Congress abstracts

ECPR Prague School, Cubex Centrum Prague, October 16–18, 2025

BEYOND VALVULOPLASTY: ECPR AND ECMO SUPPORT IN A NEONATE WITH CORONARY ANOMALY

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Form: poster, **theme:** all aspects of ECPR

Case presentation: A term male neonate was delivered by emergency caesarean section due to fetal distress, with complications including meconium-stained liquor and a triple nuchal cord. The antenatal period was otherwise uneventful. Following birth, the infant experienced persistent hypoxia, necessitating intubation and initiation of prostaglandin infusion for suspected duct-dependent systemic circulation. Initial echocardiography at the referring center indicated critical aortic stenosis.
Interventions and ECPR: Upon transfer to a tertiary center, comprehensive echocardiography confirmed the diagnosis of critical aortic valve stenosis, revealing poor left ventricular function, moderate mitral regurgitation, and suspected compromised coronary flow. Despite urgent interventions, including balloon atrial septostomy followed by balloon aortic valvuloplasty, the infant's condition deteriorated, culminating in cardiac arrest. Resuscitation efforts continued for 33 minutes before the initiation of extracorporeal cardiopulmonary resuscitation (ECPR).
ECMO course and complications: While on extracorporeal membrane oxygenation (ECMO), serial echocardiograms demonstrated severe biventricular dysfunction and abnormal flow in the left anterior descending (LAD) coronary artery. Electrocardiography revealed ischemic ST changes, raising concerns for a coronary anomaly. Neurological complications developed swiftly, with EEG confirmed seizures on ECMO day 1 and extensive cerebral infarction identified by CT scan on ECMO day 2, following the onset of anisocoria. Investigations into metabolic and genetic causes were initiated and are ongoing.
Outcome and clinical decision making: Given the extent of irreversible myocardial and neurological injury, a multidisciplinary team made the decision to withdraw life-sustaining therapy.
Discussion: This case highlights the challenges of managing neonatal cardiac failure when coronary abnormalities complicate critical aortic stenosis. In such settings, ECPR and ECMO may provide rescue but often serve only as temporary support when irreversible ischemia exists. Emerging reports describe percutaneous coronary stenting in infants and young children, including left main lesions, with variable but sometimes durable outcomes.[1–3] Broader experience suggests that coronary interventions are feasible in congenital heart disease and postoperative settings.[4] The recent FDA approval of a pediatric-specific coronary stent represents an important advance,[5] though its safety and efficacy in unstable neonates remain uncertain. Early recognition of coronary involvement, timely imaging, and multidisciplinary evaluation are crucial for guiding management and counselling families. As technology evolves, coronary stenting may become a reliable treatment option even in the neonatal population.

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INTERMEDIATE–HIGH RISK SADDLE PULMONARY EMBOLISM WITH RIGHT VENTRICULAR SHOCK PHYSIOLOGY IN HYPEROSMOLAR HYPERGLYCEMIC STATE: ECHO-GUIDED RESUSCITATION AND THROMBOLYSIS IN A YOUNG ADULT

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Form: poster, **theme:** all aspects of cardiogenic shock

Background: Risk stratification and hemodynamic management of intermediate–high risk pulmonary embolism (PE) are complicated when a hyperosmolar hyperglycemic state (HHS) coexists. HHS often favors liberal fluids, whereas

acute right ventricular (RV) afterload mismatch is preload-sensitive, risking RV failure with indiscriminate resuscitation. Echocardiography (ECHO) – including TAPSE, tissue Doppler S′, TRV/RVSP (PASP surrogate), and PAAT/60-60 sign – is pivotal to guide fluids, vasopressors, and reperfusion.

Case: A 25-year-old male (BMI 34.7), sedentary delivery driver, with poorly controlled diabetes (off therapy ~5 years; HbA_{1c} 10.8%), presented with sudden pleuritic chest pain, dyspnea, and collapse without loss of consciousness. Pre-hospital SpO_2 81%; ED RR 30/min, HR 130/min, BP 87/57 mmHg, cool peripheries, S1Q3T3 on ECG. Metabolic profile: glucose ~30 mmol/L, pH 7.02, HCO_3 13 mmol/L, anion gap 24, β-hydroxybutyrate 0.40 mmol/L, lactate 13 mmol/L – consistent with predominant HHS. CTPA showed saddle PE with bilateral extension and PA/Ao >1. Initial ECHO: mild RV dilatation, severely reduced RV function (RV free-wall GLS –13%), TAPSE 1.2 cm, TRV 2.8–3.4 m/s, RVSP ~41 mmHg. The PERT team administered half-dose alteplase 50 mg, followed by heparin and transition to DOAC. Insulin infusion was started; fluids were titrated in 250–500 mL aliquots with serial ECHO and IVC assessment. At 24 h, ECHO improved: TAPSE 1.5 cm, RVSP ~48 mmHg, moderately reduced RV function. Oxygen was weaned to 2 L NC with SpO_2 99%. ECMO was available as a rescue but not required.

Discussion: This case underscores the RV cardiogenic-shock physiology in intermediate–high risk PE and the tension between HHS fluid needs and RV preload sensitivity. ECHO-centric guidance (TAPSE/S/S′ decline, rising RVSP/TRV, RV dilatation; when obtained, PAAT <60 ms and 60/60 sign favor acute PE) supports conservative fluid titration and early norepinephrine if MAP <65. Half-dose systemic thrombolysis balanced hemodynamic benefit and bleeding risk; DOAC dosing was adjusted for hemoptysis. CDT/thrombectomy and ECMO remain escalation options in refractory shock.

Conclusion: In young patients with intermediate–high risk PE and HHS, an ECHO-guided, physiology-based strategy – cautious fluids, timely pressors, and selected half-dose thrombolysis – can restore RV-pulmonary coupling and achieve rapid stabilization while mitigating bleeding and RV decompensation. Routine integration of TAPSE, S′, RVSP/PASP, and PAAT/60-60 should inform resuscitation and reperfusion decisions.

VENOARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION AS A BRIDGING STRATEGY IN REFRACTORY METFORMIN-ASSOCIATED LACTIC ACIDOSIS WITH MULTIORGAN FAILURE: A CASE HIGHLIGHTING CRITICAL CARE IMPLICATIONS

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Form: poster, **theme:** all aspects of mechanical support and extracorporeal therapies

Metformin-associated lactic acidosis (MALA) is a rare but life-threatening complication in diabetic patients, often triggered by acute kidney injury (AKI) and sepsis, leading to profound metabolic derangement and shock, with high mortality in severe cases, necessitating advanced interventions. This case report highlights venoarterial extracorporeal membrane oxygenation (VA ECMO) as a bridge in a 47-year-old male with type 2 diabetes on chronic metformin, presenting with five days of fever, gastrointestinal symptoms, and respiratory distress.

Initial findings included severe hypoxemia, tachycardia, and metabolic acidosis (unrecordable pH, lactate 17 mmol/L, bicarbonate unrecordable), with AKI (creatinine 1140 µmol/L, urea 28.7 mmol/L), leukocytosis, and elevated cardiac biomarkers. Electrocardiogram and echocardiography suggested stress cardiomyopathy. Despite fluid resuscitation, bicarbonate infusion, antibiotics, and noninvasive ventilation, deterioration required intubation, proning, and multiple vasopressors. Intravenous cyanocobalamin (5 g) was administered for refractory vasoplegia. Continuous renal replacement therapy (CRRT) attempts caused hypotension, prompting VA ECMO cannulation (right femoral vein drainage, left femoral artery return) on day 1. This stabilized hemodynamics, enabling CRRT resumption.

By day 3, lactate decreased to 2.8 mmol/L, creatinine to 250 µmol/L, and vasopressor needs reduced, with improved urine output and oxygenation. Literature supports ECMO in severe MALA: in overdose cases with extreme metformin levels, ECMO facilitated recovery by restoring perfusion and enabling toxin clearance. This case underscores ECMO's role in bridging refractory shock, augmented by cyanocobalamin for vasoplegia, allowing RRT and recovery in high-mortality MALA. Broader implications include early ECMO consideration in similar presentations, balancing risks like bleeding against life-saving support. This report advocates for ECMO integration in guidelines for severe metabolic crises, warranting further studies to refine selection criteria and optimize outcomes.

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ECPR IN OUT-OF-HOSPITAL CARDIAC ARREST IN PEDIATRICS: SHOULD I MAKE THE CALL? CASE REVIEW

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Form: poster, **theme:** all aspects of ECPR

Background: Extracorporeal cardiopulmonary resuscitation (ECPR) has been proposed as a salvage therapy in refractory cardiac arrest. While in-hospital ECPR is supported by growing evidence, its role in out-of-hospital cardiac arrest (OHCA) in children remains uncertain. Prolonged low-flow times and delayed cannulation frequently translate into dismal outcomes.
Objective: To present two pediatric OHCA cases in which ECPR was considered, and to discuss prognostic implications, ethical concerns, and the potential role of organ donation.
Case review: Case 1: An 8-year-old girl with a history of asthma experienced anaphylactic shock following accidental ingestion of kiwi. She sustained OHCA with a total arrest time of ~80 minutes prior to cannulation consideration. On arrival, she had fixed, dilated pupils. Brain death was declared within the first 24 hours. She became an organ donor (kidneys and corneas).
Case 2: A 23-month-old boy suffered OHCA after drowning in a private swimming pool during summer. Arrest time was approximately 90 minutes. Hypothermia (<32 °C) prompted consideration of ECPR, but fixed dilated pupils were present on admission. Brain death was declared within 24 hours, and organ donation was declined by the family.
Discussion: Both cases highlight the extremely poor prognosis of pediatric OHCA with prolonged low-flow times, even when ECPR is available. Fixed dilated pupils on admission proved to be a reliable indicator of futility, as neither patient survived beyond 24 hours. Although survival and meaningful neurological recovery were unattainable, one case resulted in successful organ donation, underlining an additional dimension in decision-making.
Conclusions: Pediatric OHCA with prolonged arrest times and fixed pupils on admission carries an almost universally fatal prognosis, questioning the utility of ECPR in these scenarios. In our review, profound hypothermia did not modify the neurological outcome, as brain death occurred within 24 hours despite consideration of ECPR. While hypothermia is sometimes viewed as a potential protective factor, its presence in cases with prolonged low-flow and severe neurological injury may not confer meaningful benefit. Careful neurological assessment at presentation should therefore remain central to decision-making, with a balanced consideration of futility and the potential role of organ donation.

PEDIATRIC ECPR: IS A PROGRAM WITHOUT A 24/7 ON-SITE CANNULATION TEAM FEASIBLE?

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Form: poster, **theme:** all aspects of ECPR

Introduction: Extracorporeal cardiopulmonary resuscitation (ECPR) represents a salvage therapy in refractory cardiac arrest. CPR duration is a key determinant of survival and neurological outcome. As cannulation response time may vary depending on team availability, it has been suggested that clinical outcomes could differ according to the time of day. This study aimed to compare survival and neurological outcomes in patients undergoing ECPR during "in hours", with an on-site cannulation team (OS, 08.00–15.00), versus "out of hours", with an on-call team (OC).
Methods and results: We performed a retrospective descriptive study including all pediatric ECPR cases managed at a tertiary center between 2012 and 2025. Cases were stratified according to cannulation team availability (cardiothoracic surgeon and perfusionist on-site vs. on-call). Demographic data, underlying conditions, ECPR duration, immediate outcomes (hospital survival), and long-term outcomes (neurological status, PCPC score) were collected.
Thirty-six pediatric ECPR cases were identified, of which 27/36 (75%) occurred during OS coverage. Baseline characteristics, comorbidities, and initial clinical parameters were comparable between groups. Median ECPR duration was significantly shorter in the OS group (18 min [IQR 28.5]) compared with the OC group (50 min [IQR 27], $p = 0.048$). Nevertheless, hospital survival did not differ significantly (OS 59.2% [16/27] vs. OC 66.7% [6/9]), nor did favorable neurological outcome at discharge (PCPC ≤2: OS 81.3% [13/16] vs. OC 66.7% [4/6]).
Conclusions: The presence of an on-site cannulation team significantly reduces ECPR duration. However, in our cohort, this reduction did not translate into improved survival or neurological outcomes. Further investigation is warranted to elucidate the higher incidence of ECPR during on-site hours and whether this reflects underutilization during on-call periods. These findings also underscore substantial room for improvement in reducing response times during out of hours ECPR.

FULL NEUROLOGICAL RECOVERY AFTER PROLONGED HYPOXEMIA SUPPORTED BY ECMO: A PEDIATRIC AND ADULT CASE SERIES

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Form: poster, **theme:** all aspects of mechanical support and extracorporeal therapies

Background: Prolonged hypoxia is linked to irreversible neurological injury and poor prognosis. Extracorporeal membrane oxygenation (ECMO) can sustain gas exchange and circulation when conventional therapies fail. While survival is increasingly reported, full neurological

recovery after severe and sustained hypoxemia remains exceptional.

Cases: Case 1: A 13-year-old boy presented with severe necrotizing pneumonia caused by Panton-Valentine leucocidin-positive MRSA. His course was complicated by ARDS, shock and multi-organ dysfunction. After hours of SpO_2 70–75% and PaO_2 under 40 mmHg despite maximal support, ECMO was escalated from VA to V-VA and eventually VV configuration, maintained for 43 days. He was successfully decannulated. Remarkably, he demonstrated full neurological recovery, contradicting early imaging of hypoxic brain injury.

Case 2: A 24-year-old male experienced near-drowning, followed by over two hours of refractory hypoxia (SpO_2 60–70%, pH 6.93, $PaCO_2$ >110 mmHg). VV-ECMO was initiated within 20 minutes of decision-making. He was decannulated after 14 days and discharged with full neurological recovery, despite early radiological evidence of cerebral edema.

Discussion: These cases challenge traditional prognostic expectations in prolonged hypoxia. Both pediatric and adult patients recovered fully despite extreme acidosis, hypercapnia, and radiological findings suggestive of brain injury, in both cases, survival with intact neurological function occurred despite hypoxemia of a severity and duration generally considered incompatible with favorable neurological outcome. Early recognition, multidisciplinary collaboration, dynamic ECMO strategies, and meticulous complication management were pivotal to success.

Conclusion: Prolonged hypoxia should not automatically preclude aggressive intervention. With timely ECMO initiation, complete neurological recovery is achievable. These findings emphasize the critical role of ECMO in both pediatric and adult populations, urging clinicians to reconsider conventional thresholds for futility.

MECHANICAL CIRCULATORY SUPPORT AS BRIDGE TO HEART TRANSPLANTATION IN CRITICALLY ILL CHILDREN: TWO CHALLENGING CASES

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Form: poster, **theme:** all aspects of mechanical support and extracorporeal therapies

Background: The use of mechanical circulatory support (MCS) including extracorporeal membrane oxygenation (ECMO) and ventricular assist devices (VADs) has become a vital component of bridging pediatric patients with end-stage heart failure to heart transplantation (HTx). Here, we present two pediatric cases successfully bridged to HTx through the use of MCS, highlighting the critical role of timely intervention and multidisciplinary care in achieving favorable outcomes.

First case: A 6-year-old, 25-kg boy with dilated cardiomyopathy was placed on veno-arterial ECMO. Left ventricular unloading was achieved by advancing a drainage cannula from the right subclavian artery into the left ventricle. Due to incomplete left ventricular unloading and persistent biventricular failure, LVAD (left ventricle to aorta) and an oxyRVAD (right atrium to pulmonary artery) were initiated on day 5 with Rotaflow centrifugal pumps. This configuration was maintained for 8 days until HTx (cold ischemic time 320 min; donor: 23-year-old female). Intraoperative primary graft dysfunction (PGD) required 4 days of V-A ECMO. CRRT was used for 10 days due to acute kidney injury (AKI). On postoperative day 3, the patient developed a hemorrhagic stroke and underwent tracheostomy. He remained in the ICU for 23 days and was discharged after 41 days, following successful neurological rehabilitation.

Second case: A 12-year-old girl (weight: 33 kg) with a known diagnosis of dilated cardiomyopathy was admitted to our center for evaluation and listing for heart transplantation. After admission the patient had experienced three episodes of cardiac arrest, requiring advanced resuscitation measures. Due to refractory heart failure and repeated life-threatening arrhythmias, LVAD support was initiated using the EXCOR® Active system with a 30 ml pump. After 6 hours of LVAD, an orthotopic HTx was performed (cold ischemic time 125 min; donor: 4-year-old child, 21 kg; donor-recipient size match: 64%). PGD developed within the first 8 hours postoperatively, requiring V-A ECMO support for 4 days. AKI necessitated CRRT for 9 days. The patient was transferred to the ward on postoperative day 17 and is currently in hospital rehabilitation.

Conclusion: These two cases highlight that even under the challenging conditions of wartime, where healthcare infrastructure is strained, resources are limited, and logistics are often disrupted, timely initiation of extracorporeal life support despite constrained availability of devices can be life-saving. In such settings, where clinical improvisation becomes a necessity and standard treatment protocols may need to be adapted, successful outcomes are still achievable. This is possible through well-coordinated, multidisciplinary teamwork, rapid decision-making, and the unwavering commitment of medical personnel working under extraordinary circumstances.

ECPR FOR ISOBUTYL NITRITE (POPPERS) INHALATION

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Form: poster, **theme:** all aspects of ECPR

Introduction: For decades, people have recreationally inhaled alkyl nitrite analogues known as "poppers". These rapid-onset, short-acting vasodilators cause the user to experience euphoria, dizziness, tachycardia and flushing. Nitrites rarely lead to acute life-threatening side effects such as ventricular dysrhythmias.[1]
Case report: A 40-year-old male had accidental exposure to isobutyl nitrite at his workplace following which he became unconscious and was brought to our hospital where he was found to be in ventricular fibrillation initially and CPR was performed as per ACLS protocol requiring 3 defibrillations and return of spontaneous circulation was achieved after 30 minutes. Post CPR clinical condition was s/o methemoglobinemia due to SaO_2-SpO_2 gap. The patient was immediately treated with 2 mg/kg of methylene blue and was shifted to ICU. 2D echocardiography was suggestive of severe LV systolic dysfunction (EF ~30–35%). In ICU the patient again had multiple episodes of ventricular tachycardia requiring cardioversions but return of spontaneous circulation could not be achieved following which ECPR was initiated with 25 Fr multistage venous cannula in left femoral vein and 19 Fr return cannula in right common femoral artery. Spontaneous circulation was achieved after 8 mins of ECPR initiation. The patient continued to have further 8 more episodes of VT for the next 24 hours which were managed with cardioversion. The patient was also started on lignocaine infusion for 48 hrs. He gradually regained sensorium and co-oxymetry was not suggestive of any methemoglobinemia. LV function gradually improved to 40%. ECMO was gradually weaned, and the patient was decannulated on day 3, discharged on day 9.

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PEDIATRIC ECPR PROCESS MAPPING: A UNIQUE APPROACH USING VIDEO-ASSISTED HIGH-FIDELITY IN-SITU SIMULATION TRAINING

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Form: poster, **theme:** all aspects of ECPR

Purpose of the study: To create a process map of time to cannulation in a simulated real time ECPR using video-assisted high-fidelity simulation.
Background: In pediatric ECPR, low-flow duration remains a key metric and is associated with both survival as well as favorable neurological outcome at hospital discharge. Time to cannulation depends on resources available, speedy decision making, use of protocols and team dynamics.
Real-time video review of resuscitation events allows a novel and more accurate approach to resuscitation quality evaluation.
Materials and methods:
Setting: Quaternary pediatric CICU.
Method: Using real-time, SPRinT (Simulated interPRofessional Team Training) facilitated in-situ video-assisted, high-fidelity simulation recreating a neonatal ECPR scenario with multi-disciplinary staff, participating in their own roles. Total of 16 staff members participated.
Review of footage and debriefs focused on timing metrics from onset of sudden deterioration to all key interventions leading up to cannulation.
Results: Results presented in sufficient detail to support the conclusions.
Key metrics evaluated: a. recognition of impending cardiac arrest; b. ECPR decision making – candidacy and time to activate ECPR team; c. time to cannulate; d. use of point-of-care ultrasound (POCUS); e. use of protocol; f. closed loop communication; g. role allocation; h. leadership; i. CPR efficacy monitoring.
Conclusions: Video-assisted high-fidelity simulation offers a valuable tool to identify and deconstruct ECPR workflow and timing gaps in pediatric settings. It helps build strategies to improve team response, CPR quality, cannulation speed, and support systems vital for pediatric ECPR success.

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INTRAOPERATIVE ECPR WITH OPEN ABDOMEN IN A NEONATE WITH CONGENITAL DIAPHRAGMATIC HERNIA

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Form: poster, **theme:** all aspects of ECPR

Introduction: We present a case of a neonate with congenital diaphragmatic hernia who had intraoperative ECPR. Her postoperative course was complicated by multiorgan dysfunction and challenges with the open chest and abdomen.
Case description: A 2.6 kg female infant was born at 35 weeks of gestation with an antenatal diagnosis of left intrapleural diaphragmatic hernia containing the left lobe of the liver, spleen, small bowel and right hemicolon. She was intubated in the delivery room. A chest-abdomen

x-ray confirmed the diagnosis, and there were no signs of pulmonary hypertension on echocardiography.
On day 5 of life, she underwent thoracoscopic surgical repair. Multiple unsuccessful attempts at reduction with resultant splenic capsular injury led to an open surgical approach. The abdomen was opened with a subcostal incision, and findings were in agreement with the antenatal scan. At this point, she went into pulseless electrical activity. CPR was initiated. Abdominal contents were removed from the chest. Reversible causes were ruled out, and a mechanical event leading to twisting of vessels and reduced preload or pulmonary hypertensive crisis was thought to be the likely etiology. She was cannulated for VA ECMO through neck vessels. Due to no flow in the venous cannula, the right atrial cannula was inserted with a total time of 68 minutes to full ECMO flows. The right internal jugular vein was divided. Abdominal bleeding was a persistent issue as a result of anticoagulation on ECMO. She spent 6 days on ECMO before her CDH was repaired. Her chest and abdomen were left open due to generalized oozing and oedema. Her chest was closed one week later. The clinical course was challenging due to ongoing abdominal bleeding, persistent inhaled nitric oxide requirement and hemodynamic instability. The abdomen was closed in stages according to her ability to tolerate raised intra-abdominal compartment pressures. She remained on CRRT for acute tubular necrosis. Ventilation weaning was commenced once her abdomen was closed. She could only come off CRRT once her abdomen was closed with subsequent ventilation weaning. An MRI of the head showed encephalomalacia and chronic biparietal infarcts. The symptom care team was involved at all stages of decision-making. She was extubated at 9 weeks of life.
Conclusion: Decision-making for ECPR was significantly challenging due to high risk for bleeding with open abdomen, predisposition for brain injury, difficult vascular access, low weight and significant CDH defect with guarded prognosis. The postoperative course was equally challenging due to ongoing abdominal bleeding, stepwise abdominal closure, respiratory and hemodynamic compromise and CRRT dependence with challenging vascular access due to tied-off right-sided neck vessels. Despite the stormy course, she was discharged home with no respiratory support at five months of age.

COMPARABLE LONG-TERM COGNITIVE OUTCOMES IN SURVIVORS OF EXTRACORPOREAL AND CONVENTIONAL CPR

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Form: poster, **theme:** all aspects of ECPR

Purpose: Both cardiac arrest with cardiopulmonary resuscitation (CPR) and ECMO-treatment are independently associated with long-term cognitive dysfunction. Extracorporeal CPR (ECPR) exposes patients to both prolonged cardiac arrest times and ECMO treatment, yet comprehensive data on long-term cognitive outcomes in this population are lacking. Therefore, this study aims to: 1) investigate cognition in ECPR-survivors and 2) compare cognition in ECPR-survivors with cognition in CPR-only survivors.
Material and methods: Survivors >1 year after ECPR at Sahlgrenska University Hospital underwent a neuropsychological evaluation using the identical protocol employed for cardiac arrest survivors of a TTM-2 sub-study 1, enabling direct comparison between ECPR and CPR groups. Eleven standardized neuropsychological tests were transformed to z-scores to calculate outcomes across six cognitive domains: verbal, visual/constructive, working memory, episodic memory, processing speed and executive functions. Group difference was evaluated using unadjusted linear regression, followed by regression adjusted for education, sex, depression, anxiety, fatigue, and insomnia. Participants were categorized by z-scores as having no impairment (>–1 SD), mild (>2 to ≤–1 SD) or major cognitive impairment (≤–2 SD).
Results: There were 21 ECPR participants and 108 CPR participants in the study. Mean cognitive performance was close to population norms (Z-score = 0) in both ECPR and CPR groups, with scores across all domains ranging from –0.44 to 0.26. No significant differences between the groups were found in neither the unadjusted nor the adjusted linear regression analysis. Episodic memory was the most frequently impaired domain (29% ECPR, 28% CPR) followed by executive function (24% ECPR, 21% CPR).
Conclusions: Despite the dual insults of prolonged cerebral ischemia and ECMO-treatment, ECPR survivors had long-term cognitive outcomes comparable to conventional CPR survivors and close to population norms.

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FROZEN, POISONED, REVIVED: ECPR FOR HYPOTHERMIC ETHYLENE GLYCOL ARREST

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Form: poster, **theme:** all aspects of ECPR

Case presentation: A 48-year-old woman was found unconscious, hypothermic, and hypotensive on a view tower on a mountain. Due to unconsciousness, rapid sequence intubation was performed and she was evacuated down the tower to reach the helicopter. During loading she arrested (fine ventricular fibrillation, VF); advanced resuscitation with manual compressions were performed during the flight (approximately one hour).
On hospital arrival, her core temperature was 25.9 °C and VF persisted. Mechanical compressions using LUCAS were started and extracorporeal cardiopulmonary resuscitation (ECPR) was initiated. Due to vascular access challenges for veno-arterial extracorporeal membrane oxygenation (VA-ECMO), esophageal rewarming began and dialysis catheters were placed for possible combined rewarming while securing arterial access. VA-ECMO started approximately three hours after she was found. Initial arterial blood gas analysis was: pH 6.72, pCO_2 3.3 kPa, HCO_3 3.1 mmol/L, base excess –32.9 mmol/L. Point-of-care lactate was 6.96 mmol/L while central laboratory lactate was 2.8 mmol/L, indicating a lactate gap. A high serum anion gap and urinary calcium oxalate crystals suggested ethylene glycol (EG) poisoning, and fomepizole with hemodialysis were promptly initiated. EG intoxication was later confirmed toxicologically. At 34 °C, defibrillation achieved return of spontaneous circulation, and VA-ECMO was weaned within seven hours. She made a full neurologic recovery despite three hours of low-flow state, was extubated on day four and transferred for rehabilitation.
Conclusion: This case demonstrates the potential of ECPR in prolonged cardiac arrest due to severe hypothermia and EG poisoning. It highlights the diagnostic utility of the lactate gap, which is often overlooked in emergency settings.[1,2]

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BUILDING A SYSTEM-OF-CARE FOR ECPR IN OUT-OF-HOSPITAL CARDIAC ARREST: THE QATAR EXPERIENCE

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Form: poster, **theme:** all aspects of ECPR

Background: Survival after out-of-hospital cardiac arrest (OHCA) remains low globally. Extracorporeal CPR (eCPR) may benefit select patients, but it requires a coordinated system to deliver timely cannulation and post-resuscitation care.
Objectives: To describe the design, implementation, and early outcomes of a national eCPR pathway for OHCA within an integrated ambulance–hospital network.
Methods: We developed a National Cardiac Arrest Centre pathway, anchored at a tertiary hospital, which aligns ambulance, emergency medicine, cardiology, cardiothoracic surgery, ECMO, and critical care services. Key pathway components included a dedicated eCPR hotline/trolley/space, primed ECMO circuits, 24/7 consultant coverage, and multidisciplinary simulation training. Quality measures tracked ambulance and transport times, activation-to-ECMO team bedside time, puncture-to-flow time, and clinical outcomes. Contextual OHCA epidemiology was derived from the national registry.
Results: In 2023, the registry recorded 970 OHCAs (81% male); bystander CPR accounted for roughly one-fifth to nearly half of monthly cases, with shockable rhythms present in a substantial minority. ROSC at handover varied across months. Following staged implementation (2015–2019), eCPR activations rose, with annual cases peaking at 31 in 2019. Survival among eCPR patients was 3/11 in 2018 (27%), 9/31 in 2019 (29%), 3/7 in 2020 (43%), and 1/2 in 2021 (50%); across 2018–2021, this was 16/51 (31%). Control-chart monitoring showed sustained improvements in key process intervals after pathway optimization.
Conclusions: A coordinated, pre-planned eCPR pathway embedded within an integrated ambulance–hospital network is feasible and associated with acceptable survival in a real-world OHCA program. Ongoing work focuses on reducing activation-to-flow intervals, promoting consistent bystander CPR, and conducting prospective outcomes research.

PILOT PROJECT OF PRE-HOSPITAL ECPR IN PRAGUE: EARLY EXPERIENCE AND OUTCOMES

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Form: poster, **theme:** all aspects of ECPR

Purpose: Early initiation of extracorporeal cardiopulmonary resuscitation (ECPR) significantly improves survival and neurological outcomes in refractory cardiac arrest. To shorten low-flow times, a pre-hospital ECPR pilot project was launched in Prague in January 2025. This abstract

summarizes the rationale, organizational model, and first results.

Materials and methods: The Prague EMS, in cooperation with a specialized ECMO team from the General University Hospital (VFN), developed a structured protocol for on-site ECPR. Activation criteria included witnessed cardiac arrest, age 18–70 years, ongoing advanced CPR or EMS arrival within 5 minutes, no severe comorbidities, and initial rhythm of VF, pulseless VT, or PEA. A dedicated pre-hospital ECMO team was available on weekdays (8.00–16.00). Data on all activations, time intervals, and patient outcomes were prospectively collected.

Results: Since January 2025, the pre-hospital ECPR team has been activated 19 times. Seven patients were reached; in five cases cannulation and VA-ECMO initiation were successfully performed on scene, while in two cases ROSC occurred before cannulation. The median time from collapse to ECMO support was 42 minutes for five pre-hospital cases. For comparison, during the same period, 21 patients underwent in-hospital ECPR with a median collapse-to-ECMO time of 60 minutes. The difference in collapse-to-ECMO time between groups is statistically significant (p = 0.001, t-test). All included patients fulfilled the selection criteria. Among the five patients treated with pre-hospital ECPR, three died (two were successfully enrolled in an organ donation program), and two survived with good neurological outcomes: one with CPC 1 and one with CPC 2.

Conclusions: Pre-hospital ECPR in Prague is feasible and has the potential to significantly shorten low-flow times compared to in-hospital initiation. Early outcomes demonstrate both successful organ donation and favorable neurological recovery in survivors. Integration of pre-hospital ECMO teams into EMS systems may expand access to advanced resuscitation, but requires continuous education, clear communication protocols, and close cooperation between EMS, hospitals, and first responders.

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