Surgical Simulation and Competency

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KEYWORDS

• Surgical training • Simulation • Competency • Hysterectomy • Education

KEY POINTS

- Simulation in surgical training is prevalent in obstetrics and gynecology training programs but not yet as part of a standardized curriculum.
- Evidence shows that simulation-based training improves knowledge and skill acquisition.
- Simulation-based competency assessment should specifically target the type of skills or knowledge to be assessed.
- When hysterectomy is viewed within a framework of increasing levels of competencies, different types of simulation can be used to help learners gain competencies until procedural mastery is achieved.

INTRODUCTION

In the 1800s, Dr Halsted at Johns Hopkins School of Medicine pioneered the first surgical training program in the United States. Surgeons were trained in the classical apprenticeship model of surgical training, and subsequent generations of surgeons were successfully trained in this model. However, since the 1990s, there have been several social and technological changes that questioned the philosophy of "see one, do one, teach one." These factors include concerns for patient safety, new duty hour restrictions for trainees, the introduction of new procedures and technologies, and the need for cost containment in the health care system.[1–4] All these factors culminate in an environment that may reduce teaching and learning opportunities in the operating room (OR) for trainees. Dimitris and colleagues[5] found that there has been a decrease in procedures performed and clinical encounters by surgical residents in the period after implementation of duty hour restrictions in the United States. At the same time, there has been a shift away from a time-based system of residency programs to a competency-based system. Specific to obstetrics and gynecology (OBGYN), resident hours are split between obstetric experience and gynecologic

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surgical training. Because so many hours are spent focusing on the acquisition of obstetric skills, residents in our specialty spend fewer months on surgical rotations per year than their counterparts in training programs of other surgical disciplines.[6]

Simulation has been proposed as a solution to the apparent conflict of improving patient safety while ensuring adequate opportunities for trainees to gain proficiency in surgical procedures. It has been shown that patients are more willing to allow trainees to perform procedures if they already have competency with simulators.[7] The ethics of allowing trainees to perform procedures is a complex balance of the principles of beneficence, nonmaleficence, and truth (**Fig. 1**). Although there is the need to provide best possible care, the patient more often believes such care is provided by the individual surgeon exclusively in the OR. In reality, such care is often provided in teaching centers by a combination of faculty and the surgical trainees, albeit under direct supervision of the surgeon. Surgical simulation can help ease the conflict between providing safe care, meeting the learning goals of trainees, and preserving truthfulness in the therapeutic relationship.

OPTIONS FOR SURGICAL SIMULATION

Simulation in surgery can take many forms (**Box 1**), which are described further below.

Animal and Human Cadaver Simulation

Animal and cadaver laboratories are the first examples of simulation in surgery. Advantages include high face validity in terms of anatomy, haptics, and tissue quality. However, changing values, ethics, and regulations around the use of animal and cadaveric tissue has resulted in much more expense and difficult access for such simulation. Many residency training programs may only be able to offer trainees exposure to either live animal or cadaver simulation laboratories and only infrequently during the course of their residency (Ari Sanders, MD, personal communication, 2016, Calgary, Alberta).

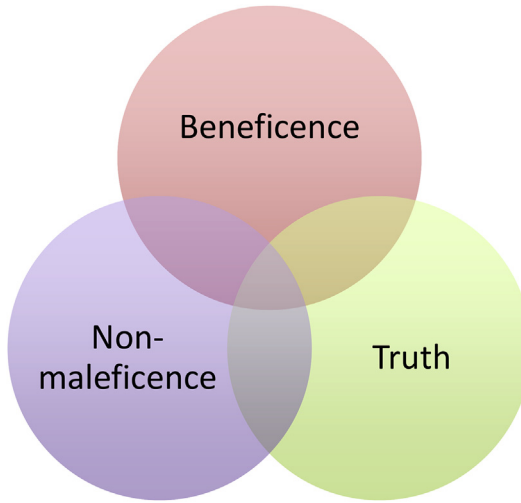

Fig. 1. Ethical issues in surgical training and patient safety.