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## When to Start (and Not Stop) Resuscitation Efforts



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One of the most difficult moments faced by anaesthetists and other healthcare staff is when to carry on attempts to resuscitate a person, and when those efforts should reasonably stop. This dilemma is the subject of a session at Euroanaesthesia, the annual congress of the European Society of Anaesthesiology (ESA).

In the first part of the session, Dr Jose Solsona, Director of the ICU Department and Chair of the Ethics Committee at Hospital del Mar, Barcelona, Spain, will outline scenarios in which it is advised not to begin cardiopulmonary resuscitation (CPR) efforts, including in so called 'living will' situations. He will discuss the poor survival figures for CPR: 8% overall and 20% if done in-hospital (however 90% of CPR efforts take place outside hospital).

If the healthcare worker has themselves witnessed the cardiac arrest, then CPR should be started; however, if not, then whether or not to start depends on whether there was a witness to say when the arrest occurred. Should this be more than 10 minutes ago, CPR should not be started. If no-one has witnessed the arrest or there is any doubt, then CPR should be started. "CPR should also not be started if it presents a risk to the medical personnel," adds Dr Solsona, giving the example of a cardiac arrest occurring in a swimming pool, and the attending doctor not being able to swim.

If the patient (for example in hospital) has made clear that they do not wish to be resuscitated by making a so-called 'living will', the clinician must be satisfied that a patient is capable of making their own decisions, and be able to communicate, understand, know the consequences, and be able to reason. The disparity between living wills and clinical decision was illustrated in a survey of physicians using six hypothetical scenarios.

Physicians decided differently from the patient's directives in 70% of cases (according to data published by The Archives of Internal Medicine) "An exception may be made in patients with depression, since such patients must be considered not competent to make important decisions, like whether to be revived by CPR," says Solsona. He will also outline an example case where it could be difficult to interpret a clear living will. He will describe a patient with AIDS who is hospitalised after a serious road accident. While administering CPR, the staff discover a living will asking not to administer CPR. "But how are the staff to know if the person meant this just for the final part of their AIDS illness? They may have been prepared for death in the near future, but if an unexpected accident brings that day forward, would the person want to be revived, so that they can, for example, say goodbye to relatives and friends? The person could go on to live for years, as we don't know their life expectancy in this situation."

He will also discuss the use of a proxy: where the patient nominates a close relative or friend to represent their views if they are unable to do so themselves. "Preliminary results from my own hospital suggest that only half of patients wish to nominate a proxy," says Solsona. "This could possibly be because the person thinks death is very close, and does not want to talk about it."

Dr Solsona will also state that, even in the presence of family of the patient, anaesthetists or other medical staff in a public hospital system are under no obligation to begin or continue what are reasonably regarded by the doctors as futile CPR efforts. And despite evidence from a recent New England Journal of Medicine Paper that family members witnessing CPR efforts meant those family members suffered less anxiety and depression, and did not interfere in medical efforts, Dr Solsona will argue that their presence introduces an unknown variable that medical staff should not be exposed to while treating the patient (since some could react very badly and cause stress and anxiety to the medical team).

"While no patient whose death is preventable should die, the vast majority of resuscitation attempts fail and the patient subsequently dies," says co-presenter Dr Janusz Andres of Jagiellonian University, Krakow, Poland, Chairman, Department of Anaesthesiology and Intensive Therapy at Jagiellonian University Hospital, Krakow, and President of the Polish Resuscitation Council.

Resuscitation guidelines indicate that after 20 minutes of ineffective resuscitation, the resuscitation team leader, most often an anaesthetist, has to decide whether to stop resuscitation, taking into account several potentially reversible causes of cardiac arrest. "Good neurological outcome is the main goal and the success of resuscitation," says Dr Andres. "Immediate, uninterrupted chest compressions and early defibrillation in cardiac

arrest if indicated are main requirements of success in every case."

It is obligatory in every resuscitation attempt – in out- and in-hospital scenarios - to monitor the quality and efficacy of the ongoing resuscitation. The measuring of the levels of carbon dioxide exhaled by the patient (the method called "continuous capnography") during resuscitation indicates presence of pulmonary blood flow during resuscitation and might predict the probability of ROSC (Return of Spontaneous Circulation). Direct arterial systolic and diastolic pressures (arterial relaxation pressure) are of unique values for the monitoring of resuscitation quality. If a central venous line is available, coronary perfusion pressure (difference between aortic pressure and right atrium pressure) can be calculated. Central venous and arterial blood saturations as well as an arterial blood gas analysis and echocardiography could also be used in periods of prolonged resuscitation, especially in the hospital. Dr Andres will discuss two recently published cases of the prolonged and successful resuscitation. The first one documents (Mayo Clin Proc. 2011;86:544) the longest duration (96 minutes) of pulselessness in the out-of-hospital cardiac arrest with a good neurological outcome. The second case deals with sudden unexpected cardiac arrest during anaesthesia (Can J Anesth 2012;59:578) treated by almost one hour of successful resuscitation in the operating room in the conditions when the decision to terminate resuscitation was being discussed.

"The extension of resuscitation efforts should be considered when the available monitoring indicates the reversibility of cardiac arrest, as well as in other cases that indicate life could be sustained," says Dr Andres. "These include extraordinary situations when we plan to use extracorporeal circulation, the presence of persistent ventricular fibrillation during resuscitation, temporary return of spontaneous circulation, young age of the patient, and evidence of organ perfusion."

He calls for anaesthesia-related advanced life support guidelines to be issued in support of existing resuscitation guidelines (Eur J Anaesthesiol 2013;30:95).

"So far the vast majority of resuscitation efforts have to be limited and then stopped. These include irreversible causes of cardiac arrest like in severe trauma, long lasting asystole (flat lining of the heart's electrical activity despite ongoing advanced life support); the time before resuscitation beginning being too long to have a reasonable chance of succeeding, or poor functional pre-arrest status of the patient like in end-stage cardiac failure," concludes Dr Andres.

Source: [EurekAlert!](#)

Published on : Thu, 6 Jun 2013