PHYSIO CONTROL

Annotated Bibliography: Rescuer Fatigue with CPR

OVERVIEW

Multiple studies demonstrate rescuer fatigue can affect chest compression quality and that the rescuer does not recognize when fatigue CPR affects performance.

Hightower D, Thomas S, Stone CK, Dunn K, March, J. "Decay in quality of closed-chest compressions over time." Ann Emer Medicine. 1995;26:300-303.

The ability of healthcare providers to provide adequate chest compressions deteriorates significantly after a brief period of time (one minute). They generally cannot perceive the onset of compression impairment related to fatigue. This study was done on manikins using a 15/2 compression/ventilation ratio.

Ochoa FJ, Ramalle-Gomara E, Lisa V, Saralegui I. "The effect of rescuer fatigue on the quality of chest compressions." Resuscitation. 1998;37:149-152.

This study, also performed on manikins, confirmed the findings of Hightower, et al: Quality of CPR declined significantly after one minute. Time to reported fatigue was about 3 minutes. Profession, gender, weight and height did not influence the quality of compressions or the capacity to notice when fatigue affects rescuer. This study was done using a 15/2 compression/ventilation ratio.

Greingor JL. "Quality of cardiac massage with ratio compression-ventilation 5/1 and 15/2." Resuscitation. 2002;55:263-267.

The quality of CPR provided by healthcare providers declined significantly after the first minute with a 15/2 ratio compared with 5/1 ratio. This suggests that CPR with a higher compression/ventilation ratio is more tiring. Insufficient compression depth was the most frequent error in both ratios. This study was done using manikins.

Ashton A, McCluskey A, Gwinnutt CL, Keenan AM. "Effect of rescuer fatigue on performance of continuous external chest compressions over 3 min." Resuscitation. 2002;55:151-155.

Healthcare providers performed two consecutive 3-minute periods of continuous compressions separated by a 30-second time interval on manikins. The total number of compressions was maintained (100/min) over both periods of CPR, but the number of satisfactory chest compressions performed decreased to 82 the first minute to only 27 by the sixth minute. Seven subjects were unable to complete a second 3-minute interval due to exhaustion.

Wik L. Kramer-Johansen J, Mykelbust H, et al. "Quality of cardiopulmonary resuscitation during out-of-hospital cardiac arrest." JAMA.2005;293:363-365.

Measured quality of CPR performed by ambulance personnel on patients in cardiac arrest to assess adherence to 2000 CPR guidelines (15:2 ratio). Only 28% of compressions met the guidelines for depth; most compressions were too shallow.

(over)

The compression part of the duty cycle was 42% instead of the recommended 50%. Chest compressions were not given 38% of the time.

Abella BS, Alvarado JP, Mykelbust H, et al. "Quality of cardiopulmonary resuscitation during in-hospital cardiac arrest." JAMA. 2005;293:305-310.

The quality of CPR was inconsistent and often did not meet CPR Guidelines (2000), even when performed by well-trained hospital staff on patients in cardiac arrest. Chest compression rates were less, compression depth was too shallow, and ventilation rates were high.

Abella BS, Sandbo N, Vassilatos P, et al. "Chest compression rates during cardiopulmonary resuscitation are suboptimal: a prospective study during in-hospital cardiac arrest." Circulation. 2005;111:428-434.

Chest compression rates provided by trained healthcare providers in the hospital setting were below the AHA Guidelines (2000) recommended rate and suboptimal compression rates correlated with poor return of spontaneous circulation.

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