





From out of hospital resuscitation to organ explantation: a case report

 **Valentina Gal***,
 **Ana Vlašiček**,
 **Ivana Pecak**,
 **Renata Čosić**

University Hospital Centre
"Sestre milosrdnice", Zagreb,
Croatia

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***ADDRESS FOR CORRESPONDENCE:** Valentina Gal, Klinički bolnički centar Sestre milosrdnice, Vinogradska 29, HR-10000 Zagreb, Croatia. / Phone: +385-98-1624-432 / E-mail: gal.valentina5@gmail.com

ORCID: Valentina Gal, <https://orcid.org/0000-0002-3083-0086> • Ana Vlašiček, <https://orcid.org/0000-0003-0317-3575>
Ivana Pecak, <https://orcid.org/0000-0001-8776-8802> • Čosić Renata, <https://orcid.org/0000-0001-6508-7432>

Introduction: Cardiopulmonary resuscitation (CPR) is an emergent life-saving procedure that is performed in cases of respiratory or cardiocirculatory arrest. One of the most important and deciding factors in CPR success rates is a timely and appropriate reaction and response. As defined by the European Society of Cardiology (ESC), CPR by its methods and provider, is differentiated into Advanced life support (ALS) and Basic life support (BLS).¹ It is estimated that, in Croatia, nine thousand people go into cardiorespiratory arrest out-of-hospital.² After complete cardiorespiratory arrest and circulatory standstill, the brain can only survive without oxygen for 3 - 5 minutes, which is far shorter than the average emergency services response time. Because of this, only 1 out of 10 out-of-hospital cardiac arrest victims survive. However, regular citizens turn out to be a great possible vector of change to the detrimental statistic since bystanders are in 60 - 80% of cases witnesses of cardiocirculatory arrest. If CPR is performed immediately following cardiopulmonary arrest, the probability of survival and favorable neurologic outcomes increase up to 2 - 4 times. The provided information has been an indicator of the great importance of educating the public about BLS. Recognizing this, Croatia has also, since 2013, started organizing The European Restart the heart day every year on October 16, with the goal of improving general awareness of how to recognize cardiac arrest early and react appropriately. Inadequate and untimely CPR can cause the victim to end up with a neurologically unfavorable outcome including brain death, which, in turn, can lead to the victim being eligible for organ donation. In Croatia, every person who is declared dead and has not explicitly expressed wishes against organ donation is eligible to become a donor. Even though the law in Croatia doesn't mandate explicit permission to be acquired, in practice, if the family is against explantation then those wishes are also honoured.³ The importance of public education in providing CPR needs to be stressed. Some of the means of education are, for example, the campaign "OŽIVI ME" ("REVIVE ME") and educational workshops in medical institutions or online.⁴

Case report: 43-year-old patient with a negative family history of cardiovascular disease was hospitalized on April 8, 2023 in the University Hospital Centre "Sestre milosrdnice", at the Institute for Intensive Cardiac Care, after an out-of-hospital cardiorespiratory arrest. The patient was at cardiorespiratory arrest in a public place, where her husband started CPR, while no one else start to help him. When ambulance come, the initial rhythm was pulseless electrical activity, then ventricular fibrillation and ventricular tachycardia without pulse, and shocks of 150 and 200 J were delivered. He comes to the Emergency Hospital Department with an I-gel in, then the patient was endotracheally intubated with a 7.5 Fr tube and connected to a ventilator. After the necessary laboratory tests, 12-lead ECG, CT of the brain and CT angiography of the pulmonary arteries, the patient is prepared for coronary angiography according to the procedure. Through percutaneous coronary intervention, it is established that all three epicardial coronary arteries are free of stenoses, and the patient, accompanied by medical staff, is transferred to the Institute for Intensive Cardiac Care, where the process of therapeutic hypothermia begins with the help of a hypothermia device. Upon arrival at Coronary Care Unit (CCU), the patient's vital functions are normal, the Glasgow Coma Scale was 3, a central venous catheter and invasive pressure measurement are placed with the assistance of a nurse. According to the procedure for hypothermia, the necessary surveillance cultures were taken by the nurse (blood cultures, urine culture and tracheal aspirate) and laboratory blood tests. During the patient's stay in CCU, trained nurses monitor and control vital functions and record changes in them. The patient was sedated with analgesia and has had no further rhythm disturbances since arriving at CCU. Considering the complexity of the patient's condition, the nurses created an adequate health care plan and selected interventions to achieve the given goal as best as possible. With teamwork and a holistic approach, nurses meet the basic human needs of patients. After the process of therapeutic hypothermia for 72 hours, and end of analgesedation, according to the protocol, the level of neuron-specific enolase was determined, which is high, while the neurological status is monitored by GCS 3, without recovery of consciousness and the absence of all reflexes. The patient was examined by a neurologist and anesthesiologist and on April 13, at 9:40 a.m. he declares that patient brain is death. An interview was conducted with family members who agree that the patient is a candidate for organ explantation for the purpose of donating them. By agreement, the patient is transferred to Central Intensive Care Unit for further preparation for organ explantation, from where both kidneys, liver and heart are transported to the tissue bank in University Hospital Centre Zagreb, which saved more lives.

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