

Study evaluates effect of increasing detection intervals in implantable cardioverter-defibrillators

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Programming an implantable cardioverter-defibrillator (ICD) with a long-detection interval compared with a standard-detection interval resulted in a reduction in anti-tachycardia pacing episodes, ICD shocks delivered, and inappropriate shocks, according to a study in the May 8 issue of *JAMA*.

"Therapy with ICDs is now the standard of care in primary and secondary prevention. As indications for implants have expanded, concern about possible adverse effects of ICD therapies on [prognosis](#) and quality of life has arisen. Several authors have reported that ICD therapies, both appropriate and inappropriate, are associated with an increased risk of death and worsening of [heart failure](#). To reduce these unfavorable outcomes, several studies have focused on identifying the best device programming strategies, either by targeting the anti-[tachycardia](#) pacing [ATP; use of pacing stimulation techniques for termination of tachyarrhythmias] algorithms for interrupting fast ventricular tachyarrhythmias [[abnormal heart rhythm](#)] or by investigating the use of prolonged arrhythmia detection intervals," according to background information in the article. "Using more intervals to detect ventricular tachyarrhythmias has been associated with reducing unnecessary ICD therapies."

Maurizio Gasparini, M.D., of the Humanitas Clinical and Research Center, Rozzano, Italy, and colleagues conducted a study (ADVANCE

III) to determine whether using 30 of 40 intervals to detect ventricular arrhythmias (VT) (long detection) during spontaneous fast VT episodes reduces ATP and shock delivery more than 18 of 24 intervals (standard detection). The [randomized trial](#) included 1,902 primary and secondary prevention patients (average age, 65 years; 84 percent men; 75 percent primary prevention ICD) with ischemic and nonischemic etiology undergoing first ICD implant at 1 of 94 international centers (March 2008-December 2010). Patients were randomized 1:1 to programming with long (n=948) or standard-detection (n=954) intervals.

Overall, 530 episodes were recorded and classified by the devices as ventricular arrhythmias. During a median (midpoint) follow-up of 12 months, the long-detection group had a 37 percent lower rate of delivered therapies (ATP and shocks) (346 vs. 557) compared to the standard-interval detection group. Estimates of the time to the first ICD therapy (ATP or shock) showed a significantly lower probability of receiving a therapy in the long-detection group.

The researchers also found that the frequency of appropriate shocks was similar between the groups, while the long-detection group was associated with a significantly lower incidence (45 percent lower rate) of inappropriate shocks. In addition, a lower hospitalization rate was observed in the long-detection group. No significant difference in mortality rates was seen between the groups.

"ADVANCE III demonstrated that the use of a long detection setting, in ICDs with the capability of delivering ATP during capacitor charge, significantly reduced the rate of ventricular therapies delivered and inappropriate shocks compared with the standard detection setting," the authors write. "This programming strategy may be a useful approach for ICD recipients."

Merritt H. Raitt, M.D., of the Portland Veterans Administration Medical

Center and Oregon Health and Science University, Portland, comments on the findings of this study in an accompanying editorial.

"The findings from the ADVANCE III trial by Gasparini et al add important new information to the evidence base of ICD programming for prevention of [ventricular arrhythmias](#). Regardless of whether these programming interventions lead to reduced mortality, the unequivocal reduction in ICD [shocks](#) and the reduction in hospitalization without an increase in adverse events such as syncope suggests that this programming approach should be considered for adoption in the care of patients with ICDs and clinical characteristics similar to those enrolled in these studies."

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