

Supplemental Information

Rapid prediction of secondary neurologic decline after traumatic brain injury: a data analytic approach

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Supplemental Table 1: Heart rate variability features and their definitions

HRV Variable	Definition	Unit
Time domain		
Mean NN	Mean NN intervals	ms
SDNN	Standard deviation of NN intervals	ms
RMSSD	Root mean square of the sum of the squares of differences between adjacent NN intervals	ms
SDNN index	mean of the SDNN values of each 5-minute segment	ms
pNN50	Percentage of NN intervals that differences between adjacent NN intervals > 50ms	%
pNN20	Percentage of NN intervals that differences between adjacent NN intervals > 20ms	%
Frequency domain		
Total power	Spectral power of NN intervals 0-0.4Hz	ms ²
UVLF	Spectral power of NN intervals 0 – 0.003Hz	ms ²
VLF	Spectral power of NN intervals 0.003-0.04Hz	ms ²
LF	Spectral power of NN intervals 0.04-0.15Hz	ms ²
HF	Spectral power of NN intervals 0.15-0.4Hz	ms ²
LF/HF	Ratio of LF to HF power	
Nonlinear dynamics		
SD1	Standard deviation of the Poincare plot (PP) perpendicular to the line of identity	ms
SD2	SD of the PP along the line of identity	ms
SD2/SD1	Ratio of SD2 to SD1	
Alpha1	Short term fluctuation slope in detrended fluctuation analysis	
Alpha2	Long term fluctuation slope in detrended fluctuation analysis	
Ellipse area	Area of the ellipse fit of PP	

Heart rate variability (HRV) features were calculated both from electrocardiography (ECG) and photoplethysmography (PPG) waveforms and were calculated using three different methods, including Welch, Lomb, and autoregressive (AR).

Supplemental Table 2: Initial head computed tomography (CT) features of all included patients, n=905

Time to CT (hours)		0.85 [0.52, 1.25]
Abnormal CT		388 (42.8%)
Rotterdam Score		2 [2, 3]
Basal Cisterns	0 [normal]	720 (90.4%)
	1 [compressed]	46 (5.8%)
	2 [absent]	30 (3.8%)
Midline Shift	0 [< 5mm]	737 (92.6%)
	1 [≥5mm]	59 (7.4%)
Intraventricular or Subarachnoid Hemorrhage	0 [absent]	516 (64.8%)
	1 [present]	280 (35.2%)
Epidural Hematoma	1 [absent]	762 (95.7%)
	0 [present]	34 (4.3%)

Values are reported as either median (1st quartile, 3rd quartile) or as the number (percent of total)

Supplemental Figure 1: Receiver operating characteristic curve exploring neurologic decline model's ability to predict in-hospital mortality

