Introduction: Arrhythmogenicity in patients with primary prevention of ICD (1ry-pts) is thought to still have not been accomplished because several clinical data showed lower incidence of appropriate ICD therapy (app-Tx) in 1ry-pts compared with secondary ICD patients (2nd-pts). We hypothesized that the substrates for VT/VF in 1ry-pts have deteriorated to the same extent as 2nd-pts after 1st app-Tx.

Methods: To test our hypothesis, we conducted sub-analysis of the NIPPON Storm Study, which was a prospective observational study involving 985 patients with structural heart disease (LVEF≤50%) enrolled from 48 Japanese centers. Incidence of 1st app-Tx was compared between 1ry-pts (n=531) and 2nd-pts (n=454). Further, we selected 251 patients (62±14 yo, 82% male) who experienced at least one appropriate ICD therapy, and compared occurrence of 2nd app-Tx between 1ry-pts (n=116) and 2nd-pts (n=135).

Result: 1st app-Tx was observed significantly higher in 2nd-pts than 1ry-pts (log-rank p=0.0013, Fig). However, there was no significant difference in subsequent 2nd app-Tx between 1ry-pts and 2nd-pts (log-rank p=0.8141, Fig). In addition, we evaluated incidence of 2nd app-Tx according to respective basal structural disease, i.e., ischemic and non-ischemic cardiomyopathy, and found no significant differences between 1ry-pts and 2nd-pts among these sub-groups (log-rank p=0.2613 and p=0.9801 respectively).

Conclusion: Once an app-Tx occurred, arrhythmogenicity may have been accomplished in 1ry-pts because there was a comparable incidence of subsequent app-Tx to 2nd-pts.