

Ambulances should take cardiac arrest victims to closest emergency department, study shows

August 29 2023



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A randomized trial involving all hospitals in London, U.K., has found no difference in survival at 30 days in patients with resuscitated cardiac

arrest in the community who were taken by ambulance to a cardiac arrest center compared with those delivered to the geographically closest emergency department. That's the finding of late breaking research presented in a Hot Line session August 27 at [ESC Congress 2023](#). The study also found no overall difference in neurological outcomes at discharge and at three months between groups.

Sudden [cardiac arrest](#) causes one in five deaths in industrialized countries. Cardiopulmonary resuscitation by laypeople, early defibrillation and advances in management in-hospital have improved prognosis after out-of-hospital cardiac arrest (OHCA). Despite this, only one in 10 patients resuscitated from OHCA survive to hospital discharge.

Cardiac arrest centers provide targeted [critical care](#), acute cardiac care, radiology services and appropriate neuroprognostication beyond what is available in conventional emergency departments. Data from non-randomized studies suggest that ambulance delivery of OHCA patients to specialist cardiac arrest centers improves survival; and there is a strong drive internationally to preferentially treat cardiac arrest victims at these centers. The International Liaison Committee On Resuscitation (ILCOR) therefore called for a randomized trial to generate more robust evidence.

The ARREST trial investigated whether expedited transfer of OHCA patients to a cardiac arrest center reduces mortality compared with delivery to the closest emergency department. The trial also examined whether there was any difference in neurological outcomes with the two strategies. This was a randomized controlled trial conducted pre-hospital across the whole of London examining a pathway of care.

Patients successfully resuscitated after an OHCA but without ST-elevation on their post-resuscitation electrocardiogram (ECG) were randomized pre-hospital to 1) expedited (rapid) delivery to a cardiac

arrest center (of which there are seven in London) or 2) delivery to the nearest emergency department (of which there are 32 in London), which is the current standard of care—both by the London Ambulance Service. In the intervention arm, paramedics alerted the receiving cardiac arrest center prior to arrival.

The primary endpoint was all-cause mortality at 30 days in the intention-to-treat population. Secondary endpoints included all-cause mortality at three months and neurological outcomes at discharge and three months, assessed by the modified Rankin scale and cerebral performance category (CPC) score.

Between 15 January 2018 and 1 December 2022, 862 patients were enrolled, of whom 431 (50%) were randomly assigned by London Ambulance Service paramedics to expedited transfer to a cardiac arrest center and 431 (50%) to standard care. Some 32% of participants were women.

The primary outcome of 30-day all-cause mortality occurred in 258 (63%) of 411 patients in the cardiac arrest center group and 258 (63%) of 412 patients in the standard care group (unadjusted risk ratio [RR] for survival 1.00, 95% confidence interval [CI] 0.90 to 1.11, $p=0.96$; risk difference 0.2%, 95% CI -6.5 to 6.8). There was no difference in the secondary endpoint of three-month all-cause mortality between the two groups (RR 1.02, 95% CI 0.92 to 1.12; risk difference 1.0%, 95% CI -5.6 to 7.5). Neurological outcomes were similar at hospital discharge and three months for both the modified Rankin scale (odds ratio 1.00, 95% CI 0.76 to 1.32) and CPC score (0.98, 95% CI 0.74 to 1.30).

Study author Dr. Tiffany Patterson of Guy's and St Thomas' NHS Foundation Trust, London, U.K. said, "This study does not support transportation of all patients to a cardiac arrest center following resuscitated cardiac arrest within this health care setting. Cardiac arrest

centers are heavily resourced hospitals. If delivering these patients to such centers to receive multiple interventions does not improve overall survival, then these resources are better allocated elsewhere.

"Furthermore, if cardiac arrest patients are not taken to such hospitals, this frees up space for other emergency work—including trauma, ST-elevation myocardial infarction and acute aortic dissection—that requires high-dependency beds and the specialist input provided by these centers."

Provided by European Society of Cardiology

Citation: Ambulances should take cardiac arrest victims to closest emergency department, study shows (2023, August 29) retrieved 28 April 2024 from <https://medicalxpress.com/news/2023-08-ambulances-cardiac-victims-closest-emergency.html>

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