RESULTS Nobody died at the short-term. At the long-term period 7 patients (16.6%) passed away (all-cause mortality). Sudden cardiac death was observed in 2 cases. 1 patient died due to ischemic stroke. In 4 cases the reason of death was not established (unknown). Mean NYHA class at the follow-up was 1,9 (0.5). 9 patients (21.4%) suffered from residual LVOT obstruction. Just 1 patient underwent implantable cardioverter defibrillator insertion. 3/42 patients (7.1%) underwent the pacemaker insertion due to a complete heart blockage. 12-year survival were 78.9%. Multi-variant analysis identified age younger than 35 years before ASA (p=0.041, odds ratio 0.188, 95%CI: 0.034-1.038) and pacemaker implantation after ASA (p= 0.016, odds ratio 0.074, 95%CI: 0.006-0.968) as predictors for long-term death.

CONCLUSIONS Long-term more than 10-years results of ASA look appropriate, and consistent with largest Euro-ASA registry. Unselected type of historical patient's cohort might slightly decrease the effectiveness of such kind of therapy. Our data emphasize concern of ASA in patients younger 35 years.

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A Pulsatile In Vitro-model of Infective Endocarditis

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OBJECTIVE Infective endocarditis (IE) is still associated with a high morbidity and mortality. IE is characterized by bacterial biofilms of the endocardium, especially of the aortic and mitral valve leading to destruction of the valve. Current research demonstrate that about one quarter of the patients with formal surgery indication cannot undergo surgery. This group of patients needs further options of therapy, but due to a lack of models for IE, prospects of research are low. Therefore, the purpose of this project is to establish an in vitro-model of infective endocarditis to allow growth of standardized bacterial biofilms on porcine aortic valves, serving as baseline for further research.

METHODS AND RESULTS A pulsatile two-chamber circulation model was constructed that kept native porcine aortic valves under sterile, physiologic hemodynamic and temperature conditions. To exclude external contamination, repeated (n=5) sterility tests with sterile culture media were performed for 24h with 5l cardiac output per minute. After this time period, no macroscopic growth of microorganisms was observed, and cultures after plating on standard media remained negative. To create biofilms on porcine aortic valves, the system was inoculated with *Staphylococcus epidermidis*. Porcine aortic roots were incubated in this system for increasing periods of time (8h, 24h and 40h) to evaluate bacterial growth and biofilm development on the valves. After incubation, specimens were embedded and tissue sections were analyzed by fluorescence-in-situ-hybridization (FISH) for direct pathogen detection and visualization of the biofilms. The monospecies colonization was confirmed by culture and 16S rRNA-PCR with sequencing. The pilot tests for biofilm growth showed coccoid biofilms with time- dependent increasing growth after 8h, 24h and 40h. One of the 40h experiment performed PCR showed *S. epidermidis* as only pathogen of the biofilm with a matching genotype of 99%. The other n=3 experiments for biofilm creation showed biofilms with active cocci, good tissue infiltration and similar colonization pattern after 40h.

CONCLUSION These results demonstrate the efficacy of the above in vitro-model for bacterial biofilm growth on porcine aortic roots. The model will allow identification of predilection sites of valves for bacterial adhesion and biofilm growth, and it may serve as baseline for further research on infective endocarditis therapy, e.g. the development of antimicrobial transcatheter approaches to IE.

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Radiation Dose Reduction in Structural Heart Disease Interventions Using Noise Reduction Technology

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BACKGROUND The Phillips AlluraClarity noise reduction technology (NRT) reduces the total amount of radiation to the patient and operator with minimal degradation in image quality during fluoroscopy-based procedures. Radiation dose reduction has been reported in transcatheter aortic valve replacement (TAVR), but not for other structural interventions.

METHODS In this retrospective single-center experience, we report the total fluoroscopy time and radiation dose area product across the three structural interventions we offer: TAVR, MitraClip, and the Watchman left atrial appendage closure device before and after upgrading to NRT. Fluoroscopy time and radiation dose measured as dose area product were compared across the structural interventions before and after NRT upgrade. A Kruskall-Wallis H test was used to compare times and radiation doses with and without NRT.

RESULT We analyzed 531 TAVR cases from February 2012 to August 2017 (68 done with NRT), 127 MitraClip cases from February 2014 to September 2017 (11 done with NRT), and 83 Watchman cases from April 2015 to August 2017 (12 done with NRT). There was a consistent statistically significant decrease in radiation dose (see statistics Table 1). Mean fluoroscopy time was significantly decreased in TAVR (23.7 vs 17, p=0.0001) while not significantly changed in MitraClip and Watchman (32.2 minutes vs 28 minutes, p=0.35 and 14 minutes vs 15.4 minutes, p=0.48).

CONCLUSION NRT results in a significant reduction in radiation dose while not significantly increasing total fluoroscopy time. Our results suggest that NRT should be considered by any structural intervention program looking to reduce procedural radiation.

Table 1. Procedural Fluoroscopy Time and Radiation Dose by Structural Heart Intervention

	Standard			NRT			Δ	
	n	Mean Time (min)	Mean Radiation Dose (Gy*cm2)	n	Mean Time (min)	Mean Radiation Dose (Gy*cm2)	Mean Time (min)	Mean Radiation Dose (Gy*cm2)
TAVR	461	23.5	246.8	70	17.1	57.8	-27.2% (p=0.0001)	-76.5% (p=0.0001)
MitraClip	114	32.3	199.3	11	28	86.7	-13.3% (p=0.34)	-56.4% (p=0.003)
Watchman	70	14	150.1	12	15.4	73.2	0.1% (p=0.48)	-51.2% (p=0.0008)