An Extended Spacing CRT Lead Improves Delivery of "Optimal MPP" Programming

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**Introduction**: Quadripolar CRT leads make multi-point (MPP) CRT pacing possible. Subgroup analysis of the Multipoint Pacing US IDE Study revealed a significant improvement in CRT response rates when MPP electrode spacing was $\geq 30$mm and timing was $5$ms ("Optimal MPP"). We show that these parameters are more likely to be met with use of an extended spacing CRT lead.

**Methods**: A total of 28 patients were provided quadripolar CRT by a single implanter as part of the US FDA mandated Multipoint Pacing Post Approval Study. An extended spacing CRT lead (Abbott Medical 1458QL, 60mm maximum electrode spacing) was attempted in all cases. Follow up was per MPP PAS protocol.

**Result**: 23 of 28 (82%) patients successfully received the extended spacing (1458QL) lead. 5 of 28 (18%) received a non-extended spacing CRT lead (1458Q), typically due to coronary sinus branch vessel limitations. 9 of 23 (39%) 1458QL patients were programmed with "Optimal MPP". 1 of 5 (20%) 1458Q patient was programmed with "Optimal MPP". 1458QL utilization in the overall MPP PAS was 138 of 948 (14.6%) patients. "Optimal MPP" programming in the overall MPP PAS was 70 of 948 (7.4%) patients. Of the 14 1458QL patients who did not receive "Optimal MPP" programming in this report, 2 were lost to follow up, 1 developed loss of capture of the 2 most proximal electrodes, 3 developed phrenic nerve stimulation, 3 had $\geq 30$mm spacing but did not meet 5ms timing criteria, and 5 were reprogrammed by other cardiology providers for unclear reasons.

**Conclusion**: An extended spacing CRT lead can be delivered in nearly all patients (82%). Such spacing provides more options for "Optimal MPP" programming as outlined in the subanalysis of the MPP US IDE Study (39% success in this report). Reprogramming by other cardiology providers, perhaps due to a lack of familiarity with MPP CRT, was the most frequent cause of non-"Optimal MPP" programming.