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Cardiopulmonary resuscitation – headlines from the past, frontlines for the future

The history of cardiopulmonary resuscitation (CPR) has been one of trials and tribulations, including pitfalls, setbacks and progresses. A historical review on mouth-to-mouth ventilation tells us that in order to inflate the lungs of the asphyxiated, the Royal Humane Society in the United Kingdom had recommended bellows since 1782 [1]. The principal determinants for change were aesthetic distaste for mouth-to-mouth contact and the perceived danger of using expired air, although mouth-to-mouth ventilation survived in the practice of some midwives. Following investigations of the late 1820s, all positive pressure ventilation methods were generally abandoned; but not chest compressions. During the mid 1800s, the principles and understanding of the primary need for "artificial respiration" was basically lost, except for various methods of negative pressure ventilation, some of which were in use until the 1940s. Sporadic anecdotal cases of mouth-to-mouth ventilation rescues were documented throughout [1].

In the 20th century, inadequate mechanical inhalators were also tried from 1908, while obstetricians devised indirect methods of expired air ventilation [1]. Anesthetists in the 1940s, described the usefulness of mouth-to-mouth ventilation, and James Elam "re-discovered" it [1]. The "Cold War" stimulated research in the United States into the possibilities of mouth-to-mouth ventilation, and experiments performed in the US and UK confirmed and expanded on the efficacy of mouth-to-tube expired air ventilation. Studies performed in the late 1950s by Gordon, Elam and Safar resulted in the resolution of previous airway problems, established the primacy of mouth-to-mouth ventilation, and incorporated it into an integrated system for basic cardiopulmonary resuscitation. Ready adoption of mouth-to-mouth ventilation in the US was followed by worldwide spread, especially after endorsement from the 1962 international symposium held in Stavanger, Norway [1].

As mouth-to-mouth ventilation has proved to be a concept amenable for training and implementation even among laypersons, the modern concepts of both advanced and layperson CPR are moving ahead, with Scandinavians active in the frontline [2-4]. In this issue, Kramer-Johansen has reviewed milestones in the advancement of CPR during the past 50 years [5]. Exemplified by recent preliminary reports [6-8], the methodological and technical advances are continuously being evaluated – some in despair, some with unreleased potential, others with clear hopes for the future.

Cardiopulmonary resuscitation.

Yet, still, hospital physicians in-training perceive deficits in their training and supervision to care for critically ill patients as cardiac arrest team leaders [9]. In a Canadian study, almost half of the respondents (49%) felt inadequately trained to lead cardiac arrest teams. Many (>50%) felt that the advanced cardiac life support (ACLS) course did not provide the necessary training for team leadership, and a substantial number (40%) reported receiving no additional cardiac arrest training beyond the ACLS course. Only 52% of respondents felt prepared to lead a cardiac arrest team, with 55% worrying that they made errors. Few respondents reported receiving supervision during weekdays (14%) or evenings and weekends (~1%). Very few respondents reported receiving post-event debriefing (6%) or any performance feedback (~1%) [9].

Clearly, additional training involving full-scale simulation, leadership skills training, and postevent debriefing would be most effective in increasing skills and confidence for physicians in training. Further, teaching hospitals and medical schools need to consider including more appropriate supervision, feedback, and further education for residents in their role as cardiac arrest team leaders.

For many people cardiac arrest is a natural ending of a long and productive life.

A substantial number of humans, however, are struck by this event too early in life with tragic consequences for both family and society. Nonetheless, some of the more soft (yet hard to decide) issues in modern CPR is when NOT to resuscitate [10, 11]. Obviously, the various aspects of clinical, technical, educational or ethical issues of modern CPR are likely to keep layperson as health professionals busy for decades to come.

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