Introduction: Quadripolar (Quad) left ventricular (LV) leads provide more pacing options to improve CRT response, maximize device longevity and avoid phrenic nerve stimulation. Medtronic Attain Performa leads are equipped with 16 programmable pacing polarities. Four of these (LV1 to RV Coil, LV2 to RV Coil, LV1 to LV2 and LV2 to LV1) are traditional polarities available with bipolar leads. However, there is limited data demonstrating improvement in patient outcomes with Quad exclusive LV pacing polarities.

Methods: Data from the Optum© Electronic Health Record (EHR) de-identified database were linked with the Medtronic CareLink™ Network and de novo Quad CRT-D device implants between 2013 and 2017 were identified. Patients were followed for up to 24 months. LV pacing polarity was compared for the primary outcome of all-cause mortality. Differences in mortality were adjusted for age, gender, diabetes, hypertension, myocardial infarction and coronary artery disease.

Result: Data from 4780 patients with Quad leads was available for analysis. Age was 68 ± 11 years at implant, 29% of patients were female and the follow-up duration was 12 ± 8 months. A traditional LV pacing polarity was programmed in 49% of patients. The most commonly programmed traditional LV pacing polarity was LV1 to LV2 in 24% of patients, while the most commonly programmed Quad exclusive polarity was short bipolar LV2 to LV3 in 15% of patients. At 24 months, mortality was significantly higher in the traditional LV group (11.7% vs. 8%, p < 0.001). A Quad exclusive LV pacing polarity was associated with a lower rate of death after multivariable adjustment (HR: 0.71, CI: 0.54 to 0.93, p= 0.012).

Conclusion: Quad exclusive LV pacing polarities were associated with improved survival in this observational read-world experience. This difference may reflect more targeted pacing site selection with Quad exclusive polarities. Newer leads such as the active fixation Attain Stability Quad lead which allows placement at an increased range of implant sites may further improve survival after CRT.