HERZZENTRUM LEIPZIG

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ECLS-SHOCK

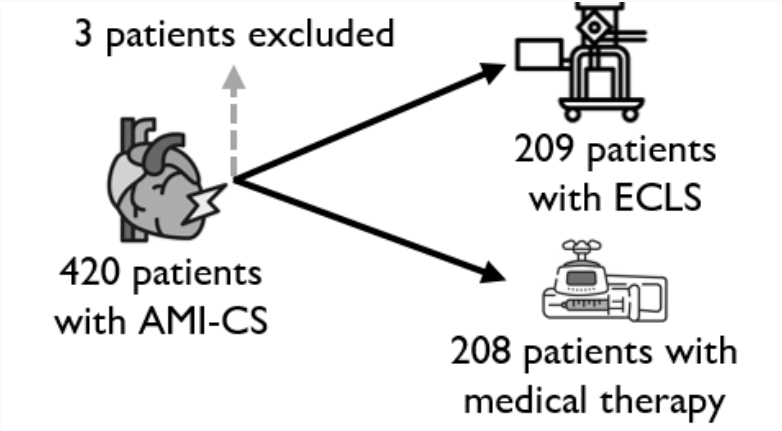
Extracorporeal Life Support in Infarct-Related Cardiogenic Shock

1-Year Results of the ECLS-SHOCK Trial

Steffen Desch on behalf of the ECLS-SHOCK Investigators

September 2, 2024

ECLS-SHOCK Design



Inclusion Criteria	Exclusion Criteria
• Cardiogenic shock complicating AMI (STEMI or NSTEMI) plus obligatory: 1. Planned revascularization 2. SBP <90 mmHg >30 min or catecholamines required to maintain SBP >90 mmHg 3. Signs of impaired organ perfusion with at least one of the following criteria: ➢ Altered mental status ➢ Cold, clammy skin and extremities ➢ Oliguria with urine output <30 ml/h 4. Arterial lactate >3 mmol/l • Informed consent	• Resuscitation >45 minutes • Mechanical cause of cardiogenic shock • Onset of shock >12 h • Severe peripheral artery disease with impossibility to insert ECLS cannulae • Age <18 years or >80 years • Shock of other cause (bradycardia, sepsis, hypovolemia, etc.) • Other severe concomitant disease with limited life expectancy <6 months • Pregnancy • Participation in another trial

44 study sites

Thiele, Zeymer, ..., Desch, Freund. NEJM 2023; 389:1286-1297

Baseline Characteristics

	ECLS (n=209)	Control (n=208)
Age (years); median (IQR)	62 (56 - 69)	63 (57 - 71)
Male sex; n/total (%)	170/209 (81.3)	169/208 (81.3)
Mean blood pressure (mmHg); median (IQR)	71 (61 - 87)	72 (60 - 88)
STEMI; n/total (%)	135/204 (66.2)	141/207 (68.1)
Resuscitation before randomization; n/total (%)	162/209 (77.5)	162/208 (77.9)
No. of diseased vessels; n/total (%)		
1	71/203 (35.0)	63/200 (31.5)
2	71/203 (35.0)	53/200 (26.5)
3	61/203 (30.0)	84/200 (42.0)
LVEF (%); median (IQR)	30 (20 - 35)	30 (20 - 40)
Laboratory values on admission		
pH; median (IQR)	7.2 (7.1 - 7.3)	7.2 (7.1 - 7.3)
Lactate (mmol/L); median (IQR)	6.8 (4.5 – 9.6)	6.9 (4.6 – 10.0)
SCAI Shock classification; n/total (%)		
C	104/209 (49.8)	111/208 (53.4)
D	38/209 (18.2)	18/208 (8.7)
E	67/209 (32.1)	79/208 (38.0)

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Treatment

	ECLS (n=209)	Control (n=208)
Type of inital revascularization; n/total (%)		
PCI	199/208 (95.7)	199/204 (97.5)
CABG	1/208 (0.5)	0/204
PCI with emergent transfer to CABG	2/208 (1.0)	0/204
ECLS therapy; n/total (%)	192/209 (91.8)	26/208 (12.5)
Initiation in catheterization laboratory		
Prior revascularization	42/192 (21.9)	4/26 (15.4)
During revascularization	50/192 (26.0)	8/26 (30.8)
After revascularization	100/192 (52.1)	7/26 (26.9)
Initiation after catheterization laboratory		
<24 hours	0/192	3/26 (11.5)
≥24 hours	0/192	4/26 (15.4)
Duration of ECLS therapy (days); median (IQR)	2.7 (1.5 - 4.8)	2.7 (2.2 – 3.8)
Peripheral antegrade perfusion sheath; n/total (%)	183/192 (95.3)	16/19 (84.2)
Active left ventricular unloading in ECLS; n/total (%)	11/191 (5.8)	6/19 (31.6)
Other MCS in patients without ECLS; n/total (%)	0/17	28/182 (15.4)
Invasive mechanical ventilation; n/total (%)	183/203 (90.1)	177/202 (87.6)

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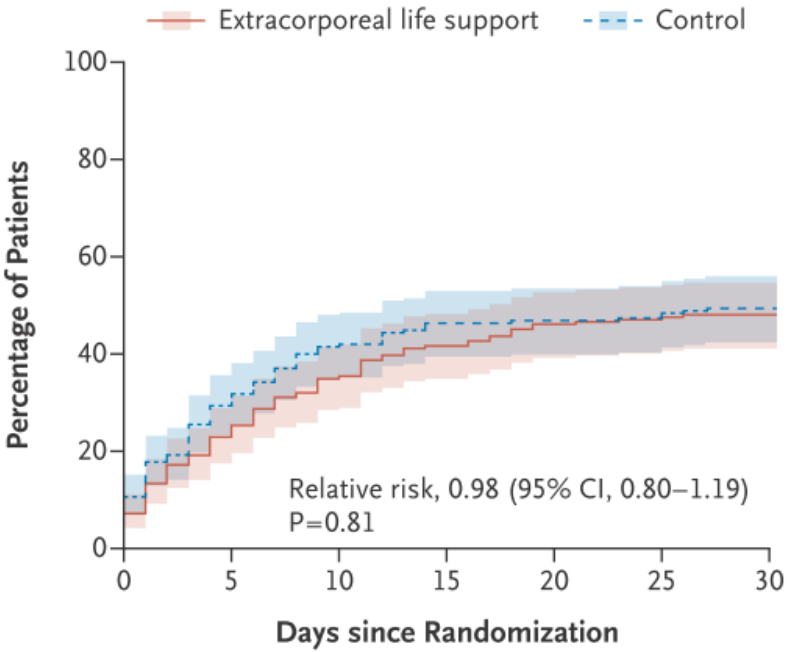
Primary Endpoint – 30-Day Mortality



No. at Risk

Control	208	146	120	109	105	104	100
Extracorporeal life support	209	161	136	119	109	107	105

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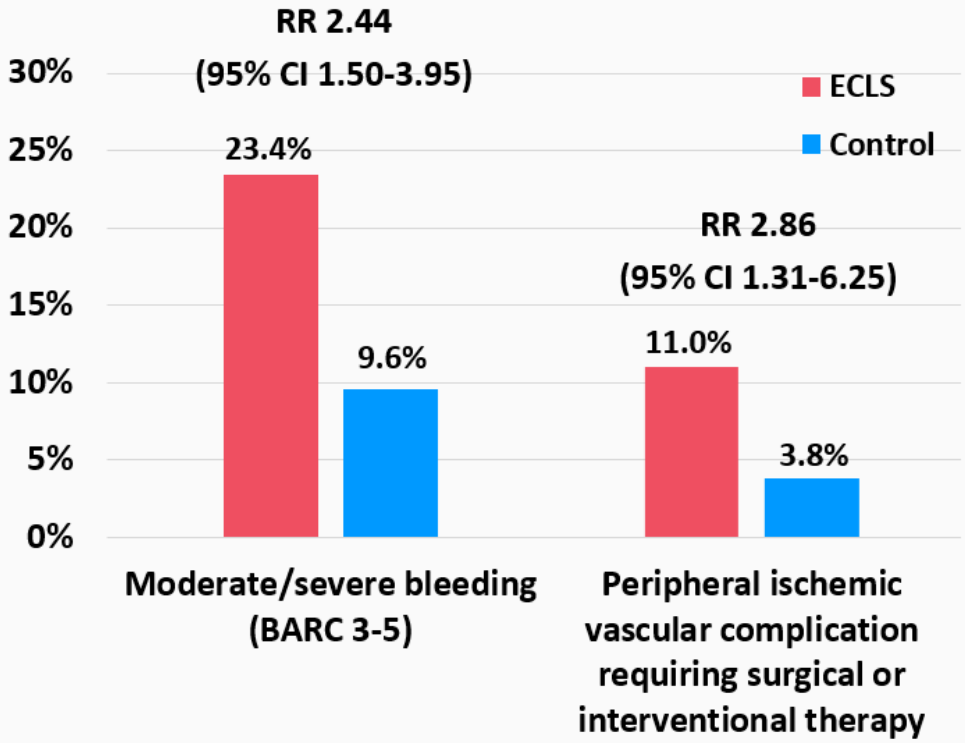
Safety



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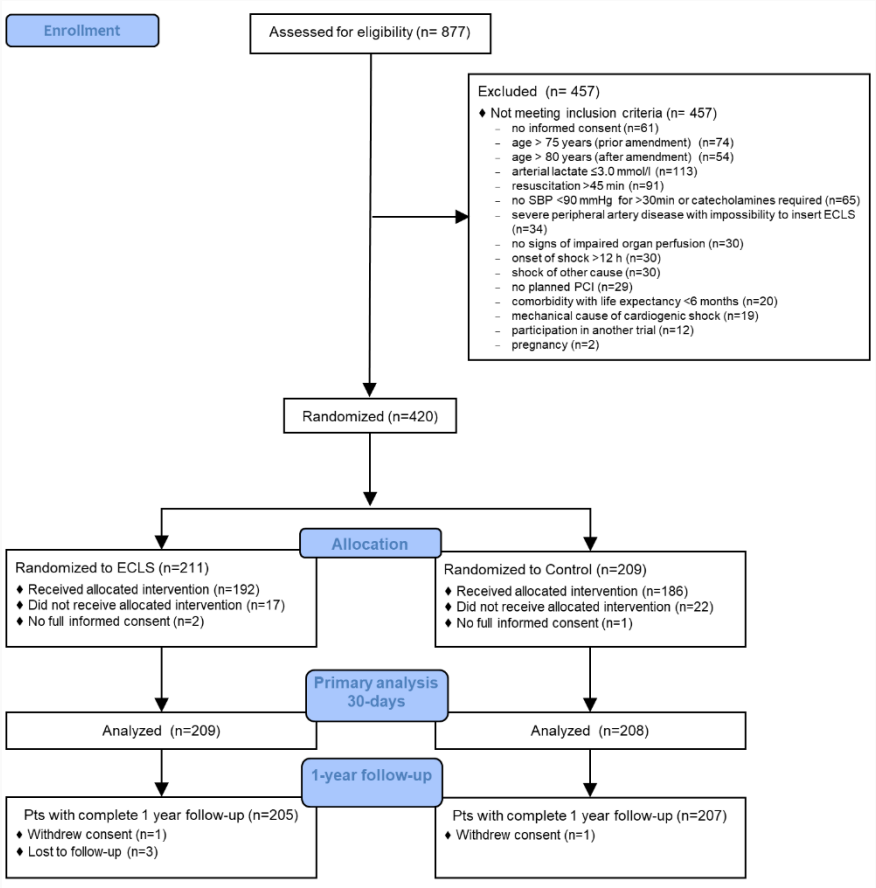
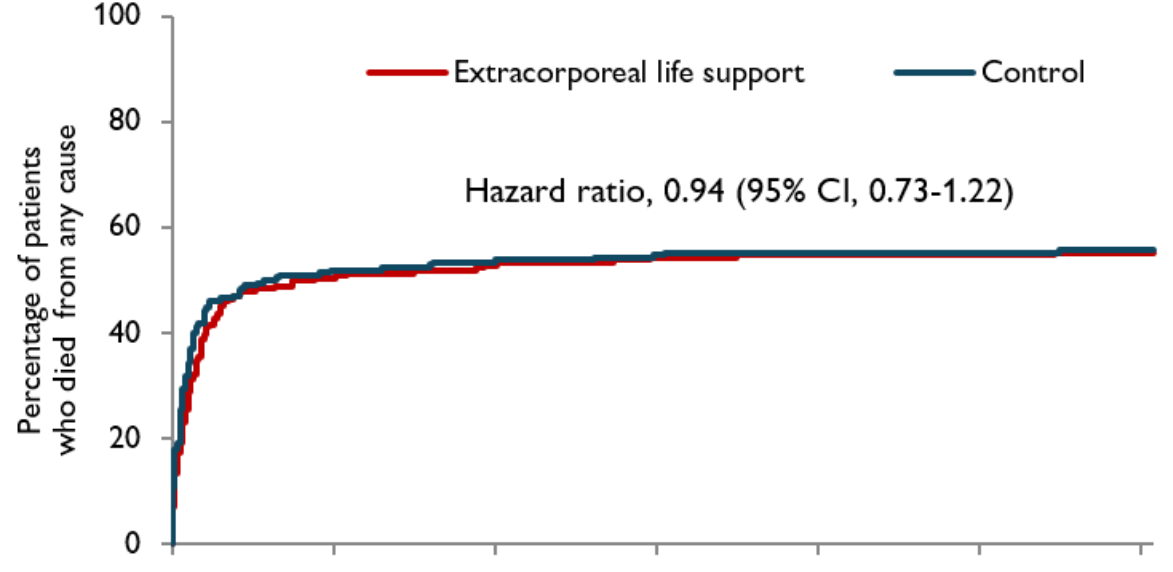
1-Year Flowchart



All-Cause Mortality Throughout 1 Year



Number at risk

Control	208	100	97	94	92	92	67
ECLS	209	101	96	93	91	91	71

Subgroups @1-Year

Subgroups	Death from Any Cause at 1 year		Hazard Ratio (95% CI)	P Value for Interaction
	Extracorporeal Life Support	Control		
	No. of patients with event/total no. of patients (%)			
Sex				
Male	93/170 (54.7%)	90/169 (53.3%)	0.99 (0.74-1.32)	0.34
Female	22/39 (56.4%)	26/39 (66.7%)	0.79 (0.45-1.40)	
Age				
< 65 year	56/124 (45.2%)	50/112 (44.6%)	1.03 (0.70-1.51)	0.98
≥ 65 year	59/85 (69.4%)	66/96 (68.8%)	0.91 (0.64-1.30)	
Diabetes				
No	67/138 (48.6%)	72/146 (49.3%)	0.94 (0.67-1.31)	0.69
Yes	47/70 (67.1%)	43/60 (71.7%)	0.88 (0.58-1.33)	
Type of infarction				
NSTEMI	44/69 (63.8%)	40/66 (60.6%)	0.99 (0.65-1.52)	0.53
STEMI	67/135 (49.6%)	75/141 (53.2%)	0.90 (0.64-1.24)	
STEMI type				
Anterior infarction	38/75 (50.7%)	45/85 (52.9%)	0.94 (0.61-1.45)	0.75
Non-anterior infarction	28/59 (47.5%)	30/56 (53.6%)	0.81 (0.48-1.36)	
Arterial lactate				
≤ 6 mmol/liter	34/87 (39.1%)	29/85 (34.1%)	1.21 (0.74-1.99)	0.34
> 6 mmol/liter	79/120 (65.8%)	84/120 (70.0%)	0.84 (0.62-1.14)	
CPR				
No	24/47 (51.1%)	28/46 (60.9%)	0.73 (0.42-1.25)	0.32
Yes	91/162 (56.2%)	88/162 (54.3%)	1.02 (0.76-1.36)	

Additional Endpoints @1-Year

ECLS-SHOCK

	ECLS	Control	OR (95% CI)
Myocardial reinfarction	2.2% (2/90)	2.2% (2/91)	1.01 (0.14-7.34)
Cardiovascular mortality	30.7% (63/205)	32.9% (68/207)	0.91 (0.60-1.37)
Repeat reascularization	18.9% (17/90)	19.8% (18/91)	0.94 (0.45-1.98)
Rehospitalization for heart failure	17.8% (16/90)	14.3% (13/91)	1.30 (0.58-2.88)
Poor neurological outcome (CPC 3 and 4), survivors only	3.5% (3/86)	7.0% (6/86)	0.48 (0.12-1.99)

All endpoints other than cardiovascular mortality are presented in 1-year survivors only.

Quality of Life in Survivors @1-Year

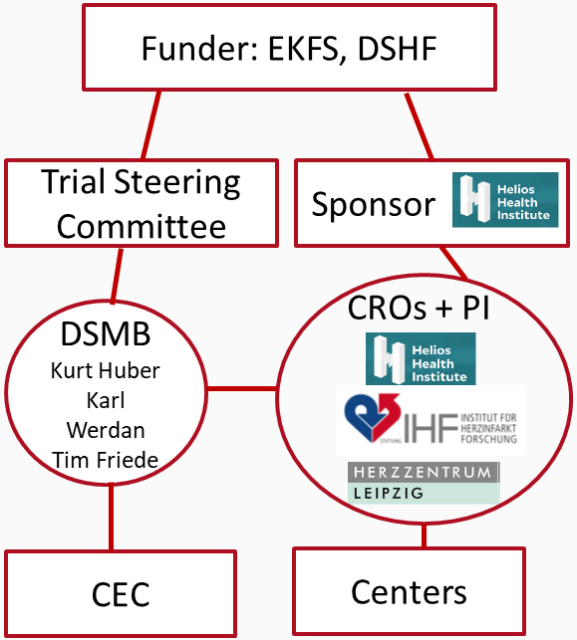
	ECLS	Control	P value
Mobility			
No problems	63.5 % (54/85)	77.1 % (64/83)	0.062
Some problems	31.8 % (27/85)	19.3 % (16/83)	
Confined to bed	4.7 % (4/85)	3.6 % (3/83)	
Self-Care			
No problems	75.3 % (64/85)	85.5 % (71/83)	0.15
Some problems	21.2 % (18/85)	7.2 % (6/83)	
Unable to wash or dress	3.5 % (3/85)	7.2 % (6/83)	
Usual activities			
No problems	60.0 % (51/85)	71.1 % (59/83)	0.15
Some problems	29.4 % (25/85)	20.5 % (17/83)	
Unable to perform usual activities	10.6 % (9/85)	8.4 % (7/83)	
Pain/Discomfort			
No pain or discomfort	61.4 % (51/83)	79.3 % (65/82)	0.013
Moderate pain or discomfort	31.3 % (26/83)	17.1 % (14/82)	
Extreme pain or discomfort	7.2 % (6/83)	3.7 % (3/82)	
Anxiety/Depression			
Not anxious or depressed	67.5 % (56/83)	78.0 % (64/82)	0.13
Moderately anxious or depressed	28.9 % (24/83)	19.5 % (16/82)	
Extremely anxious or depressed	3.6 % (3/83)	2.4 % (2/82)	

Take Home

At 1-year follow-up, routine early ECLS therapy does not provide clinical benefit compared to optimal medical therapy alone in patients with severe infarct-related cardiogenic shock.

Soon to be published in the European Heart Journal!

Acknowledgments and Thank You



Our greatest thanks go to the patients and relatives.

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