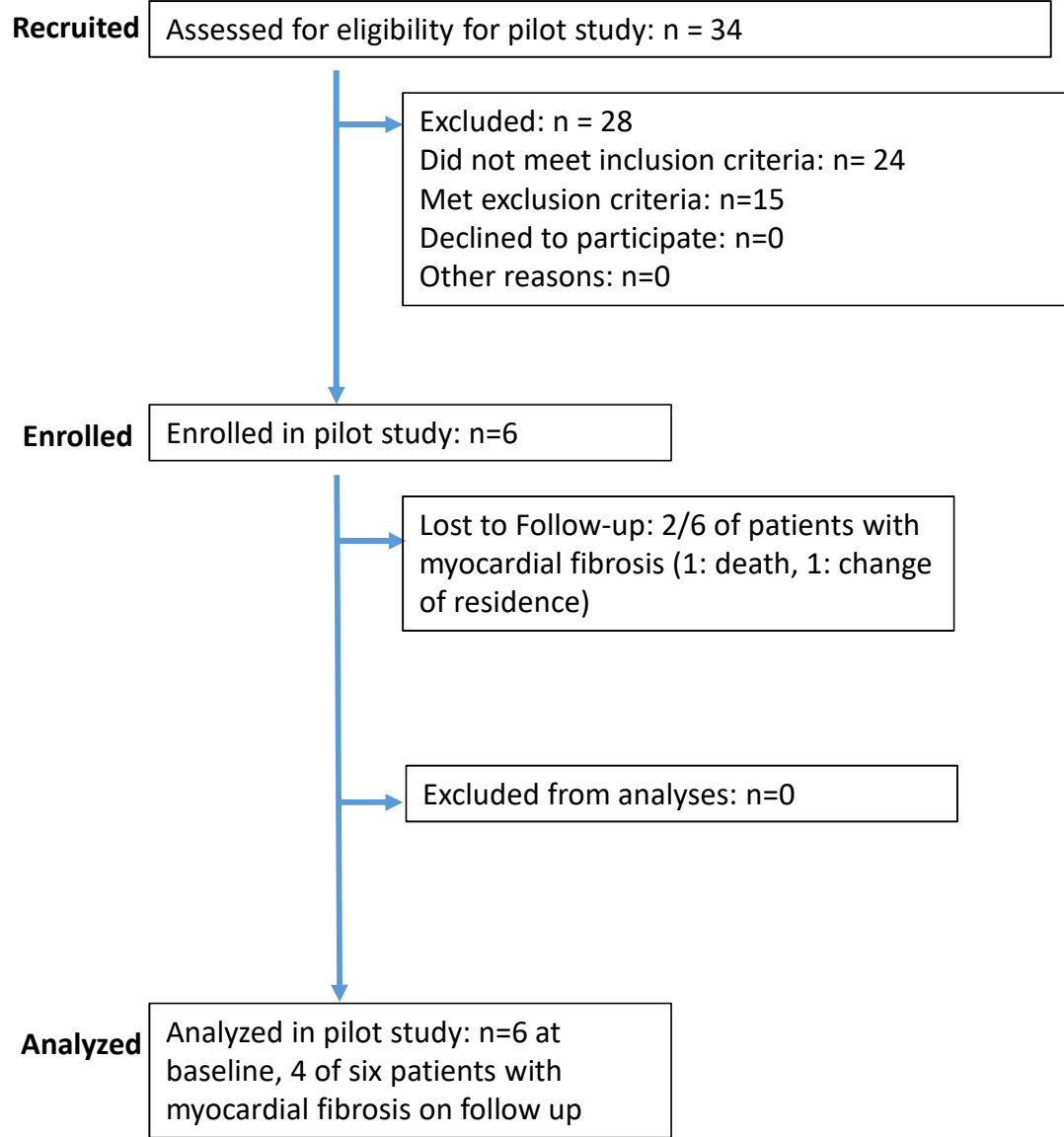
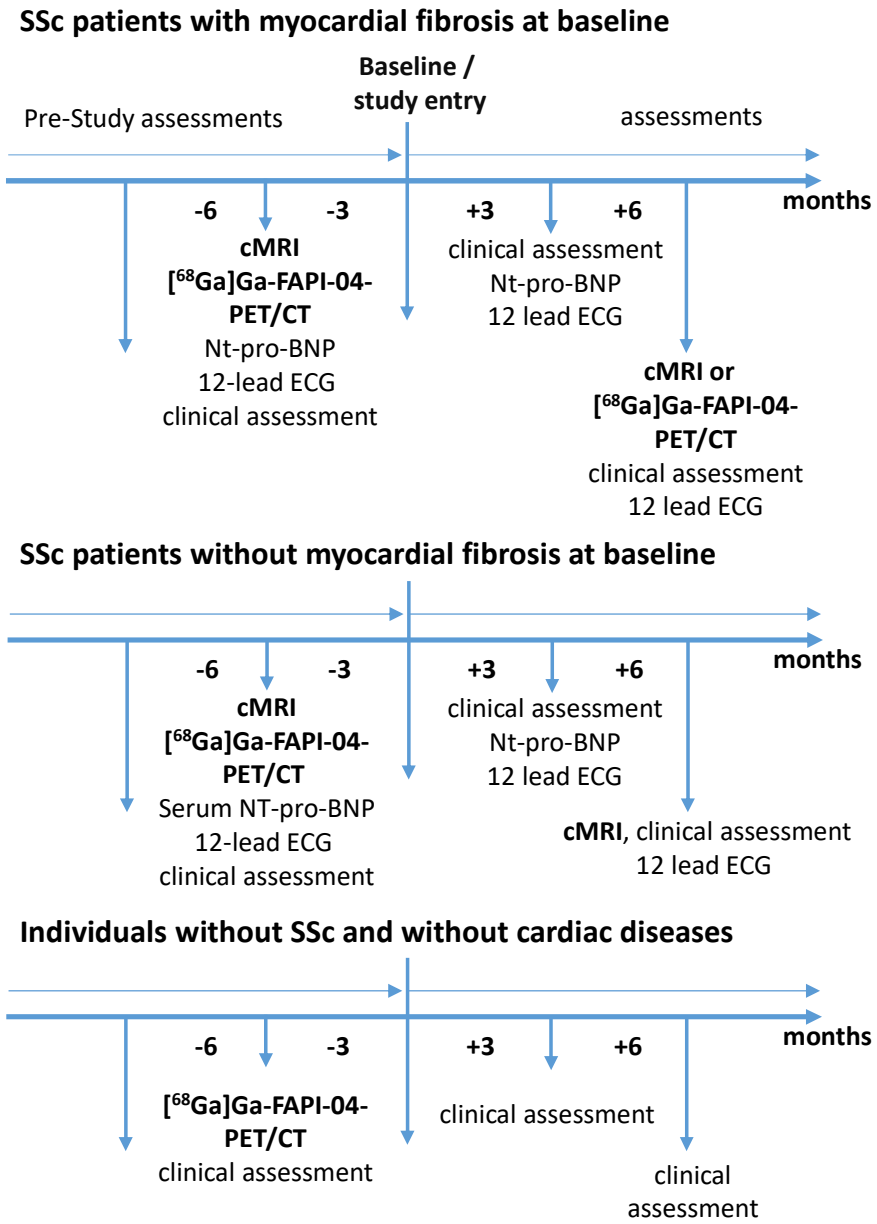
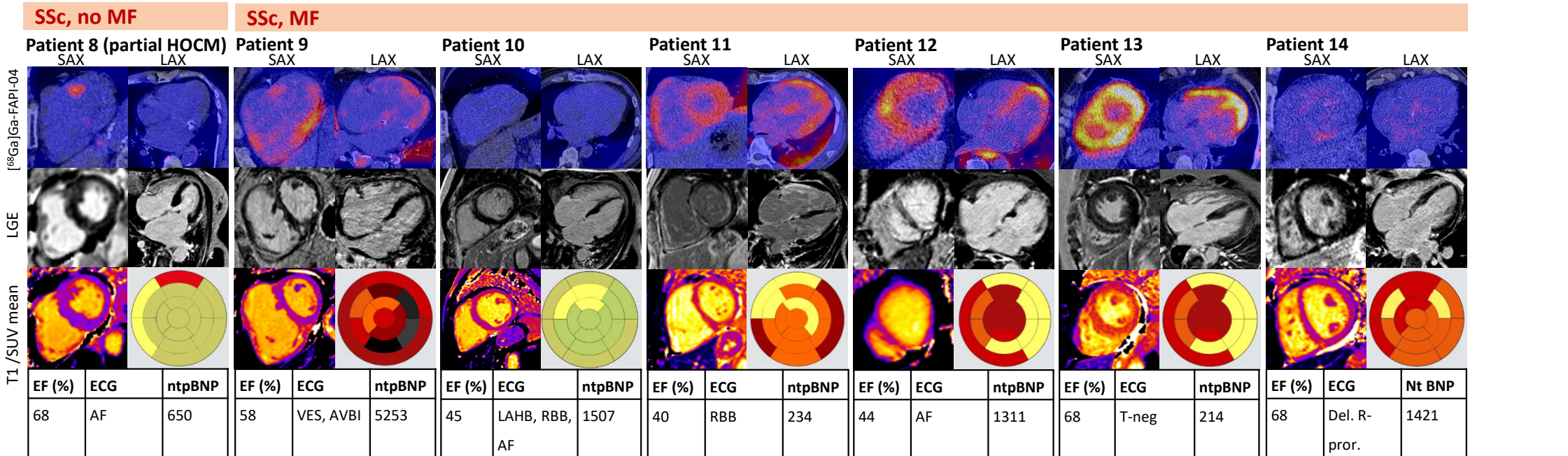
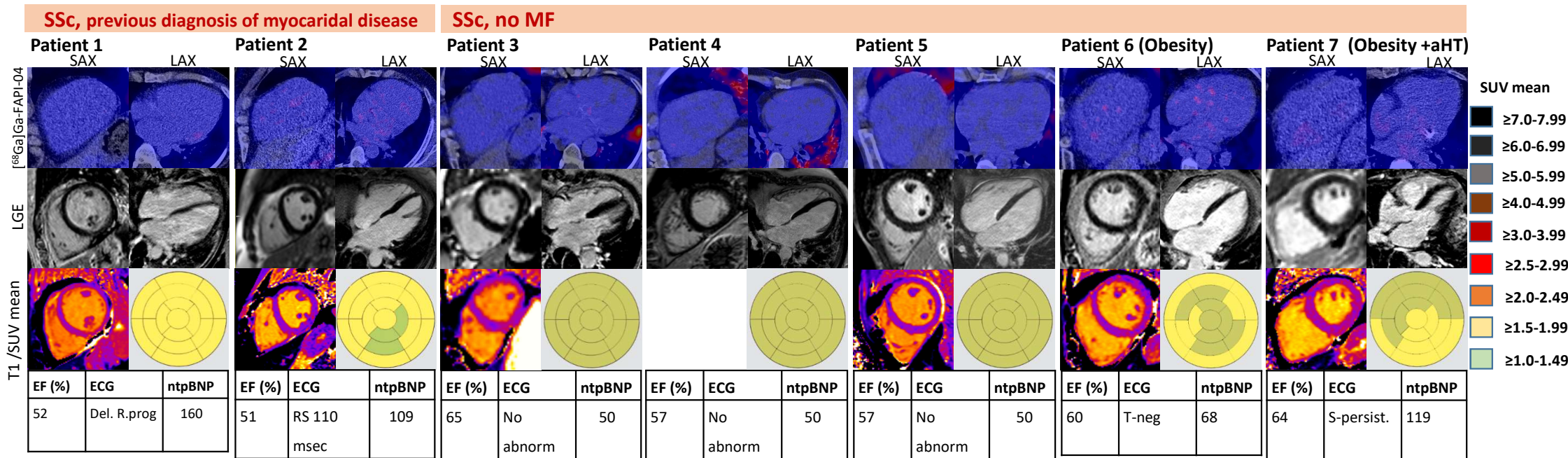


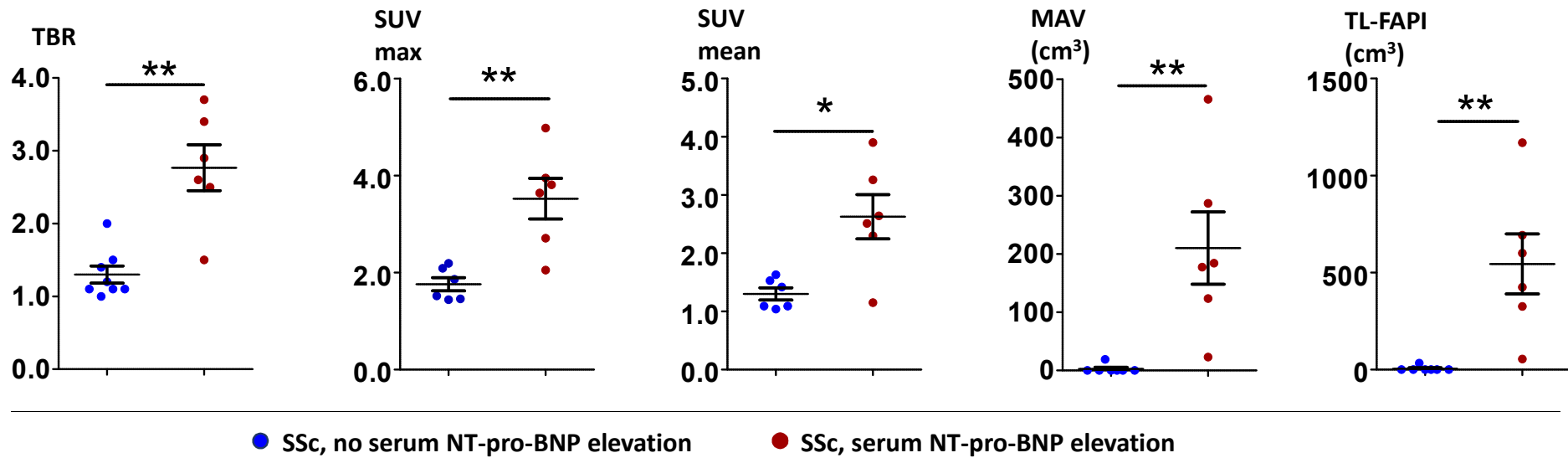
A**B**

Supplementary Figure 1: A Participant flow diagram. B Pictogramm of assessments included in the trial. cMRI: cardiac MRI, ECG: electrocardiogramm, Nt-pro-BNP: N-terminal-pro- brain natriuretic peptide. [⁶⁸Ga]Ga-FAPI-04: ⁶⁸Gallium-labeled Fibroblast Activation-Protein-Inhibitor-04, PET: positron-emission tomography, CT: computational tomography

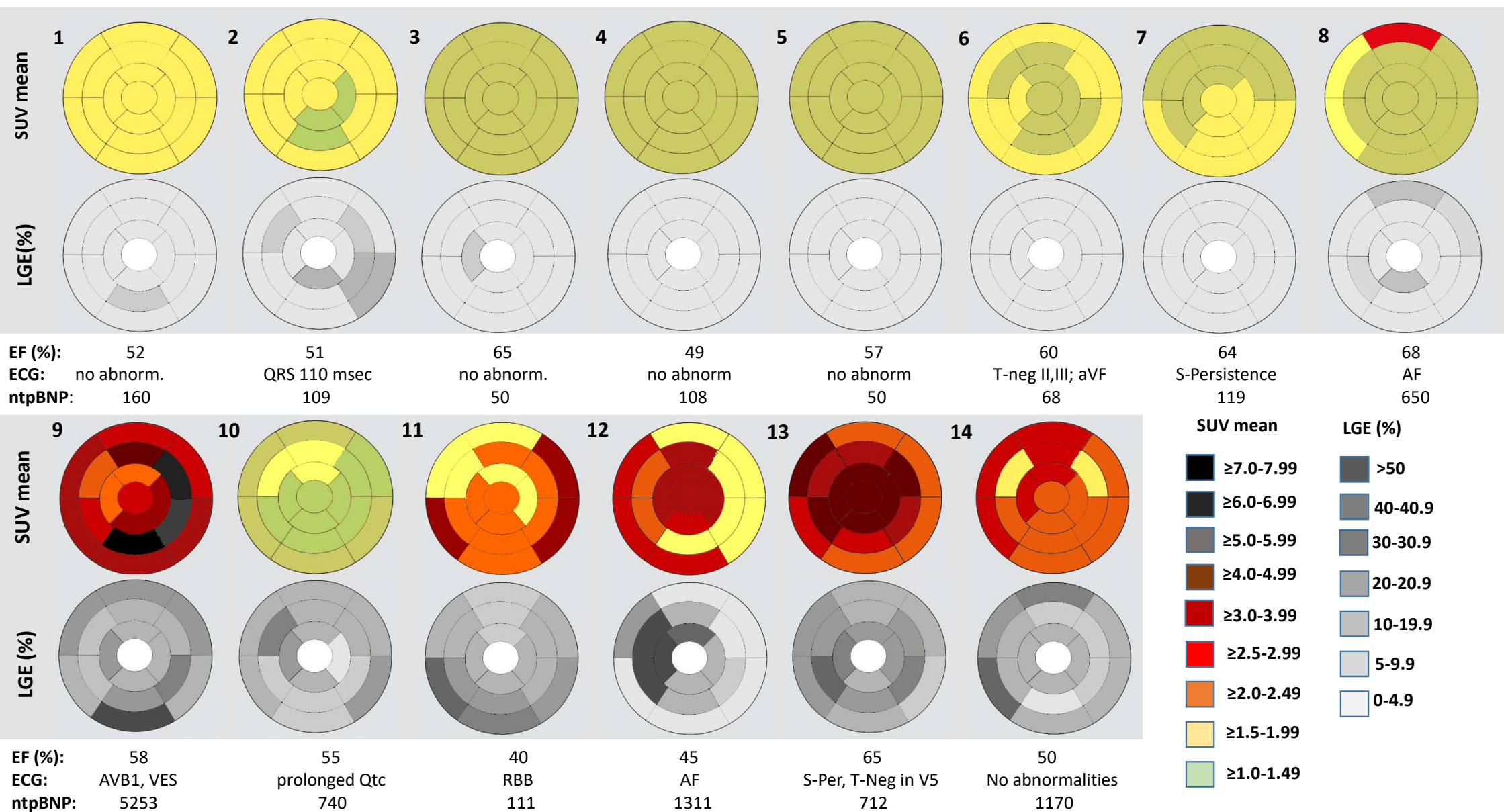


Supplementary Figure 2: Baseline investigations of all SSc-participants: ^{68}Ga -FAPI-04-PET/CT scan, late gadolinium enhancement (LGE), T1-mapping, SUV mean according to the 17-regions AHA-modell, clinical information: ejection fraction (MRI; EF, %), electrocardiogramm (ECG), nt-pro-BNP (ntpBNP, pg/ml). AHA: American heart Association, SAX: short axis-, LAX: long axis view.

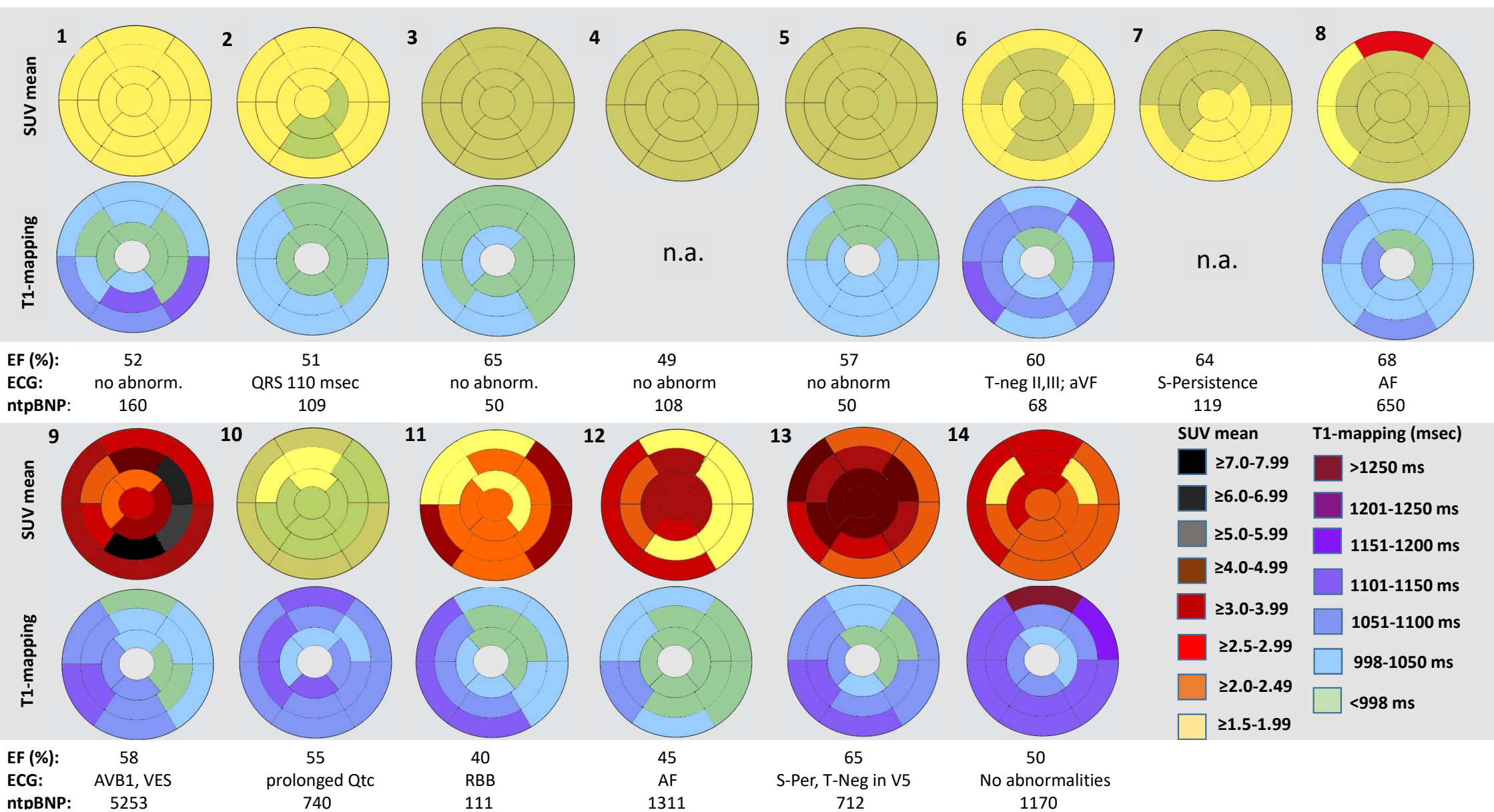
Serum NT-pro-BNP



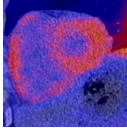
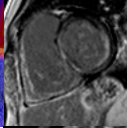
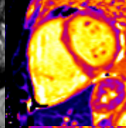
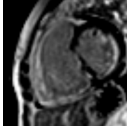
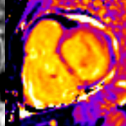
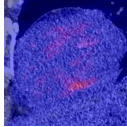
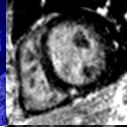
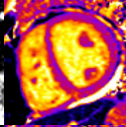
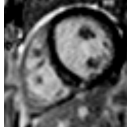
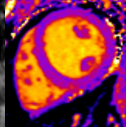
Supplementary Figure 3: [68Ga]Ga-FAPI-uptake values depending on the presence of elevation of serum NT pro BNP. Results are presented as median with interquartile range. *p<0.05; **p<0.01; ***p<0.001.



Supplementary Figure 4: Mapping of SUV mean values and LGE (%) to the 17 regions of the AHA-model in all SSC-participants (1-14) at baseline: The intensity of cMRI-based findings and ⁶⁸Ga-FAPI-04-uptake differ inter-individually arguing for different activity of the fibrotic remodeling process. EF: ejection fraction (%), ECG: electrocardiogram, Nt-pro-BNP (N-terminal-pro-BNP, pg/ml), AVB: atrioventricular block. VES: ventricular extrasystoles. LAHB: left anterior hemi block, RBB: right bundle block, AF: atrial fibrillation, S-Per: S-persistence, T-neg: negative T, R-progr: R-progression.



Supplementary Figure 5: Mapping of SUV mean values and T1-relaxation times to the 17 regions of the AHA-model in all SSc-participants (1-14) at baseline: The intensity of cMRI-based findings and ^{68}Ga -FAPI-04-uptake differ inter-individually arguing for different activity of the fibrotic remodeling process. EF: ejection fraction (%), ECG: electrocardiogram, Nt-pro-BNP (N-terminal-pro-BNP, pg/ml), AVB: atrioventricular block. VES: ventricular extrasystoles. LAHB: left anterior hemiblock, RBB: right bundle block, AF: atrial fibrillation, S-Per: S-persistence, T-neg: negative T, R-progr: R-progression.

	[⁶⁸ Ga]Ga-FAPI-04-PET/CT	LGE	T1-Mapping	[⁶⁸ Ga]Ga-FAPI-04 (MAV/TLFAP cm ³)	LGE (%)	T1 relax. Time (msec)	Nt-pro-BNP (pg/ml)	EF (%)	ECG abnormalities	
A	BL				SUV mean 2.1 MAV 286.0 TLFAP 600.6	18.4	1032	111	40	RBB
	FU					20.7	1054	277	20	RBB, accumulating VES
B	BL				SUV mean 2.3 MAV 21.0 TLFAP 54.7	15.8	1108	1170	50	No abnormalities
	FU					16.0	1041	301	57	No abnormalities

Supplementary Figure 6: Follow up observations of participants 11 and 14. Representative images of [⁶⁸Ga]-FAPI-04-PET/CT scan and the corresponding cMRI (LGE and T1) at baseline (BL) and the corresponding sections of the same modalities on follow up (FU) are shown. Clinical findings including serum Nt-pro-BNP levels, EF(%) and ECG findings are tabulated. **A:** Clinical progress on follow up despite therapy with nintedanib and MMF (Participant 11). **B:** Myocardial fibrosis on MRI and low ⁶⁸Ga-FAPI-04 uptake at BL and stable MRI and improved clinical parameters on FU (Participant 14). BL: baseline, FU: follow up, VES: ventricular extrasystoles, RBB: right bundle branch block, EF: ejection fraction.