SUPPLEMENTAL MATERIAL

Data S1.

Supplemental Methods

Reasons for edit in CaseReview

A. LUCAS excluded

Mechanical CPR was performed. Identified by a steady rate of 101 or 103 compressions per minute. Period of LUCAS excluded from the last valid compression prior to activation of LUCAS

B. False start

The first CPR period is < 20 seconds of chest compressions or < 30 chest compressions followed by a CPR pause of > 90 seconds. The new first CPR period begins at the first sets of compressions outside the mentioned low cut-off.

C. Pause with compressions

An error caused by artefact/movement. The pattern is identified by a registration of chest compression pause in the chest compression fraction bar while chest compression depth bars indicate chest compression. Case edited from the last valid compression or pause.

D. No CPR

Cases that initially contained chest compressions but where the edition process removed all compressions, leaving the case without valid manual compressions or compression period are ≤ 20 seconds or < 30 chest compressions.

E. OK

The case has been reviewed, or editing of the case is complete, and the case is valid.

F. Corrected error

The case has been manually edited, and an error has been corrected

Table S1. Significance level with adjustments.

Analysis	Semi adjusted*	Fully adjusted [†]	Unadjusted [‡]
Variable		*Probability*	
CCD (cm), median (IQR)	0.88	0.76	0.85
CCDiT (%), median (IQR)	< 0.001	< 0.001	< 0.001
CCR (compressions per minute), median (IQR)	< 0.001	< 0.001	< 0.001
CCRiT (%), median (IQR)	< 0.001	< 0.001	< 0.001
CCF (%), median (IQR)	< 0.001	< 0.001	< 0.001
CCiT (%), median (IQR)	< 0.001	< 0.001	< 0.001

adjusted for bystander CPR, [†] adjusted for (all variables), [‡] no adjustment from manus table 2

Outcome descriptives significance with adjustments

CCD: chest compression depth, CCDiT: chest compression depth in target, CCF: chest compression fraction, CCiT: compressions in target, cm: centimetre, CCR: chest compression rate, CCRiT: chest compression rate in target, IQR: interquartile range.

Table S2. Baseline characteristics (with statistical comparison).

Out-of-hospital cardiac arrest characteristics

Variable / Phase	No feedback	Real-time feedback	Total	Missing values, n (%)	P
N, (%)	467 (51.2)	446 (48.9)	913 (100)	-	
Age years, median (IQR)	74.0 (62.0-83.0)	74.5 (63.0-82.0)	74.0 (63.0-82.0)	0	0.52
Sex – male, n (%)	305 (65.3)	282 (63.9)	589 (64.5)	0	0.61
Location – private*, n (%)	378 (80.9)	342 (76.9)	720 (78.9)	0	0.12
First EMS recorded rhythm – shockable, n (%)	81 (17.8)	77 (17.6)	158 (17.7)	22 (2.4)	0.93
Witnessed by bystander, n (%)	218 (46.7)	228 (51.1)	446 (48.9)	0	0.18
Bystander CPR, n (%)	332 (71.1)	289 (64.9)	621 (68.1)	1 (< 1)	0.047
Bystander defibrillation, n (%)	49 (10.5)	43 (9.6)	92 (10.1)	0	0.67
Witnessed by EMS, n (%)	43 (9.2)	46 (10.3)	89 (9.8)	0	0.57
EMS defibrillation, n (%)	129 (27.6)	121 (27.1)	250 (27.4)	0	0.87
EMS response time, minutes (sd)	7.4 (5.9)	7.3 (4.8)	7.4 (5.4)	28 (3.1)	

*Location was classified as either private or public

Baseline characteristics of patients with out-of-hospital cardiac arrest included in the study (with statistical comparison)

CPR: cardio-pulmonary-resuscitation, EMS: emergency medical services, sd: standard deviation.
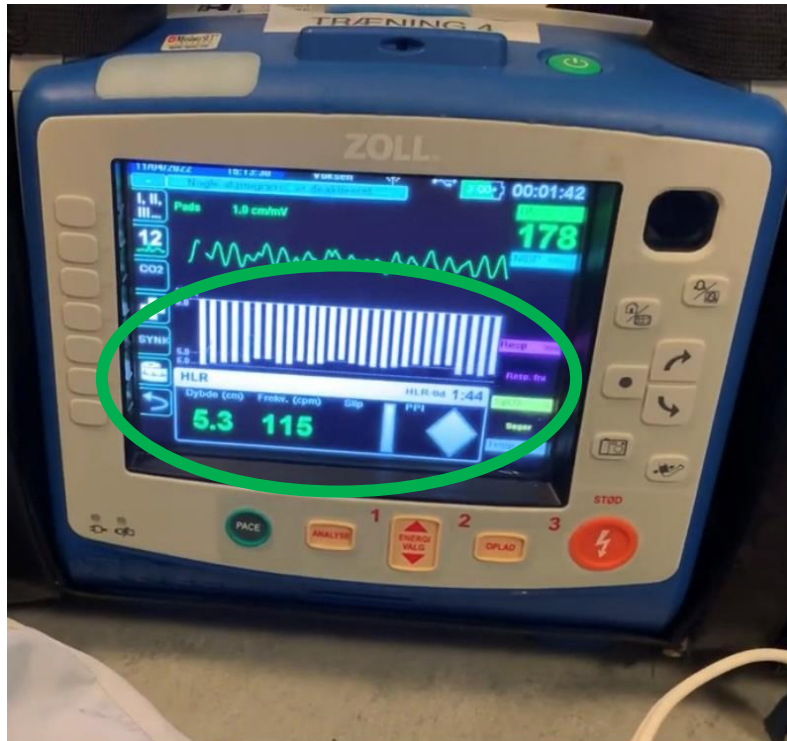
Significance level with adjustments

Analysis	Semi adjusted*	Fully adjusted [†]	Unadjusted [‡]
Variable		*Probability*	
CCD (cm), median (IQR)	0.88	0.76	= 0.85
CCDiT (%), median (IQR)	< 0.001	< 0.001	< 0.001
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CCRiT (%), median (IQR)	< 0.001	< 0.001	< 0.001
CCF (%), median (IQR)	< 0.001	< 0.001	< 0.001
CCiT (%), median (IQR)	< 0.001	< 0.001	< 0.001

adjusted for bystander CPR, [†] adjusted for (all variables), [‡] no adjustment from manus table 2

Outcome descriptives significance with adjustments

CCD: chest compression depth, CCDiT: chest compression depth in target, CCF: chest compression fraction, CCiT: compressions in target, cm: centimetre, CCR: chest compression rate, CCRiT: chest compression rate in target, IQR: interquartile range.
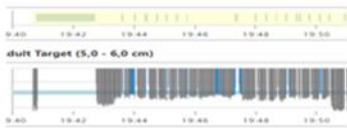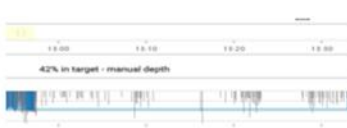
Figure S1. Feedback dashboard.

Chest compression feedback dashboard (in green circle) by Zoll® X-series® defibrillator

Figure S2. Reviewing procedure and editing of data.

Algorithm for review of CPR quality data

Step	Action	Visual presentation	Definition	Tag	Validation
1	Check for LUCAS pattern		Continuous compressions at rate 101 or 103/min	LUCAS	Crosschecked by PPJ registrations
2	Check for false CPR start		Start of CPR by less than 20 sec / 30 compressions followed by a pause of > 90 sec	False CPR start	No objective validation possible
3	Check for compressions during registered pauses		Irregular compression pattern seen during a registered CPR pause period	Pause with compression	If possible crosschecked by PPJ registrations
4	Check for other irregular patterns		Any pattern deviations from 30:2 or 10:1 not explained by step 1-3	Abnormal case	No objective validation possible
5	End review of case		Option 1: no need for edit Option 2: Need for edit	1: OK 2: Data error	No applicable

Algorithm for editing of CPR quality data

Step	Action	Definition	Tag	Validation
1	Edit LUCAS pattern	Continuous compressions at rate 101 or 103/min	LUCAS removed	Crosschecked by PPJ registrations
2	Edit false CPR start	Start of CPR by less than 20 sec / 30 compressions followed by a pause of > 90 sec	False CPR start removed	No objective validation possible
3	Remove periods with compressions during registered pauses	Irregular compression pattern seen during a registered CPR pause period	Pause with compression removed	If possible crosschecked by PPJ registrations
4	Investigate and edit other irregular patterns registered	Any pattern deviations from 30:2 or 10:1 not explained by step 1-3	Tags 1-3	No objective validation possible
5	Check for length of CPR after edit	If no compressions or less than 20 sec / 30 compressions	No CPR	No applicable
6	End review of case	Remove "data error" tag Add: "Data error corrected" + "OK"	"Data error corrected" "OK"	No applicable

CPR: cardio-pulmonary-resuscitation, LUCAS: Lund University Cardiopulmonary Assist System, PPJ: Prehospital Patient Journal (report form)