

**ILCOR SCIENTIFIC ADVISORY STATEMENT PROPOSAL**

**1. Proposed Manuscript Title**

**IMPROVING OUTCOMES FOLLOWING POST-CARDIAC ARREST BRAIN INJURY**

**2. Environmental Scan**

Each year an estimated 3.5 million people sustain an out of hospital cardiac arrest around the world. If resuscitation is attempted, approximately one third are admitted to intensive care after a return of spontaneous circulation is achieved. Despite active treatments in intensive care, two thirds of these patients will die prior to hospital discharge. The majority of these patients (65%) die from the devastating consequences of post-cardiac arrest brain injury. For those fortunate enough to survive the initial cardiac arrest, the majority experience some neurocognitive functional impairment, ranging from mild cognitive problems to survival in a persistent vegetative state.

The ILCOR Core Outcome Set for Cardiac Arrest (COSCA) identified that survival with a favourable neurological outcome and good health related quality of life were of critical importance to patients, their relatives and healthcare professionals who provide their care and treatment. Despite its importance ILCOR’s Post Resuscitation Care Consensus on Science and Treatment Recommendations (2015) noted an absence of evidence for effective treatments of this condition. This statement will draw on the output from the on-going NCS/AHA consensus work but it will have a separate and distinct focus on the development of new therapies for post cardiac arrest brain injury.

**3. Need for the Paper**

|  |
| --- |
| Sharon Maughan’s mum sustained an out of hospital cardiac arrest just before Christmas last year.  Despite bystander CPR from her husband and early aggressive post resuscitation care, she died from catastrophic brain injury 6 days later.  Her death has left a huge gap amongst her family.  Sharon and her family donated the proceeds from the funeral to support an international collaboration to improve outcomes from post-cardiac arrest injury after cardiac arrest. |

There is an urgent need to improve the treatment of post-cardiac arrest brain injury after cardiac arrest. This state of the art review will:

* Develop a conceptual framework for the pathophysiology, classification and phases of post-cardiac arrest brain injury after cardiac arrest
* Explore reasons for previous failure of preclinical data to translate to clinical practice and consider what pre-clinical data are required to justify future human clinical trials
* Make recommendations for end-points, real-time monitoring and clinical trial design for early phase efficacy / proof of concept trials
* Identify and prioritise a list of promising clinical therapies / future treatments across a range of times and settings

This project will pull together experts from ILCORs extensive networks to enable some of the best minds to come together. It will provide an up to date summary of best current practice and serve as a stimulus to accelerate the development and evaluation pathway of new neuroprotective therapies. The output of this project will help to save more lives globally through resuscitation and effective post-cardiac arrest care.

Our approach will embrace ILCOR’s values. We will prioritise, scientific rigour, collaboration, diversity and integrity, whilst remaining accountable and responsive to ILCOR’s General Assembly.

**4. Audience**

Healthcare professionals, cardiac arrest and neurocritical care researchers, clinical triallists, patients and the public, research funders.

**5. Lay Summary**

Sudden cardiac arrest, which describes the condition where the heart stops beating effectively, is a devastating worldwide problem. Although cardiopulmonary resuscitation (CPR) and defibrillation (electric shocks) are effective treatments for restarting the heart, tens of thousands of people worldwide subsequently die from or are left with damaged brains after cardiac arrest. Brain damage occurs as the brain is deprived of oxygen after the heart has stopped. Current treatments are only partly successful at restoring blood and oxygen supply to the brain during resuscitation. There are no effective treatments which have been shown with certainty to reduce brain damage after cardiac arrest. There is an urgency to accelerate our understanding of brain injury after cardiac arrest and to develop new treatments for this devastating condition.

This state of the art review will summarise what is already known about how the brain is injured after cardiac arrest. It will explore what we know about current treatments and how we should test and evaluate future treatments. It will provide guidance to researchers about how best to undertake research in the future and will present a prioritized list of new treatments which require further research.

**6. Implications**

This statement will highlight the devastating consequences of brain injury after cardiac arrest. It is intended that this will raise awareness amongst patients and the public, clinicians and those responsible for public health. By summarizing the burden of disease, paucity of current effective treatments and providing an experimental framework for future interventions evaluation, it is hoped that this will accelerate researchers and those funding research to prioritise future research in this area.

**7. Proposed Writing**

**Co-ordinating Group**

* Lance Becker (US), Chair of Emergency Medicine at Northwell Health, New York
* Cliff Callaway (US), Executive Vice-Chair of Emergency Medicine, University of Pittsburgh
* Matthew Rowlands, Lecturer, University of Oxford (young investigator)
* Bob Neumar (US), Professor and Chair, Emergency Medicine, University of Michigan Medical School
* Jerry Nolan (UK), Professor of Resuscitation Medicine, University of Warwick
* Gavin Perkins (UK), Professor of Critical Care Medicine, University of Warwick

We will seek global input through the ILCOR network of Resuscitation Council’s to identify world leading neuro-focused researchers. We will prioritise achieving a balance of young investigators, females and minority members, methodologist / clinical triallist for research design and patients and public.

**8. Timetable for Completion of Paper**

We will be flexible to ILCOR’s timeline and suggest the following timeline

* Approval of Scientific Statement and writing group by ILCOR October 2019
* Identify writing groups in collaboration with ILCOR Resuscitation Councils
* Application to Manuscript Oversight Committee Feb 2019
* Approval by Manuscript Oversight Committee Mar 2020
* Initial followed by monthly teleconferences from April 2020
* Face to face meeting, UK, July 2020
* Draft manuscript to authors Sept 2020 and peer review October 2020

**9. Funding**

We have received funding support for this initiative from the family of the late Mrs Maughan and the Resuscitation Council (UK). These will cover travel, accommodation and catering costs for the proposed face to face meeting in July 2020 and to cover the costs of patient and public involvement throughout the project.