Electrophysiologist Visits Among a Real-World Cohort of Guideline-Indicated Patients: Implications for ICD Use

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**Introduction**: The value of ICD therapy for the prevention of sudden cardiac death is well established. In the US, most ICDs are implanted by electrophysiologists (EPs). Patterns of referral nationally in ICD-indicated patients are not well studied. We sought to examine EP referral and implant patterns in a 2016 prevalence pool of ICD-indicated patients using electronic health records (EHR).

**Methods**: Records from 1.54 million US patients from the Optum® EHR de-identified dataset with a diagnosis of HF, cardiomyopathy, or prior infarct from 2007-2016 were evaluated for Class 1 or Class 2a indications for an ICD, using algorithms developed as part of the GLIDE HF (GuideLine Indications Detected in EHR for HF) program. Patients were included if they had records that met criteria for an ICD recommendation, were <79 years, were alive in 2016, and did not have neurologic exclusions. Office visits, consults, and diagnostic imaging encounters were identified for the group of providers identified as EPs. Patients were divided into two groups, based on whether they were determined to have seen an EP through an office visit, consult, or diagnostic imaging encounter.

**Result**: Among the 226,978 patients who had records of a Class 1 or 2a indication for an ICD, 122,678 (54.1%) had not seen an EP. In patients who had no record of being seen by an EP, 12,374 (10.1%) had a new device implant, compared to 46,304 of 104,300 (44.4%) who had seen an EP. Among ICD-indicated patients with no EP visit or consult, 67.1% had 2 or more encounters with a cardiologist. In the subgroup of patients with an indication for secondary prevention, 25,279 of 44,530 (56.8%) were seen by an EP and were more likely to have a device implanted (63.8% for EP, 21.2% for no EP). In patients with primary prevention indications, 66,418 of 154,497 (43.0%) were seen by an EP and were more likely to be treated with an ICD (36.1% for EP, 8.5% for no EP).

**Conclusion**: Less than half of patients with records of an ICD indication were referred to an EP in this retrospective analysis. Patients who had survived sudden cardiac arrest were more likely to be seen by an EP. Patients with an EP visit were more likely to receive guideline-indicated defibrillators.