Ampere Hour (Ah) as a Predictor of CRT ICD Pulse Generator Battery Longevity: A Multi-Center Study
A poster presented at Heart Failure Society of America’s (HFSA) 2014 Annual Meeting comparing contemporary CRT-D longevity

DESCRIPTION
Ampere hour (Ah) as a Predictor of CRT ICD Pulse Generator Battery Longevity is a multi-center, retrospective observational study that analyzed the relationship between the residual PG battery capacity (Ampere hour or Ah) in contemporary cardiac resynchronization therapy defibrillators (CRT-Ds) and device longevity in all patients implanted with CRT-ICDs from August 1, 2008, to December 31, 2010, at Vanderbilt University, Eastside Cardiovascular Medicine, University of Michigan, Thomas Jefferson University, Robert Wood Johnson University Hospital, Cooper Health System, and North Ohio Research.

IMPORTANT OUTCOMES
- Ampere hour (Ah) is a useful predictor of survival to ERI for modern CRT-D generators
- CRT-D replacement (ERI) occurred in 12.4% of 1 Ah systems (72/582), versus 4.05 in 1.4 Ah (6/149) and 0.45 in 2 Ah devices (1/266) over mean follow-up of 3.1 years
- Patients with 1 Ah CRT-D had lower AF burden (32.9% vs 46.1% (2 Ah), and 53.4% (1.4 Ah), P=0.0006). 1 Ah devices were more likely to have >75% atrial pacing (20.4%, vs 8.6% (2 Ah), 16.7% (1.4 Ah), P=0.005)

Data collected from 710 patients showed that battery capacity (Ah) is a useful predictor of device longevity and Boston Scientific devices, with a battery capacity of 2.0 Ah, last significantly longer than Medtronic or St. Jude Medical devices.

Log-rank P-values (Comparing Survival Curves)
Any Difference < 0.001 2.0 Ah vs 1.4 Ah 0.0013 1.0 Ah vs 1.4 Ah 0.0036

GET THE FACTS AND CUT THE RISK.
Boston Scientific offers ICDs and CRT-Ds designed to be the world’s longest lasting — with up to 80% more battery capacity than other available models. Better CRT-D longevity could mean a reduced risk of exposure to complications and infections for your patients.
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PATIENT COHORT
710 patients from multiple sites (Vanderbilt University, Eastside Cardiovascular Medicine, University of Michigan, Thomas Jefferson University, Robert Wood Johnson University Hospital, Cooper Health System, and North Ohio Research). Average age at implant: 67.1 ± 11.8 years. Mean LVEF: 25.3 ± 12.8%. Mean QRS duration: 152.4 ± 25.0 ms. NYHA class III: 71.0%. Medtronic = 587 patients, St. Jude = 153 patients, Boston Scientific = 273 patients.

METHODS
• The multi-center retrospective study included all CRT-Ds implanted from August 1, 2008, to December 31, 2010, at the sites listed above
• Patients were followed over an average of 3.1 ± 1.3 years (582 1Ah Medtronic, 266 2Ah Boston Scientific, and 149 1.4Ah St. Jude Medical)
• Baseline demographics, device, and lead data were obtained from the electronic medical record
• Covariates that can affect time to battery depletion were included in a multivariate Cox proportional hazard model
• Analysis was performed between 1.0 Ah, 1.4 Ah, and 2.0 Ah devices as defined by manufacturer specifications
• Comparison was made between devices for the presence of atrial fibrillation high LV lead >3 ICD shocks in the lifetime of the device, and % atrial pacing by quartile

PRIMARY ENDPOINTS
PG survival was calculated from implant date to time of PG replacement, heart transplant, device infection, or patient death.

PRINCIPAL INVESTIGATOR
Christopher R. Ellis, MD, FACC, FHRS, Director Clinical Arrhythmia Research & Assistant Professor Cardiac Electrophysiology, Vanderbilt Heart and Vascular Institute.

1. Ellis C, Markus T, Siekman D, Orton J, Hassan S, Good E, Okada T, Grosenopon A. Ampere Hour as a Predictor of CRT ICD Pulse Generator Longevity: A Multi-Center Study. Presented at HFSA 2014. http://www.onlinejcf.com/article/31097/919467400057518714/Ampere-Hour-As-a-Predictor-of-CRT-ICD-Pulse-Generator-Longevity-A-Multi-Center-Study. Ampere Hour (Ah) as a Predictor of CRT ICD Pulse Generator Battery Longevity is a multi-center, retrospective observational study comparing battery longevity of contemporary cardiac resynchronization therapy defibrillators (CRT-Ds) of all patients implanted with CRT-ICDs from August 1, 2008, to December 31, 2010, at Vanderbilt University, Eastside Cardiovascular Medicine, University of Michigan, Thomas Jefferson University, Robert Wood Johnson University Hospital, Cooper Health System, and North Ohio Research.

2. PG survival was calculated from implant date to time of PG replacement, heart transplant, device infection, or patient death.


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