# Automated Prediction of Atrial Fibrillation Risk on Stroke Unit Monitor

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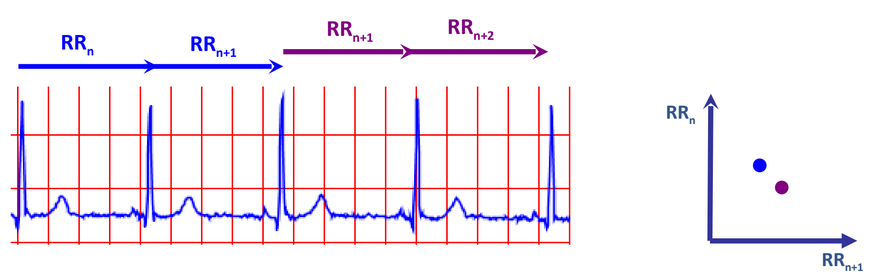
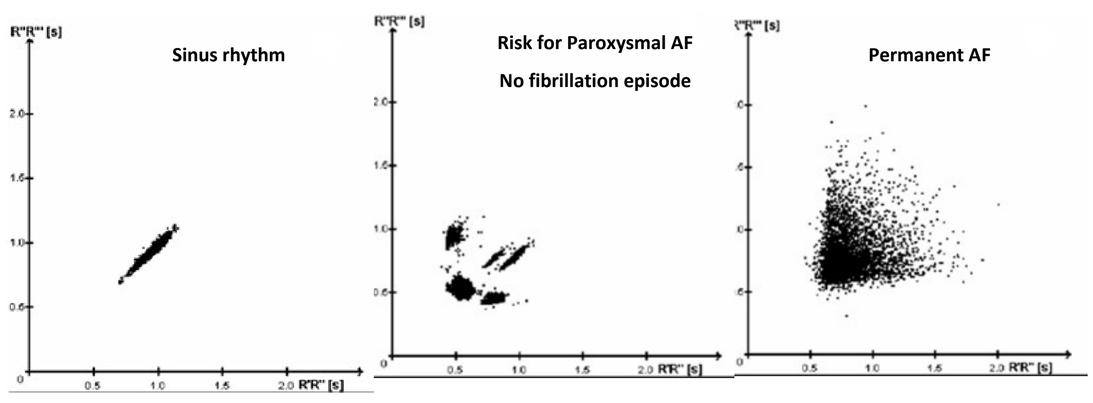
**Introduction:** Identification of Paroxysmal Atrial Fibrillation (PAF) in acute stroke patients leads to an increased use of anticoagulant treatment and a reduced risk for stroke recurrence. However, detection of PAF is often challenging even with Continuous Cardiac Monitoring (CCM) provided by Stroke Unit (SU) monitors. Stroke Risk Analysis (SRA) technology applied on patients at sinus rhythm is able to predict the risk for the subsequent development of PAF. In this study, we investigated the association between the SRA-calculated PAF risk profile with well-established clinical and instrumental predictors for PAF in acute stroke patients.

**Materials:** CCM tracks provided by conventional bedside SU monitors (Philips patients monitors, Central Station m3150) were extracted, anonymized and sent by the internet to SRA servers (Apoplex Medical Technologies, Pirmasens, Germany). SRA algorithm (www.apoplexmedical.com) detects QRS complexes to extract R-R-intervals. RR intervals are subsequently used to calculate different, mostly nonlinear, mathematical parameters to determine the PAF risk. An automated report is generated showing calculated SRA risk profile and a Lorenz plot for visual inspection of RR intervals dynamics.

**Methods**: We retrospectively enrolled acute stroke patients consecutively admitted in a single SU. Age, sex, stroke risk factors and admission NIHSS score were collected and CHA2DS2-VASc and HAS-BLEAD score calculated. All patients were investigated with standard ECG, carotid doppler, echocardiography and neuroimaging. CCM obtained by SU monitors within the initial 48 hours from hospital admission was automatically analyzed by SRA. SRA results were categorized into 3 risk levels: low risk for PAF, high risk, and presence of AF. A cardiologist, blinded to the study, independently reviewed all SRA reports as well as the ECGs to confirm or exclude AF. SRA score was finally compared with clinical and instrumental predictors for PAF.




**Results**: 85 patients were enrolled (mean age 70±16 years, 36% female). SRA identified 54 patients (63,6%) as low risk, 15 patients (17.6%) as at high risk and detected PAF/AF presence in 16 patients (18.8%). SRA score strongly correlated with age (p=0.001), history of hypertension (p=0.015), history of cardiac failure (p=0.032), elevated CHA2DS2-VASc score (p=0.000), elevated NIHSS score (p=0.026), prolonged QTc value (p=0.002) and left atrial diameter enlargement (p=0.012). There was an inverse correlation with hyperlipidemia (p=0.012). SRA score did not correlate with diabetes, current smoking, ventricular hypo/akinesia and carotid stenosis.

**Discussion**: 48 hours SRA risk score was significantly associated with established clinical and instrumental predictors for PAF 2-3 while not with those predicting atherosclerotic stroke. SRA might therefore be of help for an early automated identification of acute stroke patients at risk for PAF utilizing CCM already available on standard SU monitoring.

***References***

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