Longevity of implantable cardioverter-defibrillators, influencing factors, and comparison to industry-projected longevity

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BACKGROUND
Because the best possible device longevity is crucial (i.e., risk of infection with premature device exchange, current cost-effectiveness calculations depending on reasonable longevity, patient comfort), industry-independent real-life data are fundamental. However, only limited independent data on the longevity of implantable cardioverter-defibrillators (ICDs) are available.

OBJECTIVE
The purpose of this study was to determine ICD device longevity and influencing factors.

METHODS
From a prospective database, we studied overall device longevity and identified those devices with replacement for battery depletion or prolonged charge time. For every device, we determined factors that included averaged shocks, pacing percentage, pacing mode, device size, and time of implant. Survival probabilities at different time intervals were calculated, and Kaplan-Meier and Cox regression analyses were used. Observed longevity was compared to industry-projected longevity obtained from product performance reports.

RESULTS
A total of 644 ICDs (Medtronic 317, Guidant 189, St. Jude 118, Intermedics 20) were implanted in 499 patients. During follow-up, 163 (25.3%) ICDs were replaced. Manufacturer, time of implant, pacing mode, pacing percentage, and capacitor reformation interval influenced longevity, whereas device size and number of shocks did not. Median longevity was 7.6 years for Medtronic devices, 5.0 years for Guidant devices, and 3.8 years for St. Jude devices. After 5 years, only 70% of ICDs were still in service compared to the 80% projected by industry.

CONCLUSION
Marked differences in device longevity among manufacturers cannot be explained by pacing mode, number of shocks, or pacing percentage only.
Overall, device performance requires further improvement for the sake of patient health and cost.

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