

Bystander CPR linked to lower nursing home admission and brain damage after cardiac arrest

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Bystander cardiopulmonary resuscitation (CPR) has been linked to a 30% lower risk of nursing home admission and brain damage in survivors of cardiac arrest outside hospital in research presented at ESC Congress today by Dr Kristian Kragholm, a PhD student in the Department of Anesthesiology, Cardiovascular Research Centre, Aalborg University Hospital, Denmark.

"We know that survival after out-of-hospital cardiac arrest has improved in recent years but until now the degree of disability in [survivors](#) was unknown," said Dr Kragholm. "Our study examined the rate of nursing home admission and brain damage in survivors and which factors had an impact on these measures of disability."

Between 2001 and 2011 in Denmark, 2 469 out of 32 883 out-of-hospital cardiac arrest patients were alive after 30 days. The current study included the 2 387 adult survivors who did not have brain damage or live in a nursing home before the cardiac arrest. The investigators analysed the association between a number of factors (bystander CPR, age, sex, comorbidities, year of arrest, whether the arrest was witnessed or not, whether the cardiac rhythm was shockable or not, cause of arrest) with the occurrence of death and a composite endpoint of nursing home admission or brain damage within one year after the arrest.

During the first year after cardiac arrest, 7% of patients died, 11% were

admitted to a nursing home or were diagnosed with brain damage, and 81% did not experience any of these events. In multivariable modelling, bystander CPR was the only factor significantly associated with lower risk of nursing home admission or brain damage with a hazard ratio of 0.67 (95% confidence interval 0.51-0.89, $p=0.005$).

"That so many 30 day survivors seem to be in good health at one year follow up is laudable," said Dr Kragholm. "We have previously shown that survival more than doubled during the past decade in Denmark and now we show that not only did more patients survive, the vast majority of survivors were not admitted to nursing homes or diagnosed with brain damage."

He continued: "But the finding that bystanders can potentially prevent brain damage and admission to a nursing home following cardiac arrest is even more laudable."

"We found that the risk of brain damage or nursing home admission was around 30% lower if bystanders performed CPR than if they did not," said Dr Kragholm. "When cardiac arrest occurs, the pump function of the heart abruptly stops and the oxygen supply to vital organs including the brain is impaired. This can lead to brain damage and the need for institutional care if the patient survives. Bystanders initiating CPR can help circulate oxygen in the blood to the brain and thereby increase the chances of patient survival without brain damage."

The researchers previously showed that national initiatives in Denmark between 2001 and 2011 increased bystander CPR and survival after [cardiac arrest](#). These included mandatory basic life support courses in elementary schools and when acquiring a driver's license as well as introducing health care professionals into emergency dispatch centres to guide laymen's recognition of arrest and initiation of CPR.

Dr Kragholm said: "The current study shows that the benefits of bystander CPR seem to go beyond survival and also impact on the physical and mental health of survivors. This novel and important finding demonstrates how vital it is that CPR is promptly initiated to increase not only chances of survival but also reduce [brain damage](#) and nursing home admission in survivors. Initiatives that improve bystander recognition of arrest and willingness to initiate CPR hold the potential to improve the chances of survival with intact function and enable survivors to carry on with their lives as before the arrest."

More information: Dr Kragholm will present the abstract 'Bystander cardiopulmonary resuscitation associated with lower risk of nursing home admission and anoxic brain damage in out-of-hospital cardiac arrest survivors'

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