

# IMPACT OF PRE-TRANSPLANT IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR STATUS ON LONG-TERM SURVIVAL IN HEART TRANSPLANT PATIENTS

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## *Original Research*

**Background/Objectives:** The benefit of implantable cardioverter-defibrillators (ICD) in patients with advanced heart failure is well established. The role of ICD therapy in patients requiring heart transplantation is less clear as current guidelines do not recommend ICD therapy for patients with NYHA class IV symptoms and drug-refractory heart failure<sup>1</sup>. A large meta-analysis recently demonstrated a benefit of ICD placement in patients awaiting heart transplantation<sup>2</sup>, however limited data is available examining ICD status on long-term survival. The objective of this study was to identify variables which make patients more likely to receive an ICD prior to transplantation and to understand the impact of pre-transplant ICDs on long-term survival.

**Methods:** United Network for Organ Sharing (UNOS) registry was queried for all adult heart transplant recipients (HTR) from 1999 to 2018. Chi-square tests were run to detect associations between ICD status at registration and patient variables. Cox regression modeling adjusting for the confounding variables recipient age/race-ethnicity/gender, donor age/race-ethnicity/gender, year of transplantation, previous transplantation, and acute rejection status (treated, untreated, none) was performed to detect differences in patient survival time (days) based on ICD status.

**Results:** Of 19,026 patients, 14,960 had received an ICD at time of registration (78%). Patients with an ICD were more likely to be African American, male, and older than their counterparts by 6 years. ICD cases were much less likely to have previous transplantation (0.6% vs 9.7%). Cox regression analysis demonstrated that survival did not vary by pre-transplant ICD status (HR=0.98; CI95 0.90-1.07).

**Conclusions:** The results of this study identify patients who are more likely to have ICD placement prior to transplantation. Based on the results it can also be concluded that pre-transplant ICD status does not impact post-transplant survival. These results, in conjunction with research demonstrating a short-term benefit of ICDs, suggest the decision to place an ICD pre-transplant should be a case-by-case decision.

1. Al-Khatib SM, Stevenson WG, Ackerman MJ, Bryant WJ, Callans DJ, Curtis AB, Deal BJ, Dickfeld T, Field ME, Fonarow GC, Gillis AM, Granger CB, Hammill SC, Hlatky MA, Joglar JA, Kay GN, Matlock DD, Myerburg RJ, Page RL. 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Heart Rhythm*. 2018 Oct;15(10):e73-e189. doi: 10.1016/j.hrthm.2017.10.036. Epub 2017 Oct 30. Erratum in: *Heart Rhythm*. 2018 Sep 26;: PMID: 29097319.
2. Lin AY, Duran JM, Sykes A, et al. Association between implantable cardioverter-defibrillator and survival in patients awaiting heart transplantation: A meta-analysis and systematic review. *Heart Rhythm O2*. 2021;2(6Part B):710-718. Published 2021 Dec 17. doi:10.1016/j.hroo.2021.09.013