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## TO WHOM IT MAY CONCERN

### SUBJECT: Confirmation of Abstract Presentation at Euroanaesthesia 2023

The ESAIC hereby certifies that the following abstract was presented at Euroanaesthesia 2023 in Glasgow, 3 – 5 June 2023.

Please find below the abstract-related information – as submitted – including date and time of presentation:

<b>Presenter</b>	<b>Vidya Sriram</b>
Affiliation	National Institute of Mental Health and Neurosciences, Neuroanaesthesia and Neurocritical Care, Bangalore, India
First Author	Vidya Sriram
Co-authors	<u>V. Sriram</u> , V. Bhadrinarayan, K. Gopala, N. Shweta, C. Dhritiman
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Kind regards,

ESAIC Scientific Department  
European Society of Anaesthesiology  
and Intensive Care  
24 rue des Comédiens B-1000 Brussels | Belgium  
Tel: +32 2 210 57 72  
[abstracts@esaic.org](mailto:abstracts@esaic.org)  
[www.esaic.org](http://www.esaic.org)

# Prediction of success of spontaneous breathing trial and extubation using heart rate variability indices in patients admitted to neurosurgical intensive care unit

Authors: V. Sriram<sup>1</sup>, V. Bhadrinarayan<sup>1</sup>, N. Gopala Krishna<sup>1</sup>, N. Shweta<sup>1</sup>,C. Dhritiman<sup>1</sup>

<sup>1</sup>National institute of mental health and neurosciences, Neuroanaesthesia and neurocritical care, Bangalore, India



**Background :** One of the most challenging problems in ICU is weaning from mechanical ventilation . Cardiopulmonary stress can result in a failed weaning trial. Monitoring the autonomic nervous system provides information about the pathophysiological imbalance within the cardiovascular system.

**Goal:** assess the usefulness of heart rate variability indices to predict the success of spontaneous breathing trial and extubation .

**Materials and Methods :**This is a prospective observational study conducted on 54 intubated and mechanically ventilated neurosurgical patients in ICU over a period of 10 months.

Patients aged 18-65 years , mechanically ventilated for more than 48 hours were recruited.

Written informed consent was taken from legal surrogate.

Patients on rate controlling drugs, pregnancy ,low ejection fraction , who do not consent were excluded.

Decision for spontaneous breathing trial(SBT) taken by the treating intensivist SBT was attempted.

Parameters-**Heart rate(HR) ,Non invasive blood pressure(NIBP)**

**HRV indices-LF,HF,LF/HF,TINN,1/Rrtri ,Total power(TP),Autonomic dysfunction % ,(AD%)were recorded using DyAnsys ® devices the four timepoints.**

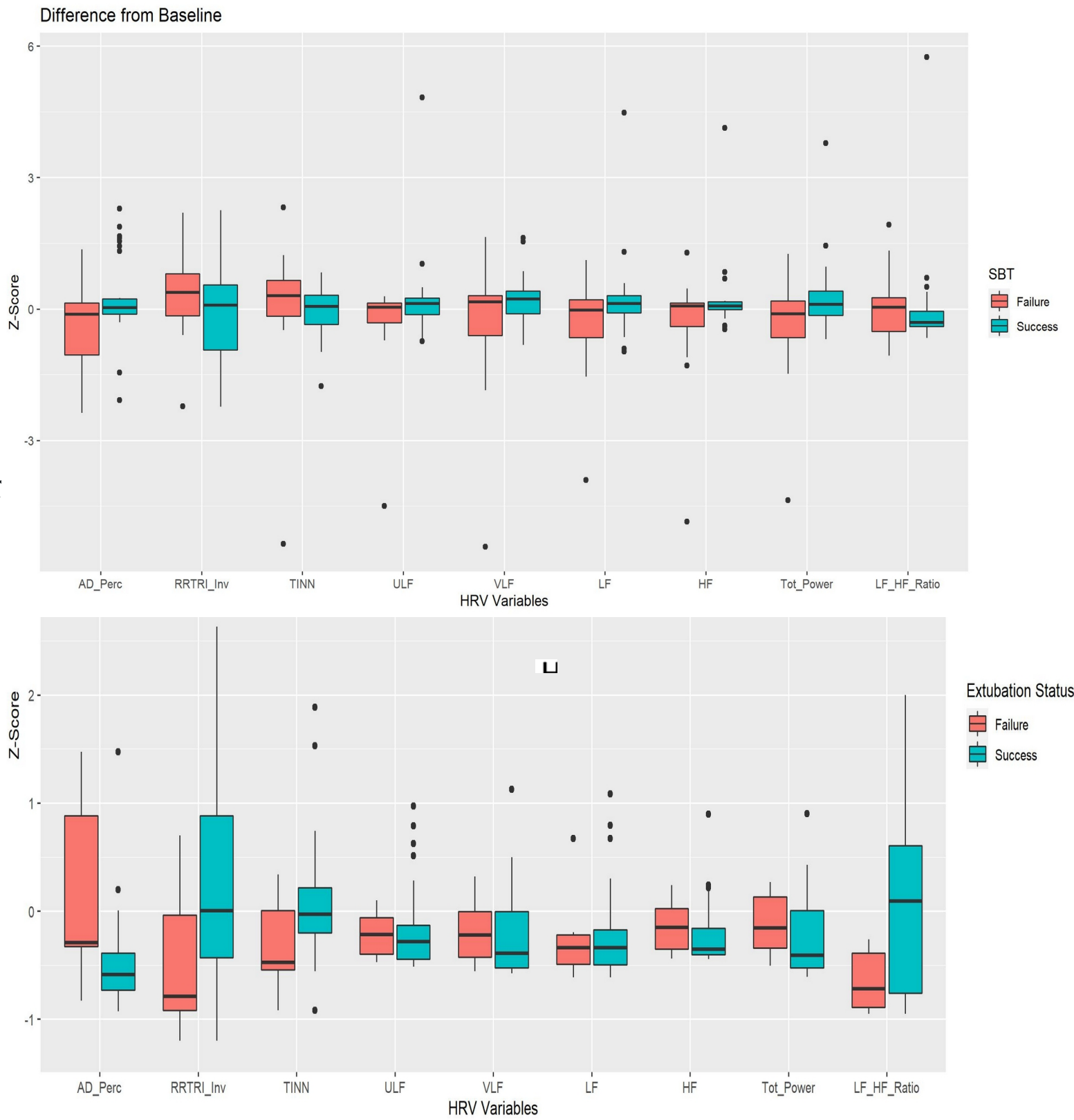
**Timepoints:**

T1-At 48 hours of mechanical ventilation

T2-At the beginning of the first planned SBT

T3-At the end of the first planned SBT

T4-24 hours prior to planned extubation



OUTCOME	VARIABLE	TIME POINT	CUT OFF	SPECIFICITY	SENSITIVITY	INFERENCE
SBT Status	Autonomic dysfunction%	T1	17.5	0.76	0.90	AD_Percentage>17.5% at baseline increases chances of failure of SBT
SBT Status	Total Power	T1	4444.5	0.60	0.74	Total Power > 4444.5 at Baseline increases chances of failure of SBT
SBT Status	(Baseline-PreSBT) Difference in autonomic dysfunction%	T1-T2	-5.5	0.47	0.94	AD_Percentage at PreSBT Increases > 5.5 compared to baseline, higher chances of failure
Extubation Status	Autonomic dysfunction%	T1	16.5	0.83	0.81	AD_Percentage>16.5% at baseline increases chances of failure

**Statistical analysis:** Data collated offline in Microsoft excel spreadsheet and analysed using r software. Interval scale variables were presented as medians and interquartile ranges. Analysis for primary objective was done by creation of binary Logistic Regression model. Results presented as odds ratios with confidence intervals. P value <0.05 were taken as statistically significant.

**Results and Discussion:**1)Of the total patients (n=54),31 patients passed the first planned SBT,23 patients failed the first SBT.

2)Out of the 31 patients who successfully passed the first SBT,28 were successfully extubated and 3 patients were reintubated within 48 hours.

3)HR,NIBP,LF,HF,LF/HF,TINN,I/RRtri were not statistically significant in predicting SBT or extubation.

4)However AD%(AD%>17.5%,p value=0.002,Sensitivity=90%),TP(TP>4444,p value=0.037,sensitivity=74%) at T1 could predict SBT failure.

5)Patients trending towards worsening of sympathetic function before initiation of SBT had chances of SBT failure (T2-T1 difference>5.5,p value=0.03,Sensitivity=94%)

6)Patients having early autonomic dysfunction(AD%>16.5%,p value=0.03,sensitivity=81%)at T1 had higher chances of extubation failure

**Conclusion:** Monitoring autonomic function is a simple ,repeatable, non-invasive and reproducible test in addition to the standard parameters to predict weaning and extubation in neurosurgical patients. It empowers the intensivist with adequate information to anticipate and formulate plans tailored for individual patients. A larger sample size is needed for in depth understanding of autonomic function in weaning and extubation.