

## Computed tomographic predictors of conduction disturbances following TAVI using the Evolution Series

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### Introduction:

Conduction disturbance requiring a new permanent pacemaker (PPM) after TAVI is still a common complication, particularly with the new-generation Evolut platform.

We aimed to investigate the predictors of new PPM post-Evolution implantation at 30-day.

### Methods:

At University Hospital Galway, we screened 150 consecutive patients between October 2019 and August 2022 who underwent TAVI with the Evolut platform, after exclusion of patients who had PPM at baseline (n=10), patients having a valve-in-valve procedure (n=8) and patients need 2nd valve procedure (n=3). For the prediction of new conduction disturbance requiring PPM implantation at 30-day a total of 129 patients were included in our study. A detailed CT analysis, including the membranous septum (MS) length, semi-quantitative calcification analysis of aortic valve leaflets, left ventricular outflow tract and mitral annulus (MAC). Furthermore, the implantation depth (ID) was measured from the final aortograms.

### Results:

The rate of new PPM at 30-day in the total cohort was 10% (n=15), while the rate in the final study cohort was 11.6% (n=15). The patients who required new PPM at 30-day were more likely to have a lower EuroSCORE II (1.9 [1.7, 3.2] vs 3.3 [2.1, 5.4],  $p = 0.008$ ), more likely to have RBBB (47% vs 8%,  $p < 0.001$ ). In the patients who required new PPM implantation, the membranous septum length was shorter (1.5 [1.1, 2.5] vs 3.1 [2.3, 4],  $p=0.002$ ). A higher rate of  $\geq$  moderate mitral annular calcification (MAC) (60% vs 33%,  $p=0.047$ ) was also observed in patients with new PPM. A deeper implantation depth at the NCC was associated with new PPM (4.4 [4.1, 5.7] vs 3.6 [2.6, 4.1],  $p < 0.001$ ). likewise, the difference between the MS length and the implant depth was significantly more in the patients who required PPM ( $-3.9 \pm 1.5$  vs  $-0.3 \pm 2.4$ ,  $p < 0.001$ )

### Conclusion:

Membranous septum length and implantation depth were found to be independent predictors of new PPM post-TAVI with the Evolut platform. patient-specific implantation depth could be used to mitigate the new PPM rate.