Quality of CPR: Current Status and How to Improve it

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Sudden cardiac arrest is the most pressing event among all medical emergencies. The outcomes, despite enthusiastic efforts in cardiopulmonary resuscitation (CPR) for several decades, remain dismal. In an effort to improve cardiac arrest outcomes, recent investigations have focus on the quality of CPR. Does the quality of CPR make a difference in patient outcome? Although there are no randomized controlled trials to answer this question, observation studies in both experimental models and humans all support that the quality of CPR is likely to influence the patient outcome. In the real world, the quality of CPR may be highly variable, and performing “high-quality” CPR is important for resuscitation success.

In recent studies, quality of CPR is often deficient from guideline recommendation in several specific parameters, including chest compression rate, compression death, incomplete chest wall decompression, ventilation rate and “hands-off” time. Specifically, chest compression rates are often less than recommended 100/min, compression death is often more shallow than the minimum 38mm, ventilation rate is higher than that recommended 12-16/min and too much “hand-off” time during CPR.

There are several potential practical solutions for helping to improve poor CPR quality. The first includes the improvement of monitoring and feedback to reduce human error during CPR. By using medical record review, video recording, and automated external defibrillation (AED) records, we can detect management errors in CPR. Through the provision of audio-prompts and devices such as end-tidal CO_2 monitors, and “smart defibrillators”, we can measure CPR characteristics and provide feedback to alert the rescuers to errors such as incorrect chest compression or ventilation rate, inadequate chest recoil, and too much “hand-off ” time. The second involves mechanical devices that can provide chest compression reliable at a set rate and depth. These devices may generate better hemodynamics than manual CPR. The third is that a formal, structured emergency resuscitation team may also help to improve the quality of CPR. The fourth, we should simplify the complex algorithms of basic life support and advanced cardiac life support and educational programs to both laypersons and health care professionals, which will make CPR knowledge and skills easier to learn and practice.

In conclusion, high-quality CPR may improve the outcome of patients with cardiac arrest. The quality of CPR may be highly variable in the real world. By using monitoring and feedback may reduce human error during CPR. Through provision of “sophisticated” CPR devices, may generate better hemodynamics and by organizing a well-structured emergency resuscitation team may also help to improve the quality of CPR. To simplify the CPR guideline and educational program will give rescuers the knowledge and skills that can be readily used in the real world.