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The role of simulation in health professions education: Applications of motor control and learning theory

There has been a move toward a shorter workweek for surgical residents and an emphasis on operating room efficiency, both of which diminish teaching time. Yet the patients in our teaching hospitals are generally much sicker and have more complex problems than in times past. The increasing complexity of cases and a greater emphasis on mitigating medical error limit a faculty's latitude in assisting residents with technical procedures. Sheer volume of exposure, rather than specifically designed curricula, is the hallmark of current surgical training. But as opportunities for learning through work with "real" patients have diminished, interest in simulation with validated simulators, trained educators and formal curricula, specifically designed to teach surgical skills, has increased dramatically. In this new model of surgical education, basic surgical skills are learned and practiced on models and simulators, with the aim of better preparing junior trainees for the real operating room experience.

A body of research is emerging that has examined the role of simulation in the training of surgeons and other health professionals and if these studies are looked at collectively, the conclusion is that when integrated into a curriculum, simulation leads to both the learning of technical skills, and to improved clinical performance. The field has moved past the debate regarding whether or not simulation can enhance learning; and is now addressing the best way to use simulation to maximize the learning of technical clinical skills. In this presentation basic principles of simulation in the field of health professions education will be discussed. As well, several studies will be presented that demonstrate how a basic understanding of haptic perception and motor control are necessary for simulator design. In addition, there will be an application and evaluation of basic motor learning principles to technical skills training curricula.

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