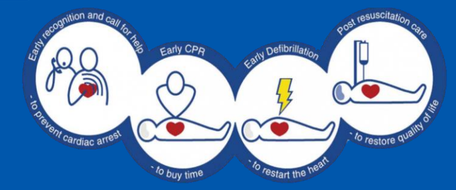
Students' perspectives of Brayden Illuminating CPR manikins following introduction to a medium-large Basic Life Support course at a UK University.

Resuscitation for Medical Disciplines

Authors: Finch A[1]*, Barnett J[1]*, Cato LD[1], Ziopos M-E[1], van Dijk S[1], Hulme J[1,2], Alderman J[1,3†], Owen A[1,3†]

Affiliations: [1] College of Medical and Dental Sciences, University of Birmingham, Edgbaston, Birmingham, UK. B15 2TU
[2] Department of Anaesthesia and Critical Care, Sandwell and West Birmingham Hospitals NHS Trust, West Bromwich, UK. B71 4HJ
[3] Department of Anaesthesia and Critical Care, Queen Elizabeth Hospital Birmingham, UK. B15 2GW

UNIVERSITY OF BIRMINGHAM

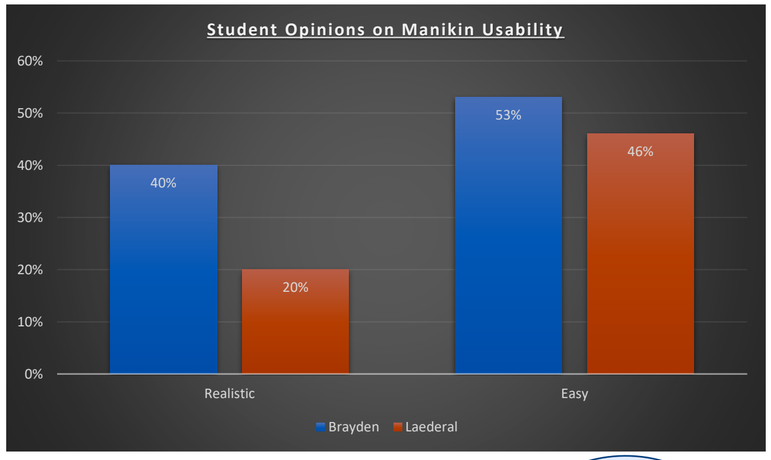


Introduction: In the UK, there are approximately 28,000 cases of out-of-hospital-cardiac-arrest (OHCA) each year. With survival occurring in just 12% of cases, OHCA represents a significant contributor to the burden of mortality which faces the UK health care service. (1) Successful resuscitation requires early, good quality bystander cardiopulmonary resuscitation (CPR) and prompt defibrillation to optimise recovery without disability (2,3). CPR quality might be improved by feeding back to rescuers during resuscitation efforts. (4) The Brayden Illuminating CPR Manikin offers a novel approach, employing LED lights to offer real-time compression rate and depth feedback to candidates during CPR delivery. During training, correct compression depth is indicated by axillary lights, and correct rate by carotid lights. When CPR is delivered together at the correct rate and depth according to ERC guidelines, the manikin's forehead illuminates.

Aims: This study aimed to understand users' opinions toward the Brayden model compared with the industry leader.

Materials and Methods: The study was conducted during basic life support courses at The University of Birmingham, between October 2017 and April 2018. Feedback was collected from both candidates and instructors by questionnaires. A 5 point Likert scale was used to assess usability and reliability (e.g. incidence of manikin malfunction), and a 10 point response scale to assess candidate enjoyment and confidence in CPR performance using each manikin type.

Results Overall the study collected responses from 188 student candidates and 6 instructors. Students reported finding the Brayden model more realistic (40% vs. 20%) and easier to use (53% vs. 46%), when compared to the Laerdal model respectively. Approximately half of candidates using the Brayden model reported it 'easier' to achieve correct rate (47%) and depth (51%). 28% students initially reported confusion regarding the significance of the illumination feedback, however 58% reported good understanding by the end of the course. 66% of instructors reported illumination useful when teaching.



"The lights were **very useful** and reinforced **compression depth & rate"**, (student)

"helpful for those **doing it the first time** but is not if done a similar course before…". (student)

Discussion: It is critical all healthcare professionals are competent and efficient in the delivery of prompt, high quality CPR throughout their career, as outlined in GMC guidelines (5,6). This study evaluates student and instructor opinions of illumination feedback during CPR training in order to fully assess the strengths and weaknesses of this novel addition. The engagement of the instructor or student during training may influence the extent to which skills are acquired and retained.

Delivery of real time feedback by illumination is a novel approach currently only used by Brayden Illuminating CPR manikins. As a result, the student is able to adjust their CPR quality in real time, potentially leading to greater student engagement, enjoyment and hence skill improvement. Furthermore, since the illumination provides feedback with regards to rate and depth, the instructor may have more time to adjust and offer improved feedback to students with regards to CPR technique (e.g. hand positioning), potentially improving the quality of training overall. In addition students will be able to undertake independent learning using the illumination feedback, allowing instructors to manage a larger group of students without compromising on the quality of visual feedback.

Findings should be interpreted with caution: our small sample size makes detailed analysis error prone. Furthermore, responses were only collected directly after training, but the perspective of users in the long term was not evaluated.

Overall, both students and instructors found the addition of illumination during CPR training useful. The impact upon subsequent self-perceived and observed CPR competency still remains unclear. We intend to use these findings to further investigate the utility and impact of Brayden Illuminating CPR manikins both in different populations ranging from adult healthcare student, and in school pupil populations.

Conclusion Overall some candidates found the Brayden Illuminating CPR Manikin useful and enjoyable to use. Initial confusion regarding the significance of the illumination feedback may limit the usefulness of this novel technology and could be reduced with specific briefing prior to use, providing context to the illumination, ensuring students fully understand its significance and derive the most benefit.

References: 1. Perkins GD et al. Variability in cardiac arrest survival: the NHS Ambulance Service Quality Indicators: Figure 1. Emerg Med J. 2012;29(1):3–5 2. Blom MT et al. Improved Survival After Out-of-Hospital Cardiac Arrest and Use of Automated External Defibrillators. Circulation. 2014;130(21):1868–75. 3. Hasselqvist-Ax I et al. Early Cardiopulmonary Resuscitation in Out-of-Hospital Cardiac Arrest. N Engl J Med. 2015;372(24):2307–15. 4. Abella B, Alvarado J, Myklebust H et al. Quality of cardiopulmonary resuscitation during in-hospital cardiac arrest. J Am Med Assoc. 2005;293(3):305-10 5. Tomorrow's Doctors. [Internet]. 2009 [cited 3 November 2017];:22.6. The Trainee Doctor. [Internet]. 2011 [cited 3 November 2017];:46 (d)