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Defibrillators: From Science to Guidelines

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Dr Nolan previews the new European Resuscitation Council guidelines to be published in December, which reflect an international consensus on state of the art resuscitation practice.

Introduction

New guidelines for resuscitation will be published by the European Resuscitation Council (ERC) and American Heart Association (AHA) on 13th December 2005. The existing ERC resuscitation guidelines were derived from the Guidelines 2000 for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) (AHA in collaboration with International Liaison Committee on Resuscitation 2000; de Latorre et al. 2001; Handley et al. 2001; Monsieurs et al. 2001; Phillips et al. 2001-3). Resuscitation science, particularly defibrillation technology, continues to advance and clinical guidelines must be updated regularly to reflect these developments and advise healthcare professionals on best practice. The new guidelines have been derived from an extensive review of the science by almost 300 experts from 18 countries.

Consensus on Science

The International Liaison Committee on Resuscitation (ILCOR) was formed in 1993 (The Founding Members of the International Liaison Committee on Resuscitation 2005). Its mission is to identify and review international science and knowledge relevant to CPR, and to offer consensus on treatment recommendations. The process for the latest resuscitation guideline update began in 2003, when ILCOR representatives established six task forces: basic life support (BLS); advanced life support (ALS); acute coronary syndromes; paediatric life support (PLS); neonatal life support (NLS); and an interdisciplinary task force to address overlapping topics, such as education. Each task force identified topics requiring evidence evaluation and appointed international experts to review them. To ensure a consistent and thorough approach, a worksheet template was created containing step-by-step directions to help the experts document their literature review, evaluate studies, determine levels of evidence, and develop recommendations (Morley and Zaritsky 2005). A total of 281 experts completed 403 worksheets on 276 topics. The worksheets were posted on the Internet for public review and comment in December 2004 (www.c2005.org); at the time of writing, they can still be viewed at this website. Two hundred and forty nine worksheet authors from 18 countries attended the 2005 International Consensus Conference on ECC and CPR Science with Treatment Recommendations, which took place in Dallas, Texas in January 2005. Worksheet authors presented the results of their evidence evaluations and proposed summary scientific statements. After discussion among all participants, these statements were refined and, whenever possible, supported by treatment recommendations. These summary science statements and treatment recommendations will be published simultaneously in the journals *Resuscitation* and *Circulation* in November 2005 (International Liaison Committee on Resuscitation 2005-1-2).

Consensus on Science for Defibrillation

Defibrillation topics that were reviewed and debated at the 2005 Consensus Conference included: CPR before attempted defibrillation, the optimal waveform for defibrillation, the optimal energy level for defibrillation, oneshock versus three-shock strategy for defibrillation, public access defibrillation, and in-hospital use of automated external defibrillators (AEDs). Several of these defibrillation topics were particularly controversial, often because high-level evidence was lacking.

Science to Guidelines

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The resuscitation organisations forming ILCOR, e.g. ERC, AHA, will publish individual resuscitation guidelines that are consistent with the science in the consensus document, but will also consider geographic, economic and system differences in practice, and the availability of medical devices and drugs. The ERC Guidelines for Resuscitation 2005 will represent consensus among members of the ERC Executive Committee.

Guidelines for Defibrillation

In the ERC Guidelines for Resuscitation 2005, defibrillation topics will be covered in two sections: electrical therapies, and BLS and the use of AEDs. A section on PLS will include guidelines on defibrillation for children. The defibrillation guidelines take into account the first shock efficacy of modern biphasic defibrillators and data on the decreasing probability of successful defibrillation associated with interruptions in chest compressions (Eftestol et al. 2002).

Dissemination of the New Guidelines

In addition to the full version, an abridged version of the guidelines will be published as a pocket book. The guidelines are being incorporated into training materials, and revised resuscitation courses (ERC ALS Course, ERC BLS and AED Course, European PLS Course, NLS Course) will be available by Spring 2006. Individual healthcare organisations will need to determine how and when they wish to adopt the practices reflected in the new guidelines; clearly, this will vary with local circumstances.

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