



In-flight cardiac arrest and in-flight cardiopulmonary resuscitation during commercial air travel: consensus statement and supplementary treatment guideline from the German society of aerospace medicine (DGLRM): reply

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To the Editor!

It is with great interest that we read the comments on our guideline [1] concerning the treatment of in-flight cardiac arrest (IFCA). We highly appreciate the dialog, input, and comments by D. Powell and M. Hudson [2], as scientific discourse based on different views is an integral part of evidence-based work.

The guideline not only focusses on IFCA, but also gives additional evidence-based recommendations on how to treat this critical problem during flight. Since not all relevant aspects are covered by currently published literature, both the GRADE and RAND-DELPHI methods were used to gain consent. For this purpose, the guideline group was carefully built up with many experts from different aviation-related fields, i.e., aerospace medicine, emergency medicine, internal medicine, anesthesia, intensive care medicine, cardiology, otolaryngology as well as non-doctor experts (ATP-pilots, CRM trainer, paramedics, and a physicist).

It is clearly NOT the intention of the guideline to encourage passengers to use emergency equipment without qualified instruction. Nevertheless, medical equipment should be marked and should easily be identified. In the case of AED usage, adequate signage has been identified as a major component of an adequate and timely response to out-of-hospital cardiac arrests [3]. Obviously, the odds that most of the crew

could be incapacitated during flight and not be able to guide volunteers are extremely rare. However, we are convinced that medical equipment should be marked with symbols, not only at the location where it is stowed (which is already the case in airplanes), but also on the seat pocket safety card. In our view, it is not beneficiary to state all the equipment or content. Moreover, giving a comment in the safety briefing that emergency equipment IS available on-board may also be sufficient.

In terms of documentation forms, we do agree that it might be difficult to reach a worldwide consensus. However, to borrow from the Chinese, a journey of a thousand miles begins with a single step. We would welcome widespread efforts at harmonizing the documentation forms within the aeromedical and airline communities, as this would constitute a significant improvement on the way to building databases on in-flight medical problems. Large trauma or resuscitation registries, in the age of big data analysis, are already demonstrating their potential for the adaptation of treatment strategies and optimization of the delivery of medical care [4].

Concerning CPR, high quality of compressions is a prerequisite for a beneficial outcome. If medical professionals are on-board, they should be involved in CPR. Whether manual CPR is performed by them directly, or if they maintain a supervisory role, will depend on the individual situation; however, is it likely that this may lead to superior treatment in some situations. We do agree that cabin crew can also perform CPR, but only if trained properly and regularly.

Amiodarone and IO needles constitute indispensable second-line material for CPR for refractory ventricular fibrillation or impossible IV access, and they are recognized as such in the current guidelines of the European Resuscitation Council (ERC) [5]. They are cheap and have proven to be easy to use [6], and we strongly suggest they be made

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available to support caregivers in the already resource-constrained environment on-board [6], especially when flying several hours away from the next airport.

Once again we thank Dr. David Powell and Dr. Martin Hudson for their constructive and helpful comments and we look forward to further discourse on this topic to improve the outcome of our passengers who became patients.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Statement of human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent None.

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