Using high-fidelity simulation for critical event training

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What problems were addressed? Paediatric emergencies are infrequent, but can rapidly become disastrous as the limited reserve of the paediatric patient may afford only seconds for the making of appropriate clinical decisions. Operating room (OR) staff are essential to ensuring the appropriate initial steps to stabilise the patient are taken.

Unfortunately, many staff do not have critical care training, which leads to discomfort during paediatric emergencies that may result in potentially deleterious delays in initial stabilising measures.[1]

What was tried? We developed an educational programme utilising high-fidelity simulation (HFS) and workshops to improve efficiency, competency and comfort in assisting with perioperative critical events. We created a survey to assess the staff's educational backgrounds in paediatric critical events and to provide a needs assessment on which to base the structure of our curriculum. In six teams of two, 12 paediatric OR staff (the majority of whom were not trained in paediatric advanced life support skills) underwent an introductory session in the form of an HFS of an intraoperative paediatric emergency during which an inexperienced anaesthesiology resident was alone while the attending physician was in another OR. The scenario lasted approximately 5 minutes and involved airway management and recognition of a rhythm change that required defibrillation. Immediately following the HFS, participants attended an educational session that focused on code cart use, common emergency drugs and use of the defibrillator. Participants were given hands-on time to experiment with the varying functions of the defibrillator including cardioversion, pacing and unsynchronised defibrillation. One month after this session, the group participated in a second HFS, which was comparable with the first scenario in terms of skill requirement.

What lessons were learned? We received positive feedback about HFS training, as well as evidence showing performance improvement. After the training, the participants reduced the time to obtain the code cart (127 seconds versus 84 seconds; $p = 0.001$), to attach the pads (62 seconds versus 45 seconds; $p = 0.046$), and to defibrillation (62 seconds versus 37 seconds; $p = 0.035$). The total time from obtaining the code cart to completion of defibrillation decreased from 251 seconds to 167 seconds ($p = 0.0001$). There was also improvement in the recognition of asystole among the groups (none of six groups in session 1 versus four of six groups in session 2) and in initiating compressions (two of six groups in session 1 versus four of six groups in session 2), although these differences were not statistically significant. All groups were able to identify the correct Joules for defibrillation during the second session ($p = 0.015$). These results suggested that HFS, which provides repetition of infrequent clinical situations, can be a useful tool to reinforce paediatric critical event clinical skills in a safe learning environment. When starting simulation with a new group, especially for those who are unfamiliar with the simulation environment, it is important to plan a buy-in procedure such as a pre-training needs assessment survey. It is also crucial to focus on the reinforcement of specific skills and to reassess these for evidence of the learning of the task.

REFERENCE

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