

# COMPARISON BETWEEN VISUAL ANALOGIC SCALES AND THE VALIOSA QUESTIONNAIRE FOR MEASURING PATIENT SATISFACTION WITH REMOTE MONITORING OF CARDIAC IMPLANTABLE ELECTRONIC DEVICES

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## BACKGROUND

Remote monitoring (RM) of cardiac implanted electronic devices (CIED) represents a complement to routine in-office care, improving patient safety. To assess CIED and RM performance, it has become frequent to analyze patient satisfaction and other Patient Reported Experience (PRE) Measurements using visual analogic scales (VAS).

## OBJECTIVE

The objective was to analyze the accuracy, validity and sensitivity of a VAS method as compared to a PREs questionnaire measuring patient satisfaction with RM of CIED. The hypothesis was that VAS measures would raise less accurate estimates due to wider confidence intervals.

## METHODS

- The Valiosa questionnaire is a 30 Likert item instrument arranged in 5 dimensions: 1- Information on cardiac condition (3 items), 2- Device convenience (3 items), 3- Transmission process (6 items), 4- Satisfaction with medical monitoring (8 items), and 5- General opinions (10 items).
- VAS 10-point scales gauging the same concepts/dimensions were used concurrently to measure patient satisfaction.
- A sample of 187 patients was gathered at four different Spanish centers.
- Means, standard errors and 95% confidence intervals were computed for VAS and questionnaire dimensions. Valiosa dimension scores were re-scaled to a 0-10 metric to allow direct comparison.
- Centers were compared using a fixed effects ANOVA and measurement methods were compared using related sample t-tests.
- Correlation between measurement methods was estimated using Pearson moment correlation.

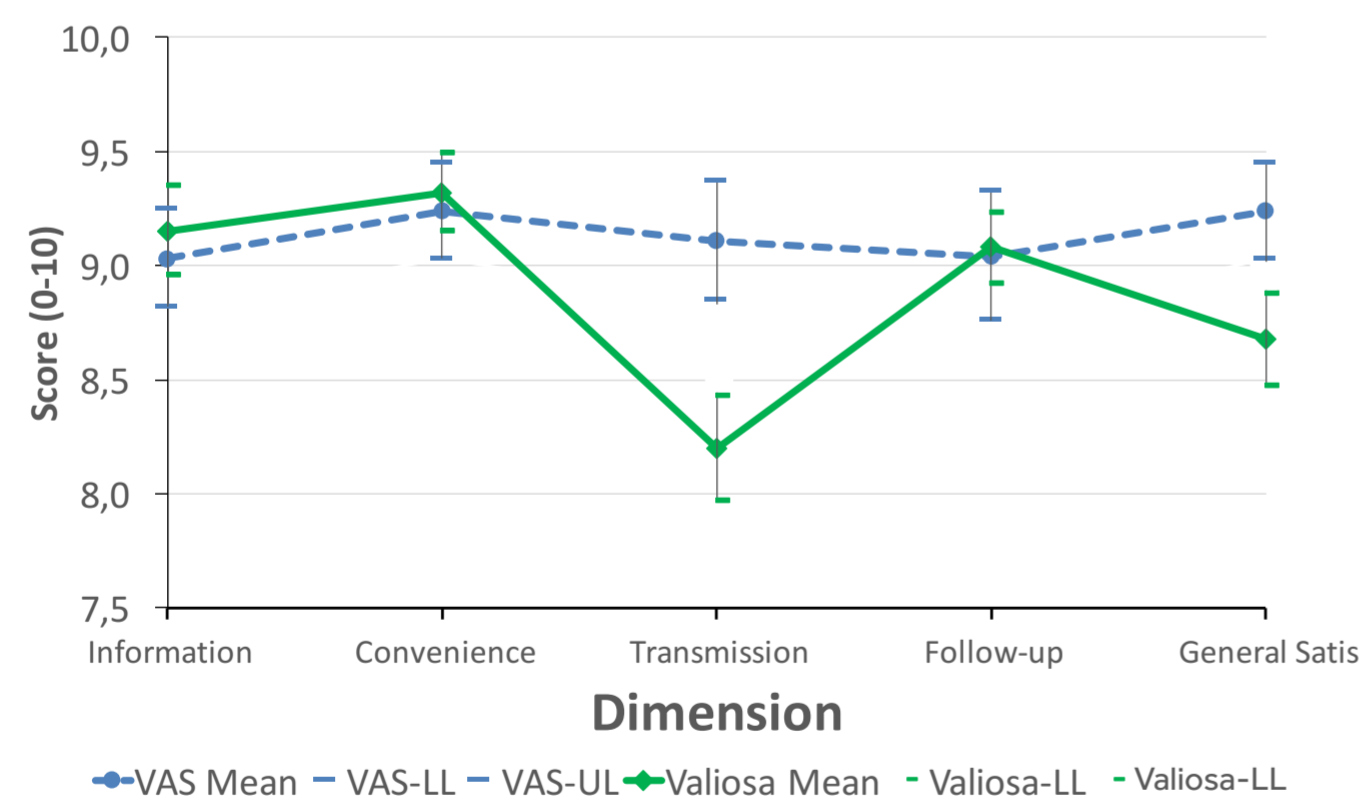


Figure 1. VAS and Valiosa scores by dimension (Mean & 95% CI)

Dimension	VISUAL ANALOGUE SCALE				QUESTIONNAIRE				Mean Dif
	Mean	95% CI		SE	Mean	95% CI		SE	
		Lower Limit	Upper Limit			Lower Limit	Upper Limit		
Information	9.03	8.82	9.25	0.11	9.15	8.96	9.35	0.10	0.013
Convenience	9.24	9.03	9.45	0.11	9.32	9.15	9.49	0.09	0.009
Transmission	9.11	8.85	9.37	0.13	8.20	7.97	8.43	0.12	0.100
Follow up	9.04	8.76	9.33	0.14	9.08	8.92	9.23	0.08	0.004
General Statis	9.24	9.03	9.45	0.11	8.68	8.47	8.88	0.10	0.061

Table 1. Mean, standard error and 95% confidence interval by measurement method

## RESULTS

- On average, patients were 66.1 (SD=14.06) years old, 76% were men, 45% were using implantable cardioverter-defibrillators (ICD), 32% pacemakers, and 22% cardiac resynchronization therapy devices (CRT).
- An overall Cronbach's  $\alpha=0.893$  was achieved, with acceptable reliabilities for isolated dimensions. Individual dimensions were well formed and exhibited some degree of correlation.
- Mean patient satisfaction measured by VAS ranged between 9.031-9.240, and mean differences for dimension averages ranged between 0.1 and 0.9 points, being VAS measures higher for Transmission and Overall satisfaction measures. Significant mean differences between measurement procedures were found in the Transmission ( $p<0.001$ ) and Overall satisfaction dimensions ( $p<0.001$ ).
- Dimension measurements correlated significantly ( $p<0.001$ ) with values between 0.33 and 0.49. Standard errors were between 3% (overall satisfaction) and 83% (follow-up) higher for VAS measures, and so were confidence interval widths accordingly.
- Not all VAS measures were able to discriminate between centers, with Information ( $p=0.128$ ) and Follow-up ( $p=0.115$ ) dimensions not being sensitive enough, while all VALIOSA dimensions were able to discriminate between centers ( $p<0.001$ ).
- Valiosa dimensions showed a similar pattern on differences in scoring between centers while VAS measures showed some degree of interaction.

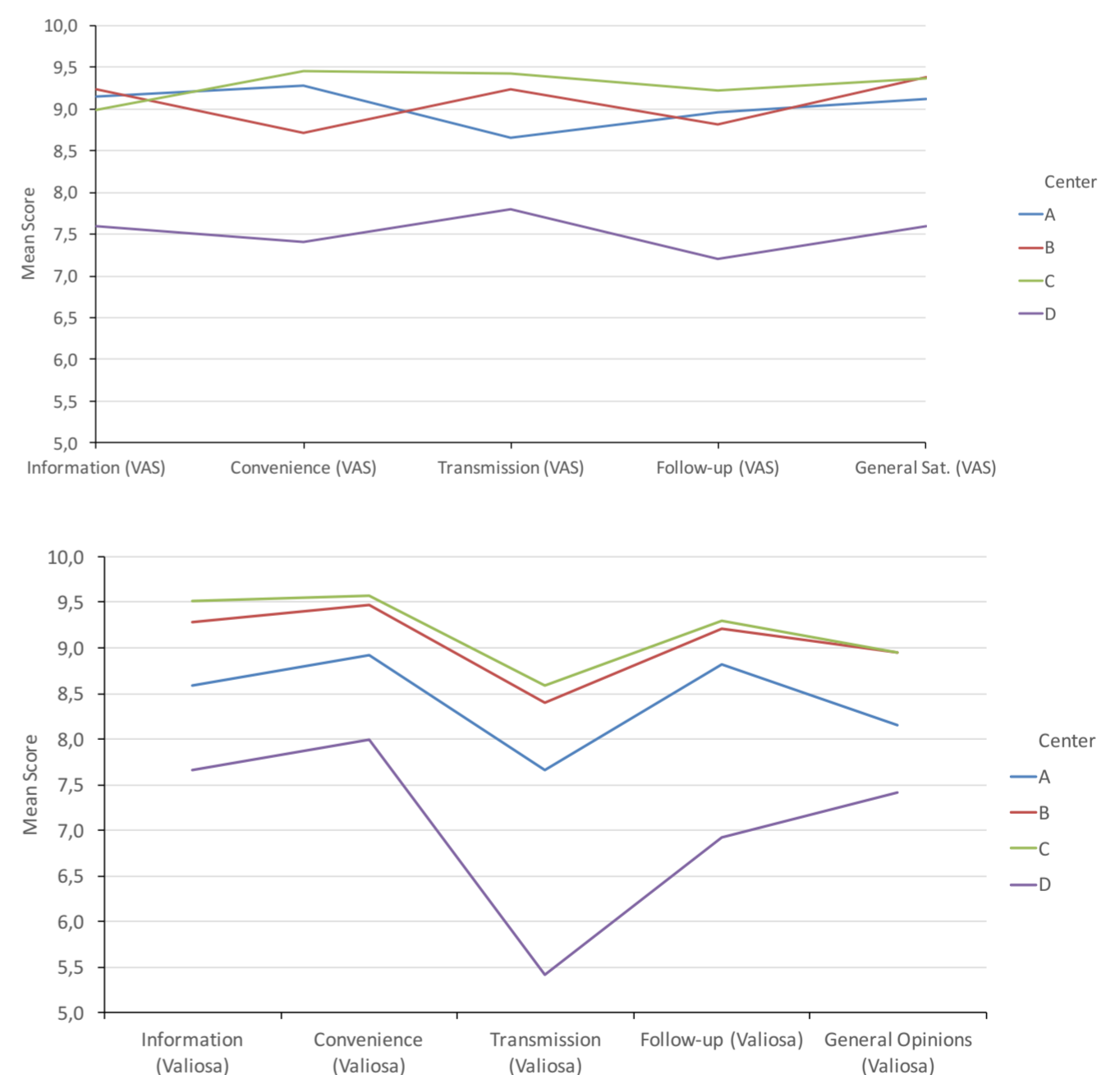


Figure 2. VAS (up) and Valiosa (down) mean scores by dimension and Center

## CONCLUSIONS

- Both Visual Analogic Scale and questionnaire dimensions showed to be sensitive to existing differences, with questionnaire valuations being more accurate, as expected. The level of satisfaction of patients with remote monitoring in Spain measured by a specific instrument is high.
- These tools can become useful in quality-of-care assessment, they can be used to benchmark between different healthcare organizations and be included as an indicator of the quality of healthcare, helping in the implementation and assessment of pay for performance agreements.