs are willing to donate devices to patients without access to new devices.

This study was approved by the Ethics Committee of the University of the Basque Country, UPV/EHU on 24 June 2021.

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Table 1. General characteristics of participants.

		n (%)	mean \pm standard deviation [min-máx.]
Age			73.85 \pm 10.44 [51.31-95.74]
Sex	Male	78 (66.1)	
	Female	40 (33.9)	
Device type	Pacemaker	92 (78)	
	Defibrillator	17 (14.4)	
	CRT	9 (7.6)	
Total number of implanted devices	One	104 (88.1)	
	Two	8 (6.8)	
	Three	6 (5.1)	
Years with an implanted device			2.01 \pm 3.51 [0.12-16.71]
Level of education	Unschool ed	30 (25.4)	
	Primary studies	56 (47.5)	
	Secondary studies or vocational education	18 (15.3)	
	University studies	14 (11.9)	
Marital status	Single	6 (5.1)	
	Married	80 (67.8)	
	Separated or divorced	10 (8.5)	
	Widow(er)	22 (18.6)	
Has pets	Yes	12 (10.2)	
	No	106 (89.8)	
Has children	Yes	110 (93.2)	
	No	8 (6.8)	
Has a vital testament or advanced directives	Yes	20 (16.9)	
	No	98 (83.1)	
Preference for remains management after death	Burial	32 (31.4)	
	Cremation	70 (68.6)	