

## The nature of fast and slow pathway interaction during premature pacing: evaluation with high density mapping

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**Background:** Dual AV Nodal (AVN) inputs are associated with the fast pathway (FPW) superiorly, while the SPW activates inferiorly. In the present study, we evaluate the impact of PES on dual antegrade conduction.

**Objective:** To Define Antegrade Conduction Properties of the AV Node during PES

**Methods:** High density mapping (Orion, Rhythmia) was performed and analyzed in SR and S2 PES in 12 pts. The FPW activates the AVN and travels inferiorly, there is a point where the activation pivots toward the SPW and travels superiorly along the TV. The distance from the pivot point was measured to the HIS location in sinus rhythm and for each coupling interval. Both the distance and prematurity of the S2 coupling was normalized to the BCL during sinus rhythm. The coupling interval was then plotted vs the HIS-Collision distance. A regression analysis was used to compare data sets with significance defined as  $<0.05$ .

**Results:** Data was obtained in all 12 patients. In all patients, as prematurity of S2 increased, the pivot point moved superiorly until there was block in the FPW and activation to the AV node was entirely from the SPW. There is a functional line of block (LOB) between the FPW and SPW. Comparing normalized data decrement vs change in pivot point:  $R=0.8$   $p<0.0001$

**Conclusion:** During PES, the F/SPW interaction changes: increasing prematurity causes pivot point to move superiorly until the FPW blocks and AVN activates via the SPW. Decremental antegrade conduction occurs within FPW and is associated with the superior pivot shift toward the AVN suggesting a functional LOB. This relationship is linear.

