



CSMEN – Simulation Publications Update

Bulletin November 2020

Resuscitation and Use of Simulation

Welcome

Welcome to the Simulation Publications Update a service brought to you by CSMEN in partnership with NES Knowledge Services.

The focus for this Simulation bulletin is on how simulation is used in Resuscitation Training. These articles may be of interest or relevance to your current role in NHS Scotland. The articles may also be of use in your research. These articles are from those journals we currently subscribe to. If there are any articles or journals that you would like us to add/consider please let us know.

Until now we have tried to provide approximately 30 links to articles on all aspects of simulation. We are now moving to shorter bulletins focusing on different aspects of simulation.

The articles identified those which used simulation for resuscitation training.

If you would like to suggest a focus topic or become a reviewer, please also let me know.

Jean.ker@nes.scot.nhs.uk

The plan is to widen this service to focus on topic areas and to monitor its use and effectiveness so feedback would be much appreciated.

This bulletin has been developed by Jean Ker clinical lead CSMEN in partnership with Alan Gillies from NES Knowledge Services.

Access to Journals

Different journals have different processes for login so please follow the instructions for accessing the full text of the articles through the links provided.

On your behalf NES Knowledge Services subscribes to some journals direct and others via aggregators (i.e. journal collections or full text databases). We use something called a 'link resolver' to link you via the best route using your NHS Scotland OpenAthens password.

Some journals can detect that you're logging in from NHS premises, so won't ask for the OpenAthens password, but if you're accessing from home you may have to login. None of the links should require you to set up a separate login – where there are login boxes for personal accounts, look for an OpenAthens or 'institutional login' option as well, which will



accept your OpenAthens password.

Focus: Resuscitation and Use of Simulation based Education

[The effectiveness of a new dispatcher-assisted basic life support training program on quality in cardiopulmonary resuscitation performance during training and willingness to perform bystander cardiopulmonary resuscitation: A cluster randomized controlled study.](#)

Park, G.J., et al, Simulation in Healthcare: The Journal of the Society for Medical Simulation, 2020.

This paper from Seoul, South Korea shares a cluster randomised controlled study of a training programme called HEROS (Home Education and Resuscitation Outcomes Study). Out of hospital cardiac arrests are a problem worldwide and many countries, including Scotland, have developed training for the public to decrease response time for performing appropriate CPR and to lessen long term detrimental outcomes. Dispatcher-assisted CPR in which members of the public are supported by instructions over the telephone has been implemented in several communities. They can be especially useful in the home setting in cardiac arrest. The HEROS programme is a simulated programme where BLS instructions from a remote instructor, with a focus on chest compressions, is rehearsed.

A prospective clustered randomised trial was conducted at 3 district communities in Seoul with participants who excluded under 19s and those who had received BLS training in the previous 6 months. In each district participants were randomised into two groups one receiving standard one hour BLS training and the other receiving one hour HEROS training using their own phone to receive instructions while they practised.

QCPR classroom (Laerdal) was used to measure the quality of CPR performance in all participants as well as survey instruments. Sample size was calculated using the intracluster correlation coefficient, the expected effect and the power of the study. The paper shares a useful diagram of the flow of participants through the trial.

A total of 3994 people received CPR training. 25.6% refused to participate in the study. 1044 did not have complete data and so only 1929 were included who were equally distributed between the HEROS and non HEROS groups. The HEROS group quality of CPR was significantly better than the non HEROS group but this was immediately after training and apart from the bias within the participant groups the long term of the impact of the training is still to be answered.

One of the challenges is that the post training survey results reported included those who were not included in the analysis of performance making it challenging to link the data from the QCPR with that of the surveys. What I learnt is that it may be useful to include rehearsal of telephone instructions as part of Heart Start BLS training for the public in the UK.

Professor Jean Ker

Associate Postgraduate Dean, Clinical Skills (CS MEN)



Neonatal resuscitation guideline adherence: Simulation study and framework for improvement.

Binkhorst M., et al, European Journal of Pediatrics, 2020.

The aim of this Dutch study was to assess newborn life support (NLS) knowledge and guideline adherence, and provide strategies to improve (neonatal) resuscitation guideline adherence. Pediatricians completed 17 multiple-choice questions (MCQ) and performed a simulated NLS scenario, using a high-fidelity manikin. A framework was created, based on the study and the existing literature, providing strategies to enhance professionals' knowledge, skills, self-efficacy, and team performance, as well as recommendations regarding equipment, environment, and guideline development/dissemination.

Impact of simulation-based training on basic life support in improving the knowledge and skills of fire and rescue services personnel.

Daniel R. & Daniel, E., National Journal of Physiology, Pharmacy and Pharmacology, Vol 10, 6, 478-483. 2020.

The aim of the study was to assess the knowledge and skills of fire and rescue services (FRS) personnel in India in providing BLS, before and after undergoing simulation-based BLS training. It found a statistically significant difference between pre-test and post-test scores in all participants.

The effect of 10-min dispatch-assisted cardiopulmonary resuscitation training: A randomized simulation pilot study.

Fukushima, H., et al, International Journal of Emergency Medicine, Vol 13, 1, 31. 2020.

Immediate bystander cardiopulmonary resuscitation (CPR) is essential for survival from sudden cardiac arrest (CA). Current CPR guidelines recommend that dispatchers assist lay rescuers performing CPR (dispatch-assisted CPR (DACPR)), which can double the frequency of bystander CPR. Laypersons, however, are not familiar with receiving CPR instructions from dispatchers. The aim of this study was to determine the effectiveness of simple DACPR training for lay rescuers. It found that DACPR training in addition to standard CPR training can result in a modest improvement in the time to initiate CPR.

Annie, Annie! are you okay?: Faces behind the Resusci Anne cardiopulmonary resuscitation simulator.

Gordetsky, J.B., et al, Anesthesia & Analgesia, 657-659. 2020.

This article investigates the history of Resusci Anne, the well-known cardiopulmonary resuscitation (CPR) simulation trainer. The creation of Resusci Anne began with Peter J. Safar, an accomplished anesthesiologist who experimented with resuscitation of respiration and cardiac function. He collaborated with Asmund S. Laerdal, whose early experimentation with soft plastics allowed him to create a human simulator that could be used to teach the skills of resuscitation to both medical care practitioners and individuals of all walks of life. A special face was chosen for the simulation mannequin, one based on a mysterious death mask of a beautiful woman from the late 19th century. The success of Resusci Anne led to the widespread acceptance of CPR and simulation use in medical training.

Video analysis of newborn resuscitations after simulation-based helping babies breathe training,

Haug, I.A., et al, Clinical Simulation in Nursing, Vol 44, 68-78. 2020.

Simulation-based Helping Babies Breathe (HBB) training is currently rolled-out in around 80 low-income countries with various results. Workflow was analyzed in 76 video-recorded newborn resuscitations performed by regularly HBB-trained nurse-midwives over 3 years in rural Tanzania. The study found that: video analysis revealed a gap between clinical practice and the HBB guideline; start of ventilation was delayed, and ventilation was commonly interrupted; more time were spent on stimulation and suction, than recommended by HBB; there were few differences in treatment of surviving newborns vs. those who died; several nurse-midwives were working together in most of the resuscitations. The authors recommend that HBB training



should focus more on urgency, ventilation skills, and teamwork; and clinical debriefings can be an important addition to frequent HBB training.

[EAST multicenter trial of simulation-based team training for pediatric trauma: Resuscitation task completion is highly variable during simulated traumatic brain injury resuscitation.](#)

Jensen, A.R., et al, American Journal of Surgery, 1057-1064. 2020.

Best practices for benchmarking the efficacy of simulation-based training programs are not well defined. This study sought to assess feasibility of standardized data collection with multicenter implementation of simulation-based training, and to characterize variability in pediatric trauma resuscitation task completion associated with program characteristics. The study concluded that multicenter implementation of a standardized pediatric trauma resuscitation simulation scenario is feasible. Standardized data collection showed wide variability in simulated resuscitation task completion.

[Saving lives and improving the quality of pediatric resuscitation across the world: a 1-day research accelerator hosted by the International Network for Simulation-based Pediatric Innovation, Research, and Education and the International Pediatric Simulation Society.](#)

Kessler, D.O., et al, Simulation in Healthcare: The Journal of the Society for Medical Simulation, 295-297. 2020.

The purpose of the meeting was to bring together healthcare simulation scientists with resuscitation stakeholders to brainstorm strategies for accelerating progress in the science of saving pediatric lives from cardiac arrest. Teams developed a pitch and presented a sample request for proposals to a panel of expert judges, making a case for why their domain was the most important to create a funding opportunity. The winner of the competition had their specific request for proposal turned into an actual funding opportunity, supported by philanthropy that was subsequently disseminated through International Network for Simulation-based Pediatric Innovation, Research, and Education as a competitive award.

[Effect of monitor positioning on visual attention and situation awareness during neonatal resuscitation: A randomised simulation study.](#)

Law B.H.Y., et al, Archives of Disease in Childhood: Fetal and Neonatal Edition, Vol 105, 3, F285-F291. 2020.

This study aimed to compare situation awareness (SA), visual attention (VA) and protocol adherence in simulated neonatal resuscitations using two different monitor positions. In a simulation lab at the Royal Alexandra Hospital, Edmonton, Canada healthcare providers (HCPs) were randomised to either central (eye-level on the radiant warmer) or peripheral (above eye-level, wall-mounted) monitor positions. During simulated neonatal resuscitation, monitor position did not affect SA, VA or protocol adherence.

[Stress testing the resuscitation room: Latent threats to patient safety identified during interprofessional in situ simulation in a Canadian academic emergency department.](#)

Mastoras, G., et al, AEM Education & Training, 254-261. 2020.

As part of a new interprofessional education and quality improvement initiative, this prospective, observational study sought to characterize latent safety threats (LSTs) identified during the delivery of in situ, simulated resuscitations in an emergency department (ED). In situ simulation (ISS) sessions were delivered on a monthly basis, during which a variety of scenarios were run with teams of ED health care professionals. The authors conclude that ISS, beyond its role as a training tool for developing intrinsic and crisis resource management skills, can be effectively used to identify system issues in the ED that could expose critically ill patients to harm.

[The effectiveness of a new dispatcher-assisted basic life support training program on quality in cardiopulmonary resuscitation performance during training and willingness to perform](#)



bystander cardiopulmonary resuscitation: A cluster randomized controlled study. Park, G.J., et al, Simulation in Healthcare: The Journal of the Society for Medical Simulation, 2020.

A new dispatcher-assisted basic life support training program, called "Home Education and Resuscitation Outcome Study (HEROS)" was developed with a goal to provide high-quality dispatcher-assisted cardiopulmonary resuscitation (CPR) training, with a focus on untrained home bystanders. This study, conducted in Seoul, aimed to determine whether the HEROS program is associated with improved quality in CPR performance during training and willingness to provide bystander CPR compared with other basic life support programs without dispatcher-assisted CPR (non-HEROS). It found that the HEROS training program helped trainees perform high-quality CPR throughout the course and enhanced their willingness to provide bystander CPR.

The use of immersive and virtual reality technologies to enable nursing students to experience scenario-based, basic life support training-exploring the impact on confidence and skills.

Rushton, M.A., et al, CIN: Computers, Informatics, Nursing, 281-293. 2020.

Some nurses still lack confidence and skills to perform basic life support in an emergency situation. This innovative study included 209 participants, used a mixed-methods approach, and examined three environments to compare confidence and skills in basic life support training. The environments were nonimmersive (basic skills room), immersive (immersive room with video technology), and the Octave (mixed reality facility). The study identified that placing students in an unfamiliar environment influences the confidence and skills associated with basic life support; this could be used as a way of preparing student nurses with the necessary emotional resilience to cope in stressful situations.

Use of simulation as a needs assessment to develop a focused team leader training curriculum for resuscitation teams. Zern, S.C., et al, Advances in Simulation, 6. 2020.

This article reports on the effectiveness of a simulation-based training program for residents designed using unannounced in-situ simulation cardiac arrest data as a needs assessment. Prior to instruction, residents were assessed in their ability to lead a simulated resuscitation using a standardized checklist. During the intervention phase, residents participated in didactic and team training. The didactic training consisted of pharmacology review, ACLS update and TeamSTEPPS training. Residents took turns as code team leader in three simulation sessions. Rapid cycle deliberate practice (RCDP) was employed as part of simulation sessions. The study found that the simulation-based training program developed as a result of the needs assessment significantly improved resident performance as team leader. The authors conclude that in-situ simulation is a promising tool for curriculum development.