INTRODUCTION

• After college, medical students have two years of pre-clinical studies followed by two years of clinical rotations. Usually, the rotations consist of mainly observation with infrequent, inconsistent opportunities to practice/perform skills, largely due to students’ lack of experience. Consequently, valuable time is spent during residency learning basic skills.

• If students begin learning procedural skills earlier, during undergraduate education, then they could acquire skills to a degree that would enable them to perform the procedures during their clinical rotations.

MATERIALS & METHODS

• Suture board with rope, silk suture thread, suture needle, fake skin, pig legs, hemostats, scissors, needle holders, forceps, checklists, Fundamentals of Laparoscopic Surgery (FLS) simulators with peg transfer board, precision-cutting gauze, laparoscopic instruments (graspers, scissors), timer, time score sheet, tourniquet, alcohol prep, various sizes of needles, catheters, and syringes, gloves, tape, gauze, Tegaderm®, saline, IV tubing, chloro prep, Band-Aids®, sterile gowns, sterile gloves, bouffant hats, shoe covers, surgical hand antiseptic, hand scrub nail picks, chlorhexidine, paper towels, hand sanitizer, hand scrub.

• Six undergraduate students received training within a five-week duration in the following skills: suturing and knot-tying, FLS (peg transfer and precision cutting), peripheral intravenous (IV) cannulation, gowns, gloving, and scrubbing, and performing intramuscular (IM) injections. After documented deliberate practice, which varied among the students, the participants were assessed in all skills, excluding gowns, gloving, and scrubbing, by at least one of the following: objective checklists, timing parameters, or a supervising rater. Students will return for an assessment in gowns, gloving, and scrubbing prior to clinical rotations in medical school.

• References


RESULTS

• Five of the six students successfully completed the suturing and knot-tying course.

• Four of six students achieved times under the limit designated as the competency standard for peg transfer and precision cutting.

• Five of the six students successfully completed the peripheral IV cannulation session.

• All six students successfully completed the IM injection course.

• All students were educated in gowns, gloving and scrubbing.

LIMITATIONS

• Variation in motor skills among students

• Number of scores logged by students

• Amount of experience with fine motor skills (some participants’ high FLS scores because of video games—accustomed to hand movements and the screen/reality discrepancy, another female participant’s ability to quickly pick up knots because she made friendship bracelets frequently when young—experience in knot tying)

CONCLUSIONS

Due to their lack of experience, medical students typically observe procedures instead of participating. Research literature has shown, many preceptors are uncomfortable letting them participate and potentially risk patient safety (Ladak, Hanson, de Gara, 2005). Because of this inexperience, novices perform worse than experts, especially when presented with complex scenarios (Kuw T. et al., 2012). By creating opportunities for more experiences earlier, medical students could be better equipped during their residency.

Computerized simulation can aid with the traditional “see one, do one, teach one” method by replacing patients with mannequins, thereby eliminating the concern of harming a patient (Norris, Cullison, Finn, 1997). Simulations also offer the opportunities to provide feedback as well as deliberate practice, which enhances learning (Lammers et al., 2008). Our six novices were able to attain competency in basic procedural skills when given the opportunity to receive simulation-based training and adequate time to practice. This practice however, must be continued and distributed over time for maximum skill retention (Castanelli, 2009), which supports the idea of monthly sessions for undergraduate students.

• Next steps

  o More undergraduate students, monthly meetings to teach procedural skills and offer time for deliberate practice

• Desired outcomes

  o Bring students to a high competency level so they can enter medical school with basic knowledge of procedural skills and practice these skills during rotations

• Future ideas

  o Expand early skill training

  o Follow European medical education model with medical school beginning after high school.

CLINICAL IMPLICATIONS

Increasing needed time during residency for mastery of skills.

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