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## International collaboration in resuscitation medicine

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*Researchers from many countries, publishing in multiple languages, are building the scientific foundation for resuscitation practice. Universal guidelines will follow if we can find a way to gather all this information in one location and decide what it all means.*

Douglas Chamberlain and Richard O. Cummins, founding cochairs of the International Liaison Committee on Resuscitation

For more than a decade, an international collaboration of clinicians and researchers has tried to identify, evaluate, and interpret the most valid resuscitation science. This issue of *Resuscitation* (simultaneously published in *Circulation*) presents these collaborators' latest attempts to reach consensus on what the science means and what resuscitation practices should follow. We have not reached our goal of universal resuscitation guidelines, but we have made a worthy attempt. Building on the International Guidelines 2000 Conference on CPR and ECC,<sup>1</sup> in January 2005 a total of 380 experts reviewed 276 resuscitation topics, digested countless peer-reviewed publications, and participated in six days of almost continuous discussion and debate. Particular attention was paid to disclosure of potential conflicts of interest and identification of topics that lacked good evidence to support current practice.

We can trace the pedigree of these efforts over half a century. The original reports of rescue breathing<sup>2</sup> and closed-chest compressions<sup>3</sup> and

the effective combination of the two<sup>4</sup> created an immediate demand for CPR training and performance guidelines. In 1966, the Institute of Medicine convened the first conference to specifically review the evidence and recommend standard CPR and ECC techniques.<sup>5</sup> The American Heart Association sponsored subsequent conferences in 1973 and 1979.<sup>6,7</sup> Parallel efforts occurred internationally as other resuscitation councils faced a growing demand for training in this strange new technique of compressing the victim's chest and blowing into the victim's mouth.<sup>8</sup> Inevitably variations in resuscitation techniques and training methods began to emerge from one country to another.

With continued development of new drugs and medical devices, resuscitation leaders identified many questions that needed answers. At numerous small national conferences, they asked whether answers might already exist in other countries, published in both English and non-English language scientific journals. Increasing awareness of variations in resuscitation practices between countries sparked interest about gathering international experts at a single location. The AHA convened such a meeting in 1985, inviting resuscitation leaders from many countries to observe the AHA's review of standards and guidelines for CPR and ECC.<sup>9</sup> Passive observation by these international guests lasted only through opening introductions: these multinational experts, passionately devoted to improving resuscitation outcomes, soon demonstrated an ability to generate both heat and light.

By 1992, when the AHA convened the next Guidelines Conference, more than 40% of the participants were from outside the United States.<sup>9</sup> During this 1992 conference, a panel on international cooperation on CPR and ECC endorsed the need to foster a multinational base of evidence for resuscitation practices. What was lacking, however, was a focused mechanism with which to capture and assess this growing body of evidence. That panel strongly recommended that an expanded group of international experts initiate a systematic review of the world's resuscitation literature. Under the leadership of many of these panel members, including Richard O. Cummins, Douglas Chamberlain, William Montgomery, and Walter Kloeck, the International Liaison Committee on Resuscitation (ILCOR) was formed. The founding member organisations of ILCOR were the American Heart Association, the European Resuscitation Council, the Heart and Stroke Foundation of Canada, the Resuscitation Council of Southern Africa, and the Australian Resuscitation Council. These organisations were later joined by the Consejo Latino-Americano de Resuscitación (which now forms part of the Inter-American Heart Foundation) and the New Zealand Resuscitation Council.

With the shared vision of international cooperation, ILCOR began to assess systematically the supportive evidence for resuscitation standards and guidelines. During this project ILCOR experts identified numerous national differences in the practices of basic life support, advanced life support, and pediatric and newborn resuscitation. ILCOR eventually published 18 scientific advisory statements with the goal of explaining, eliminating, or reducing these international variations while endorsing mainly evidence-based resuscitation guidelines.<sup>10</sup>

Between 1992 and 2005 ILCOR has convened 22 official meetings. Guiding these ILCOR meetings was a belief that evaluation of international science by a common group of experts should lead to "the single best set" of evidence-based resuscitation guidelines and practices. This belief permeated the international CPR and ECC evidence evaluation conferences held in 2000 and 2005, as well as several international consensus statements.<sup>11–13</sup> The 2000 Guidelines Conference,<sup>1,14</sup> the first major assembly under the auspices of ILCOR, adopted a sophisticated process for gathering and assessing evidence; this process evolved further in 2005. With practical insight, conference participants determined how to incorporate different levels of evidence into consensus treatment recommendations, with identification of key gaps in knowledge.

The experience of developing evidence-based guidelines forced a reluctant conclusion on the ILCOR leadership: the goal of a single "best set" of international CPR and ECC guidelines was not yet achievable. It was recognised that universal science consensus was achievable but that localisation of the treatment recommendations using regional guidelines and training tools is necessary. Undoubtedly, international cooperation has enabled a more thorough collection and analysis of the evidence. Nevertheless, review and debate of that evidence has not always led to standard training and practice. Some obstacles were encountered in the pursuit of universal guidelines.

1. The available evidence may present an inconsistent, contradictory, or less definitive picture that fails to support universal guidelines. CPR ventilation is one example of this obstacle: fine-tuning the details of ventilation consumed considerable time and energy at the 2000 Guidelines Conference. The experts debated numerous ventilation variables, such as rate, inspiratory pressure, inspiratory duration, inspiratory/expiratory ratios, and optimal airway devices for field and hospital and lay rescuers and professionals. At the 2005 Consensus Conference many of these same resuscitation experts argued that compression-only CPR may be more effective and that perhaps ventilations should be eliminated completely from initial resuscitation actions.
2. For many questions, high-level evidence, preferably in the form of randomised controlled clinical trials, is simply not available and probably never will be, preventing the identification of definitive answers to many questions. For example, what is the best way to train lay rescuers so that they will make a vital intervention, undertake it properly and effectively, and retain the skill for years?

ILCOR and international collaboration has continued to mature. In retrospect, the goal of a single set of universal guidelines is idealistic and premature. Many problems in resuscitation require local modifications and solutions. The common goals of the resuscitation community are more important: reducing rates of morbidity and mortality from cardiovascular disease and stroke. The treatment recommendations in this publication are based on the best science known, and they have been achieved by effective international collaboration. Exponential improvements in communication technology are making international collaborative research and topic review a reality, and when indicated, will enable urgent revisions to current guidelines. We

look forward to this continual review and update of the science and the year 2010, when another international collaborative conference will be convened.

*Our problems in resuscitation are similar the world over, but none of us has a monopoly of wisdom, knowledge, or experience. We must, therefore, continue to work effectively together for the good of all.*

Douglas Chamberlain

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