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**Novel techniques limit the exposure of children to ionizing radiation related to electrophysiology and ablation procedures.**

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Introduction
The number of electrophysiology and ablation procedures in children rise in the recent years and so is the related risk of exposure to ionizing radiation. The ALARA rule requires to limit the risk to the necessary minimum. The technological advancements are promising means to the goal. We aim to assess the actual impact of non-fluoroscopic guiding systems (NFGS) during electrophysiological studies (EPS) and catheter ablation procedures (CAP) for the treatment of tachycardia in children.

Methods
We retrospectively analyzed the records of patients undergoing EPS and RFCA. NFGS included EnSiteTM NavX or CARTO® mapping. We analyzed fluoroscopy time, radiation dose area product (DAP). Data is presented as mean ± standard deviation or median (range) dependently on the distribution. Chi-square test, Mann-Whitney and Pearson correlations were employed.

Results
A total of 121 patients and 140 procedures were included with 4 patients a total of three procedures and 11 two. The patients were 15.2 years-old (2.5-18.0) and 76 were male (54%). Forty-four (31%) procedures were done under general anesthesia. The final diagnosis was most commonly AVRT n=69 (55%), AVNRT n=37 (29%) and focal AT n=10 (8%). There were 129 (92%) CAP including 108 (77%) radio-frequency catheter ablations (RFCA), 21 (15%) cryo-ablations (CRYO), and 11 (8%) EPS. In 78 (56%) procedures no NFGS was used, in 46 (33%) NavX, and 16 (11%) CARTO (total of 62, 44%). There was no significant difference in baseline characteristics (age and diagnosis) between no-NFGS and NFGS groups (p=0.407 and p=0.633 respectively) as well as in acute success rate (p=0.404). The fluoroscopy time was significantly longer for CAP 9.0min (0.5–61.0min) vs EPS 3.2min (1.7–6.0min; p=0.022) and so was the radiation dose 5.0 Gy*cm2 (0.02–316.3 Gy*cm2) vs 1.2 Gy*cm2 (0.1–6.1 Gy*cm2) respectively (p=0.022). The fluoroscopy time was significantly longer for no-NFGS 15.0min (0.5–61.0min) vs NFGS 5.0min (0.7–25.0; p<0.001) and so was the radiation dose 7.8 Gy*cm2 (0.1–118.5 Gy*cm2) vs 1.5 Gy*cm2 (0.02–315.4 Gy*cm2) respectively (p<0.001).

Conclusions
The introduction of NFGS for EPS and RFCA in children significantly reduced fluoroscopy time and radiation dose thus increasing the safety of the procedures.