

Clinical Summary

Compression feedback devices over estimate chest compression depth when performed on a bed

Perkins GD, Kocierz, L, Smith SCL, et al. *Resuscitation*. 2009;80:79-82.

Purpose:

The primary purpose of the study was to measure the amount of mattress compression compared to chest compression using the Philips®/Laerdal® Q-CPR™ compression sensor on both a foam and inflatable mattress. The secondary purpose was to see if placing a wide and narrow backboard would change the amount of mattress compression.

Methods:

- CPR was performed with a manikin on the floor and on foam and inflatable mattresses with and without a backboard.
- Chest compression depth was measured both by the Q-CPR sensor (accelerometer) and the internal sensors in the Laerdal manikin.

Results:

- Feedback given by the Philips/Laerdal Q-CPR accelerometer consistently coached the rescuer to significant under compression of the chest on foam and inflatable mattresses, with and without a backboard.
- Under compression occurred because the device failed to compensate for mattress compression as part of the total compression depth.
- Compression of the mattress represented 35-40% of the total compression depth.
- Normal compression depth was only achieved when the manikin was on the floor.

Conclusion:

- The use of such sensors may lead to significant under compression of the chest.
- The authors noted, "There is an urgent need for further work to identify methods to calibrate feedback devices to take account of mattress compression during CPR."

Physio-Control Discussion Points:

This study highlights the limitations of accelerometer type sensors on compliant surfaces such as mattresses. Both Philips/Laerdal (Q-CPR) and ZOLL® (RealCPRhelp®) use these type of sensors in defibrillators containing real time CPR coaching and feedback. This issue is a serious one for those who need to perform CPR on a mattress because they may be coached and guided to compression depths that are significantly too shallow.

Physio-Control will continue to introduce thoughtfully designed, evidenced-based solutions that truly improve CPR quality.