

Can Simulated Team Tasks be Used to Improve Nontechnical Skills in the Operating Room?

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OBJECTIVE: The purpose of this study was to understand the effect of a team-based surgical skills intervention on the technical and nontechnical skills of surgery residents.

DESIGN: This was a prospective cohort study with pretesting or posttesting. We designed basic tasks for the assessment and learning of nontechnical skills in the operating room (OR). A total of 15 postgraduate year 1 residents performed an open gastrojejunostomy in a simulated OR setting (pretest), followed by training in the 3 team-based tasks designed to teach communication and teamwork, followed by performance of a gastrojejunostomy in the simulated OR (posttest).

SETTING: Tertiary care, university-based teaching institution.

PARTICIPANTS: A total of 15 general surgery residents at the intern level.

RESULTS: The mean nontechnical skills for surgeons (NOTSS) score improved postteam task training (10.04 ± 0.33 vs. 12.14 ± 1.33). There was a concomitant increase in the objective structured assessment of technical skills (OSATS) score (18.56 ± 0.86 vs. 22.86 ± 0.15 , $p = 0.006$). The percentage increases in OSATS and NOTSS score for each resident was similar ($19.49 \pm 4.8\%$ for NOTSS vs. $21.22 \pm 4.92\%$ for OSATS, $p = 0.502$).

CONCLUSION: Nontechnical skills positively correlate with the technical performance of a surgeon. Simple, easily designed tasks can be used to improve NOTSS in the OR. These team tasks and development of curricula based on

them can be used to explicitly address one of the most important components of ACGME core competencies for surgical residents, namely interpersonal skills and communication. (J Surg Ed 1:1111-1111. © 2016 Published by Elsevier Inc. on behalf of the Association of Program Directors in Surgery)

KEY WORDS: gastrojejunostomy, technical skills, nontechnical skills, education

COMPETENCY: Interpersonal and communication skills

INTRODUCTION

There is strong evidence to support the notion that nontechnical skills play a major role in the occurrence of adverse surgical events.¹⁻⁵ In addition to technical insufficiency, adverse events can occur because of errors in cognitive skills (such as teamwork), social skills (such as situational awareness), and personal resource skills (such as stress management). These 3 domains (cognitive skills, social skills, and personal resources skills) are together called nontechnical skills.^{1,6}

There is a burgeoning interest in the relationship between technical and nontechnical skills. A number of studies suggest a correlation between technical and nontechnical skills.^{1,6,7} However, it is unclear whether or not this correlation implies that an improvement in nontechnical skills would correlate with an improvement in technical skills, or vice versa.

In order to assess the effect of a non-technical skill intervention on technical skills, a study evaluated the effect of non-technical skills coaching on simulated operating room (OR) performance.⁸

In the present work, we designed tasks to improve the teamwork-related nontechnical skills of surgical interns through the introduction of technical team tasks, and

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assessed the effect of that training on the technical and nontechnical skills employed during a routine operative procedure. Our hypothesis was that both nontechnical and technical skills would improve after teamwork training.

MATERIALS AND METHODS

Study Design and Participants

A total of 15 residents at the postgraduate year 1 (PGY1) level (both preliminary and categorical) were used as subjects for the study. All 15 residents were introduced to a gastrojejunostomy (GJ) on the day of their pretest via a 20-minute Powerpoint presentation, followed by a 20-minute live demonstration of a GJ on a porcine model by an attending surgeon. Immediately following that demonstration, residents were asked to perform an open GJ using porcine stomach and intestine in a simulated OR setting. The performing of this GJ comprised the pretest. The pretest was followed by 3 training tasks designed to teach teamwork-related skills, which comprised the intervention. This intervention was followed by performance of an open GJ in the same simulated OR setting, which comprised the posttest.

The residents were trained in 3 groups (approximately 5 residents per group). Within each group, the pretest and intervention occurred on the same day. The posttest was conducted the following day. Groups were trained in consecutive months, so the entire study took 3 months to complete (2 days per month for 3 consecutive months). The residents were not told of the details of the study or assessment methods.

Evaluation

Both the pretest and posttest were video and audio recorded. Overall, 3 surgeons who were blinded to whether or not the resident was performing a pretest or posttest independently reviewed these videos. Validated assessment tools (nontechnical skills for surgeons [NOTSS] and objective structured assessment of technical skills [OSATS]) were used to assess the residents' technical and nontechnical skills, respectively, and are described in detail elsewhere.^{6,8} Additionally, a procedure-specific rating tool (Fig. 3) was developed to assess the technical performance of the GJ. This tool broke the GJ into 9 distinct steps, and the score for each step ranged from 1 to 3. Additionally, a time score (range: 1-3) was given based on the number of steps completed in the allotted time.

The residents were given feedback in-person on their technical and nontechnical performance, immediately following the posttest. Feedback was given by the same attending surgeon who performed the demonstration of a GJ prior the pretest. Additionally, residents were surveyed about their experience with this training module.

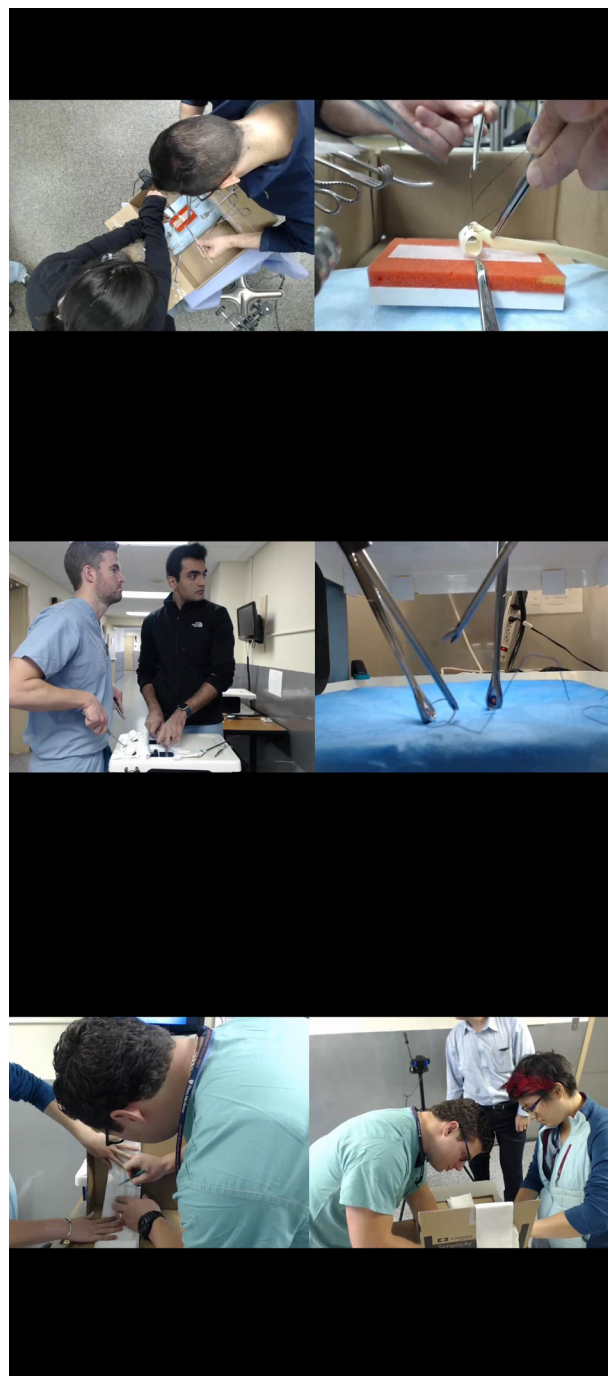


FIGURE 1. Team tasks set up.

Intervention: The Team Training Tasks

A total of 3 team tasks were designed. Each task required communication between the team members to be completed successfully. We used low cost, readily available materials for these tasks. The technical details of the tasks are provided in Figure 1, and the 3 tasks are described below.

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