A Comparison of High, Medium and Low Fidelity Simulation for Advanced Cardiac Life Support (ACLS) Training

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The traditional model of surgical education has been practice-based learning in which valuable psychomotor skills are acquired by repeatedly performing the same task under supervision until one becomes proficient. Over the last two decades, medical education and, by extension, the teaching of surgical techniques have undergone a shift towards the increased use of simulation. Various models are used to re-create the patient care environment and mimic the surgical techniques that need to be mastered by every surgeon. With simulation these skills can be learned in a safe, controlled environment. The simulators used have varying degrees of realism or as it is called in the fields of scientific modeling: “fidelity.”

Improved technology has led to the development of an ever-increasing number of high fidelity simulators which more accurately mimic the real environment and are even capable of responding to input from the trainee. These high-fidelity simulators tend to cost much more than their low fidelity counterparts and are often cumbersome to set up. However, it is the generally accepted belief that benefits justified the cost.

While research has shown that simulation is beneficial with respect to learning, the question of how much fidelity is actually needed for adequate learning still needs to be answered.

Our research study is designed to evaluate the effect of different fidelity simulators (low fidelity vs medium fidelity vs high fidelity) on learning as it applies to the ACLS core cases (Ventricular fibrillation/Pulseless Ventricular tachycardia, Pulseless electrical activity /Asystole, Bradycardia, Tachycardia). We intend to evaluate what level of simulation fidelity is necessary for adequate learning to take place. Further, we hope to delineate at what level does added simulation fidelity become excessive, since high fidelity simulation is both expensive and time-consuming. Depending on the results of our study we hope to effect changes in our surgical education curriculum with respect to how we teach residents ACLS skills. We believe that we will also be able to extrapolate our results to other surgical education topics within our curriculum. It is our hope that we can use this research to help guide effective resource management as we continue to develop and improve our surgical education program.