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Letter to the Editor

A simple method of performing maximally effective CPR chest compressions

Ward et al.[1] discussed the design and implementation of a wearable training device to improve the effectiveness of cardiopulmonary resuscitation (CPR). However, a recent manikin study of CPR performed by 179 ambulance crews, which analyzed the actual pressure point on the sternum using a sensor positioned over the lower half, found that 90 (50.3%) pressed on the cranial side of the sternum while only 58 (32.4%) compressed within the center area of the sensor (or over the midpoint of the lower half).[2] This technology cannot give feedback to correct this problem. In actual patients, compression would likely have been highly ineffective in 50.3% of cases in which the majority of force was applied over the cranial side of sternum and maximally effective in only 32.4% of cases in which the majority of force was applied over the midpoint of the lower half.

Inspection of chest computed tomography scans suggests the sternum is relatively fixed superiorly at the thoracic inlet (or cranial side of sternum) and moves predominantly at the bottom half during chest compression.[3] Maximal force/depth of compression over the bottom half of the sternum is achieved when the hypothenar eminence of the rescuer's dominant hand[4] (or ulna side of the heel), which applies two thirds of the force, is in contact with the lower half of the sternum adequately below the internipple line but safely above the xiphoid process.[3] To achieve positioning of the ulna side of the heel over the lower half of sternum, the right hand needs to be in contact with the sternum when the rescuer is kneeling or standing on the right side of the patient and the opposite with the left hand in contact with the sternum.

In a recent study, hand width and sternal length were measured to identify the proper hand placement location for effective chest compressions and a simple method of hand placement was developed,[5] which should increase correct hand positioning with or without removing clothing or baring the chest (when an automated external defibrillator is not readily available) because the sternal notch landmark can be located without doing so, reduce time to first compression, consistently allow maximally effective chest compression as a result of ensuring that the ulna side of the heel of the hand in contact with the sternum is adequately positioned over the bottom half, and improve survival with favorable neurological outcome as a result of reducing the time to first compression and improving the depth of chest compression. To achieve correct hand placement from the patients' left side, CPR providers need to place their right little finger at the top of the sternum just below the sternal notch and place the left heel one heel width (or approximately 4 finger widths) of the right hand from the notch. From the patient's right side, CPR providers need to place left little finger just below the notch and place the right heel 4 finger-widths of the left hand from the notch (see Fig. 1).

Fig. 1 – Proper hand placement when kneeling on the patient's right side in which the CPR provider places their left little finger at the top of the sternum just below the sternal notch and places the right heel 4 finger widths of the left hand from the notch.

Conflicts of interest

None declared.

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Eric M. Rottenberg
485 Harley Drive Apt 414, Columbus, OH, 43202-1836, United States

E-mail address: rottenberg.1@osu.edu (E. Rottenberg).

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