

SUPPLEMENTAL MATERIAL

Table S1. Characteristics of study cohort and excluded cases

	Study cohort	Excluded cases	P value
Total Cases, n	1072	644	
Patient Characteristics			
Female, n (%)	225 (21)	152 (24)	0.21
Age, median (IQR)	62 (52, 72)	64 (54, 75)	0.02
Cardiac etiology, n (%)	1023 (95)	571 (89)	< 0.01
Public Location, n (%)	370 (35)	206 (32)	0.29
Bystander CPR, n (%)	814 (76)	472 (73)	0.23
Resuscitation Process Variables			
EMS Response Time, min, median (IQR)	5.1 (4.0, 6.4)	5.0 (3, 6.7)	0.49
Interval between device power to ECG segment, s, median (IQR)	37 (20-60)		
Shocks delivered, median (IQR)	3 (1,6)	3 (1, 5)	0.09
Outcomes			
Sustained ROSC	799 (75)	428 (66)	< 0.01
Admit to hospital, n (%)	788 (74)	404 (63)	0.02
Survive to hospital discharge, n (%)	535 (50)	253 (39)	0.01
Neurologically intact survival (CPC 1 or 2), n (%)*	488 (46)	223 (35)	< 0.01

* Cerebral Performance Category (CPC) was missing for 5 patients in the study cohort.

Table S2. Adjusted associations between Utstein elements and VF waveform measures. VF waveform measures were log-transformed and standardized. 95% CI in parentheses.

Utstein element	VF waveform measure		
	AMSA	Peak Frequency	Median Peak Amplitude
Bystander CPR	0.40 (0.26, 0.53)	0.25 (0.11, 0.38)	0.32 (0.19, 0.46)
Female	0.13 (-0.016, 0.27)	0.24 (0.097, 0.39)	0.093 (-0.053, 0.24)
Public v. private location	0.19 (0.06, 0.31)	0.13 (0.004, 0.26)	0.16 (0.031, 0.29)
Cardiac	0.26 (-0.028, 0.54)	0.30 (-0.018, 0.59)	0.038 (-0.25, 0.32)
Age/10	-0.056 (-0.096, -0.015)	-0.063 (-0.10, -0.022)	-0.030 (-0.071, 0.012)
EMS response time	-0.034 (-0.062, -0.010)	-0.040 (-0.068, -0.012)	-0.041 (-0.070, -0.013)

AMSA = Amplitude Spectrum Area

Table S3. Adjusted and unadjusted odds ratios for predicting survival to hospital discharge with bystander CPR stratified as telephone CPR and unassisted CPR. The Utstein Model includes bystander CPR, sex, location, etiology, age, and EMS response time as predictor variables. The Mediation Models includes the Utstein variables plus a single VF measure. VF waveform measures were log-transformed and standardized. 95% CI in parentheses.

	Unadjusted	Utstein Model	Mediation Models		
			AMSA	Peak Frequency	Median Peak Amplitude
Utstein Elements					
Telephone CPR vs. no CPR	1.5 (1.1-2.1)	1.8 (1.3-2.5)	1.4 (0.98-2.0)	1.6 (1.1-2.2)	1.6 (1.1-2.2)
Unassisted CPR vs. no CPR	1.4 (1.0-1.9)	1.3 (0.89-1.8)	1.1 (0.75-1.6)	1.2 (0.82-1.7)	1.2 (0.82-1.7)
Female	1.4 (1.0-1.9)	1.4 (1.0-1.9)	1.3 (0.96-1.9)	1.2 (0.89-1.7)	1.4 (0.99-1.9)
Public v. private	1.4 (1.0-1.8)	1.2 (0.88-1.6)	1.0 (0.74-1.4)	1.1 (0.79-1.4)	1.1 (0.80-1.4)
Cardiac	1.8 (0.94-3.4)	2.8 (1.5-5.4)	2.7 (1.4-5.3)	2.5 (1.3-5.0)	2.9 (1.5-5.7)
Age/10	0.71 (0.65-0.78)	0.69 (0.62-0.75)	0.69 (0.62-0.76)	0.69 (0.62-0.76)	0.68 (0.61-0.75)
EMS response time	0.85 (0.79-0.90)	0.83 (0.78-0.89)	0.84 (0.79-0.90)	0.85 (0.79-0.90)	0.84 (0.79-0.90)
Ventricular fibrillation waveform measures					
AMSA	2.0 (1.7-2.3)		1.9 (1.7-2.2)		
Peak Frequency	2.0 (1.7-2.3)			1.8 (1.6-2.1)	
Mean Peak Amplitude	1.6 (1.4-1.8)				1.5 (1.3-1.7)

AMSA = Amplitude Spectrum Area