

Results of the World's Largest Medical Study of the Human Mind and Consciousness at the Time of Death available in the journal *Resuscitation*

The results of a four-year international study of 2060 cardiac arrest cases across 15 hospitals published and available now on [ScienceDirect](#). The study concludes:

- The themes relating to the experience of death appear far broader than what has been understood so far, or what has been described as so called near-death experiences.
- In some cases of cardiac arrest, memories of visual awareness compatible with so called out-of-body experiences may correspond with actual events.
- A higher proportion of people may have vivid death experiences, but do not recall them due to the effects of brain injury or sedative drugs on memory circuits.
- Widely used yet scientifically imprecise terms such as near-death and out-of-body experiences may not be sufficient to describe the actual experience of death. Future studies should focus on cardiac arrest, which is biologically synonymous with death, rather than ill-defined medical states sometimes referred to as 'near-death'.
- The recalled experience surrounding death merits a genuine investigation without prejudice.

Recollections in relation to death, so-called out-of-body experiences (OBEs) or near-death experiences (NDEs), are an often spoken about phenomenon which have frequently been considered hallucinatory or illusory in nature; however, objective studies on these experiences are limited.

In 2008, a large-scale study involving 2060 patients from 15 hospitals in the United Kingdom, United States and Austria was launched. The AWARE (AWAREness during REsuscitation) study, sponsored by the University of Southampton in the UK, examined the broad range of mental experiences in relation to death. Researchers also tested the validity of conscious experiences using objective markers for the first time in a large study to determine whether claims of awareness compatible with out-of-body experiences correspond with real or hallucinatory events.

Results of the study have been published in the journal [Resuscitation](#) and are now available online.

Dr Sam Parnia, Assistant Professor of Critical Care Medicine and Director of Resuscitation Research at The State University of New York at Stony Brook, USA, and the study's lead author, explained: "Contrary to perception, death is not a specific moment but a potentially reversible process that occurs after any severe illness or accident causes the heart, lungs and brain to cease functioning. If attempts are made

to reverse this process, it is referred to as 'cardiac arrest'; however, if these attempts do not succeed it is called 'death'. In this study we wanted to go beyond the emotionally charged yet poorly defined term of NDEs to explore objectively what happens when we die."

Thirty-nine per cent of patients who survived cardiac arrest and were able to undergo structured interviews described a perception of awareness, but interestingly did not have any explicit recall of events.

"This suggests more people may have mental activity initially but then lose their memories after recovery, either due to the effects of brain injury or sedative drugs on memory recall," explained Dr Parnia, who was an Honorary Research Fellow at the University of Southampton when he started the AWARE study.

Among those who reported a perception of awareness and completed further interviews, 46 per cent experienced a broad range of mental recollections in relation to death that were not compatible with the commonly used term of NDE's. These included fearful and persecutory experiences. Only 9 per cent had experiences compatible with NDEs and 2 per cent exhibited full awareness compatible with OBE's with explicit recall of 'seeing' and 'hearing' events.

One case was validated and timed using auditory stimuli during cardiac arrest. Dr Parnia concluded: "This is significant, since it has often been assumed that experiences in relation to death are likely hallucinations or illusions, occurring either before the heart stops or after the heart has been successfully restarted, but not an experience corresponding with 'real' events when the heart isn't beating. In this case, consciousness and awareness appeared to occur during a three-minute period when there was no heartbeat. This is paradoxical, since the brain typically ceases functioning within 20-30 seconds of the heart stopping and doesn't resume again until the heart has been restarted. Furthermore, the detailed recollections of visual awareness in this case were consistent with verified events.

"Thus, while it was not possible to absolutely prove the reality or meaning of patients' experiences and claims of awareness, (due to the very low incidence (2 per cent) of explicit recall of visual awareness or so called OBE's), it was impossible to disclaim them either and more work is needed in this area. Clearly, the recalled experience surrounding death now merits further genuine investigation without prejudice."

Further studies are also needed to explore whether awareness (explicit or implicit) may lead to long term adverse psychological outcomes including post-traumatic stress disorder.

Dr Jerry Nolan, Editor-in-Chief of *Resuscitation*, stated: "The AWARE study researchers are to be congratulated on the completion of a fascinating study that will open the door to more extensive research into what happens when we die."

Ends

Notes to editors:

1. The paper is available from ScienceDirect - <http://www.sciencedirect.com/science/journal/aip/03009572>

2. The full range of recalled mental and cognitive experiences included: 1) fear; 2) animals/plants; 3) a bright light; 4) violence/persecution; 5) deja-vu; 6) family; 7) recalling events after recovery from cardiac arrest.

3. Dr. Sam Parnia is an Assistant Professor of Critical Care Medicine and Director of Resuscitation Research at The State University of New York at Stony Brook, USA and an Honorary Fellow at University Hospital Southampton NHS Foundation Trust (UHS), UK.

4. The AWARE study was sponsored by the University of Southampton, UK and funded by The Resuscitation Council (UK), Nour Foundation and Bial Foundation.

Investigators from the following institutions participated in the study: United Kingdom (1) University Hospital Southampton NHS Foundation Trust, 2) Hammersmith Hospital, Imperial College, University of London, 3) Addenbrookes Hospital, University of Cambridge UK, 4) Royal Bournemouth Hospital, Bournemouth, 5) St Georges Hospital, University of London, 6) Northampton General Hospital, Northampton, 7) Lister Hospital, Stevenage, 8) Mayday Hospital London, 9) James Paget Hospital, UK, 10) East Sussex Hospital East Sussex UK, 11) Ashford & St Peters NHS Trust, UK, United States (12) Stony Brook Medical Center, State University of New York at Stony Brook, NY, 13) Montefiore Medical Center, New York, 14) Emory University School of Medicine & Atlanta Veterans Affairs Medical Center Atlanta, 15) Indiana University, Wishard Memorial Hospital, Indianapolis, 16) University of Virginia, Charlottesville, VA) and 17) Austria (Medical University of Vienna). Twenty five sites originally agreed to participate. Among this group 15 were chosen to contribute to patient recruitment and a further two sites provided other research contributions.

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6. *Resuscitation* is an interdisciplinary journal for the dissemination of clinical and basic science research relating to acute care medicine and cardiopulmonary resuscitation.

Resuscitation is the only journal that is focused entirely on cardiac arrest and cardiopulmonary resuscitation.

The journal content will be of interest to healthcare professionals working in critical care, emergency medicine, acute medicine, anaesthesia, cardiology, paediatrics, and neonatology.

Resuscitation is the official Journal of the [European Resuscitation Council](http://www.resuscitationcouncil.org)

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