New evidence indicates patients recall death experiences after cardiac arrest

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AWARE-II study team practicing brain monitoring methods. Credit: NYU Langone Health

Up to an hour after their hearts had stopped, some patients revived by cardiopulmonary resuscitation (CPR) had clear memories afterward of

experiencing death, and while unconscious, had brain patterns linked to thought and memory, report investigators in the journal *Resuscitation*.

In a study led by researchers at NYU Grossman School of Medicine, in cooperation with 25 mostly US and British hospitals, some survivors of cardiac arrest described lucid death experiences that occurred while they were seemingly unconscious. Despite immediate treatment, fewer than 10% of the 567 patients studied, who received CPR in the hospital, recovered sufficiently to be discharged. Four in 10 of patients who survived, however, recalled some degree of consciousness during CPR not captured by standard measures.

The study also found that in a subset of these patients, who received brain monitoring, nearly 40% had brain activity that returned to normal, or nearly normal, from a "flatline" state, at points even an hour into CPR. As captured by EEG, a technology that records brain activity with electrodes, the patients saw spikes in the gamma, delta, theta, alpha, and beta waves associated with higher mental function.

Survivors have long reported having heightened awareness and powerful, lucid experiences, say the study authors. These have included a perception of separation from the body, observing events without pain or distress, and a meaningful evaluation of their actions and relationships. This new work found these experiences of death to be different from hallucinations, delusions, illusions, dreams, or CPR-induced consciousness.

The study authors hypothesize that the "flatlined," dying brain removes natural inhibitory (braking) systems. These processes, known collectively as disinhibition, may open access to "new dimensions of reality," they say, including lucid recall of all stored memories from early childhood to death, evaluated from the perspective of morality. While no one knows the evolutionary purpose of this phenomenon, it "opens the door to a

systematic exploration of what happens when a person dies."

Senior study author Sam Parnia, MD, Ph.D., associate professor in the Department of Medicine at NYU Langone Health and director of critical care and resuscitation research at NYU Langone, says, "Although doctors have long thought that the brain suffers permanent damage about 10 minutes after the heart stops supplying it with oxygen, our work found that the brain can show signs of electrical recovery long into ongoing CPR. This is the first large study to show that these recollections and brain wave changes may be signs of universal, shared elements of so-called near-death experiences."

Dr. Parnia adds, "These experiences provide a glimpse into a real, yet little understood dimension of human consciousness that becomes uncovered with death. The findings may also guide the design of new ways to restart the heart or prevent brain injuries and hold implications for transplantation."

Called the AWAreness during REsuscitation (AWARE)-II study, it followed 567 men and women who suffered cardiac arrest during hospital stays between May 2017 and March 2020 in the United States and United Kingdom. Only hospitalized patients were enrolled to standardize the CPR and resuscitation methods used, as well as recording methods for brain activity.

A subset of 85 patients received brain monitoring during CPR. Additional testimony from 126 community survivors of cardiac arrest with self-reported memories was also examined to provide greater understanding of the themes related to the recalled experience of death.

The study authors conclude that research to date has neither proven nor disproven the reality or meaning of patients' experiences and claims of awareness in relation to death. They say the recalled experience

surrounding death merits further empirical investigation, and they plan to conduct studies that more precisely define biomarkers of clinical consciousness and that monitor the long-term psychological effects of resuscitation after cardiac arrest.

More information: Sam Parnia et al, AWAreness during REsuscitation—II: A multi-center study of consciousness and awareness in cardiac arrest, *Resuscitation* (2023). DOI: 10.1016/j.resuscitation.2023.109903

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