Design of a functionally equivalent mental simulation protocol for learning cardiac arrest skills [Abstract only]

WHITE, Nick, GARNER, Iain and RUMBOLD, James <http://orcid.org/0000-0002-1914-1036>

Title: Design of a functionally equivalent mental simulation protocol for learning cardiac arrest skills

Background and objectives: mental simulation assists learners in repetitive, solitary, deliberate practice. Mental stimulation can complement simulation laboratory learning and clinical practice in learning skills and increasing self-efficacy [1]. Mental simulation is a quasi-sensory or quasi-perceptual experience without stimuli and overt physical movement. Mental simulation occurs when one imitates actions in an imaged state but does not trigger the action itself [2]. Mental simulation is based on the 'simulation theory of action'. This theory suggests that observing an action, imaging an action, or understanding an action will activate the neural networks involved in the actual execution of that action. While these states differ, there is a partial overlap between covert and overt action [2]. The images produced during mental simulation must be vivid or high fidelity to activate the said neural networks. Higher fidelity images create greater 'functional equivalence', increasing the likelihood that the imager will learn from their experience [3].

Aim: the aim was to create a mental simulation protocol rich in motor and sensory cues that would assist pre-registration nurses [students] in imagining performing cardiac arrest skills. The protocol had to be designed to increase the mental simulation exercise's functional equivalence and increase the possibility that learning would take place.

Methods: the protocol had several elements to improve functional equivalence, and these were: i) a narrated audio script with embedded sound effects that described the scenario. The script was based on PETTLEP mental simulation framework (physical, environment, task, timing, learning, emotion & perspective) [3]. The author used a tripartite script design. The scripts were designed between 1) the [first] author, 2) the [2015] BLS and ALS guidelines and 3) students with real-world cardiac arrest experience; ii) a first-person [1-P] film of a cardiac arrest to assist in evoking high-fidelity images from a 1-P perspective; iii) a patient back story; iv) resuscitation algorithms and v) a glossary of terms to help inexperienced students to understand cardiac arrest terminology. The glossary would assist students in turning language into images.

Findings: this novel approach to creating a mental simulation protocol created a scenario rich in detail and rich in stimulus, response and meaning cues that could help students learn cardiac arrest skills outside the simulation laboratory.

Conclusion: this is a new and novel way to design mental simulation protocols for learning cardiac arrest skills outside the laboratory.

1. Geoffrion R, Gebhart J, Dooley Y, Bent A, Dandolu V, Meeks R, et al. The mind's scalpel in surgical education: a randomised controlled trial of mental imagery. Int J Obstet Gy. 2012 June;119(9):1040-48.

2. Jeannerod M. Neural Simulation of Action: A Unifying Mechanism for Motor Cognition. NeuroImage Clin. 2001 July;14(1 pt. 2):S103–09.

3. Holmes P S, & Collins D J. The PETTLEP Approach to Motor Imagery: A Functional Equivalence Model for Sport Psychologists. J. Appl. Sport Psychol. 2001 May;13(1):60-83.