

Assessment of the Educational Value of Mock Oral Competency Exams for Surgical Interns

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ABSTRACT

Introduction: Limited data exist regarding mock oral competency exams (MOCEs) and their impact on junior surgery residents, who are commonly assessed with written posttest exams. The COVID-19 pandemic also affected surgical education. Therefore, we evaluated interns' perceived impact of MOCEs, including satisfaction compared with written posttest exams and the potential impact of the COVID-19 pandemic.

Methods: From 2017 through 2022, surgery interns participated in MOCEs consisting of two clinical scenarios per intern. Participants completed surveys evaluating the perceived impact of MOCEs using 5-point ordinal scales and yes/no responses. A positive response was defined as good, slightly better, excellent, significantly better, or yes.

Results: Fifty-nine of 73 interns (80.8%) completed the survey; 54 (91.5%) reported that MOCEs provided an improved review of material compared with written posttest exams. This correlated with average positive ratings indicating MOCEs were a valued educational activity (98.3%), a personal challenge (89.8%), a dynamic quality teaching method (93.2%), beneficial through observation of colleagues' examinations (94.9%), and an improvement in knowledge and application of didactic material (84.7%) (Spearman $\rho = 0.44$, $P < .001$). The postpandemic cohort ($N = 23$) rated MOCEs as more valuable than the prepandemic cohort ($n = 36$) (mean 4.7 ± 0.4 vs mean 4.3 ± 0.5 , $P = .004$, Cohen $d = 0.80$).

Conclusions: MOCEs may serve as an effective tool for applying knowledge during the formative years of surgical training. Interns affected by COVID-19 reported higher perceived benefits, potentially reflecting increased importance of competency-based and in-person education. MOCEs warrant further study and may be valuable to incorporate early in residency training.

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INTRODUCTION

Standardized mock oral competency exams (MOCEs) have been established as a valuable educational tool for training general surgery residents. They have been used not only to identify areas for improvement in a program's curriculum and rotation schedule but also to recognize gaps in clinical knowledge.¹ Traditionally, senior surgery residents have also subjectively reported that MOCEs are beneficial to their education and preparation for certifying oral examinations.^{2,3} Importantly, multiple studies have shown that MOCEs taken by senior surgery residents improve certifying oral examination pass rates.^{2,4-7}

However, junior surgery residents and their performance gains are most commonly assessed by written posttest exams. Additionally, most residency programs rely on external assessment tools, such as the American Board of Surgery In-Training Exam (ABSITE), as a summative approach for gauging knowledge and creating formalized education plans for junior resi-

dents. Limited data describe the influence of MOCEs on junior surgery residents, particularly in comparison with written posttest exams. In 1 study surveying general surgery residency program directors, only a minority of programs offered MOCEs to postgraduate year 2 (PGY-2) and PGY-1 surgery residents—23% and 15%, respectively.⁸ The benefits noted for senior surgery residents may also apply to junior residents in both clinical and educational settings.

The COVID-19 pandemic affected surgical education methodologies and prompted widespread adoption of virtual platforms

at the end of medical school and the beginning of residency for many junior surgery residents. Literature on the efficacy of virtual surgical education has been mixed. While flexibility and improved work-life integration were reported as benefits,⁹ junior residents also described increased distractions and a decline in protected educational time.¹⁰ Now that surgical education has transitioned back to in-person formats, evaluating the perception and efficacy of in-person sessions among trainees who experienced substantial virtual learning is warranted—particularly regarding interactive-based sessions such as MOCEs.

Therefore, the aim of this study was to evaluate the perceived impact of MOCEs administered to surgery interns on overall satisfaction compared with written posttest exams. We also assessed the perceived value and quality of MOCEs as an educational tool and their impact on confidence in clinical performance. Furthermore, we performed a subanalysis to evaluate the impact of the COVID-19 pandemic on a prepandemic versus postpandemic cohort to identify any notable differences in the perceived impact of MOCEs.

METHODS

Study Population and Mock Oral Competency Exams

This single-institution study was conducted at a major academic program with an associated general surgery training program. General surgery interns participated in MOCEs as an in-person educational exercise during didactic curriculum from the 2017-2019 and 2020-2022 academic years. No MOCE sessions were conducted virtually. MOCEs were administered by surgical education faculty and consisted of 2 clinical scenarios per intern, presented in front of peers, that covered topics taught during didactic sessions. There were five MOCE sessions; therefore, each intern participated in 10 unique clinical scenarios throughout the academic year.

The MOCEs were conducted in a standardized fashion, with each scenario lasting 9 minutes. Time was allocated for individualized verbal feedback from faculty and peers. Feedback addressed the content of the clinical scenario as well as additional elements, such as communication style, mannerisms, and facial expressions.

At the end of the academic year, participating residents completed a 9-item questionnaire evaluating the perceived impact of MOCEs (Box). No identifying information was collected, and participation was optional. Surveys were administered at year end to capture the cumulative perceived impact of all of the MOCEs. Interns were selected to participate rather than all junior surgery residents (eg, first- and second-year residents) to assess the effect of MOCEs at the earliest stage of training in a focused manner and due to resource limitations. No surveys were administered during the 2019-2020 academic year because of the COVID-19 pandemic.

The survey consisted of 5-point ordinal scale and yes/no responses. A positive MOCE response was defined as a reply of

Box. Mock Oral Competency Exam Survey

1. Do you feel the mock oral competency exams improved review of materials better than a written posttest exam?^a
 - a. Significantly better
 - b. Slightly better
 - c. Neutral
 - d. Slightly worse
 - e. Significantly worse
- For Questions 2-6, please use the following ordinal scale: 1=poor, 2=unsatisfactory, 3=satisfactory, 4=good, 5=excellent
2. Please rate the value of the oral competency as an educational curriculum activity.
 3. Please rate the value of your personal challenge during this activity as the examinee.
 4. Please rate the dynamic quality of teaching while being orally examined during the mock oral competency exams.
 5. Please rate the educational benefit while observing your colleagues being examined.
 6. How do you rate the improvement of your knowledge and application of the didactic materials covered during each respective block component by undergoing the mock oral competency exams?
 7. Do you feel the mock oral competency exams improved your clinical performance involving routine patient care scenarios?
 - a. Yes
 - b. No
 8. Do you feel the mock oral competency exams improved your clinical performance involving complex patient care scenarios?
 - a. Yes
 - b. No
 9. Choose all the aspects of surgical care that were helped by undergoing the mock oral competency exams (circle all that apply).
 - a. Surgical indications
 - b. Postoperative care
 - c. Postoperative complications
 - d. Alternative surgical options
 - e. Preoperative workup

^aWritten posttest exams primarily included multiple-choice question exams.

good, excellent, slightly better, or significantly better for 5-point scale questions and yes for binary questions. To assess the effect of the COVID-19 pandemic on the perceived impact of MOCEs, survey responses for a prepandemic cohort (2017-2019) were compared to a postpandemic cohort (2020-2022). The Institutional Review Board approved this study as an exempt education project.

Statistical Analysis

Each survey question was analyzed independently. Additionally, responses to 5 questions within 1 grouped section (Questions 2-6, Box) assessed the specific impact of MOCEs as (1) a valued educational activity, (2) a personal challenge, (3) a dynamic quality teaching method, (4) beneficial through observation of colleagues' examinations, and (5) an improvement in knowledge and application of didactic material. Responses to these questions were averaged for selected analyses.

Spearman ρ correlations (r_s) were used to establish bivariate strength across measures. Independent t tests, Mann-Whitney U tests, and Cohen d effect sizes assessed the impact of COVID-

Table 1. Descriptive Statistics for the Mock Oral Competency Exam Survey

| Mock Oral Competency Exam Survey Questions | Survey Responses, N (%) | | | | |
|---|-----------------------------------|------------------------------|--------------|----------------|---------------------|
| | Significantly Better ^a | Slightly Better ^a | Neutral | Slightly Worse | Significantly Worse |
| 1. Do you feel the MOCE improved review of materials better than a written posttest exam? ^b | 45 (76.3) | 9 (15.3) | 4 (6.8) | 1 (1.7) | 0 (0.0) |
| | Excellent ^a | Good ^a | Satisfactory | Unsatisfactory | Poor |
| 2. Please rate the value of the oral competency as an educational curriculum activity. ^b | 44 (74.6) | 14 (23.7) | 1 (1.7) | 0 (0.0) | 0 (0.0) |
| 3. Please rate the value of your personal challenge during this activity as the examinee. ^b | 32 (54.2) | 21 (35.6) | 6 (10.2) | 0 (0.0) | 0 (0.0) |
| 4. Please rate the dynamic quality of teaching while being orally examined during the MOCEs. ^b | 36 (61.0) | 19 (32.2) | 3 (5.1) | 1 (1.7) | 0 (0/0) |
| 5. Please rate the educational benefit while observing your colleagues being examined. ^b | 36 (61.0) | 20 (33.9) | 3 (5.1) | 0 (0.0) | 0 (0.0) |
| 6. How do you rate the improvement of your knowledge and application of the didactic materials covered during each respective block component by undergoing the MOCEs? ^b | 24 (40.7) | 26 (44.1) | 6 (10.2) | 3 (5.1) | 0 (0.0) |
| | Yes ^a | | No | | |
| 7. Do you feel the MOCEs improved your clinical performance involving routine patient care scenarios? ^b | 55 (93.2) | | 4 (6.8) | | |
| 8. Do you feel the MOCEs improved your clinical performance involving complex patient care scenarios? (N=58) | 49 (84.5) | | 9 (15.5) | | |

Abbreviations: MOCEs, mock oral competency exams.

^aAnswers of “significantly better,” “slightly better,” “excellent,” “good,” or “yes” indicated a positive response.

^bN=59, except where specified.

19 on perceived MOCE benefit between prepandemic and postpandemic cohorts. Inter-item reliability of the 5 grouped questions was measured with Cronbach α .¹¹ Statistical significance was set at $P \leq .050$. Analyses were performed using IBM SPSS, version 24.0 (IBM Corporation).

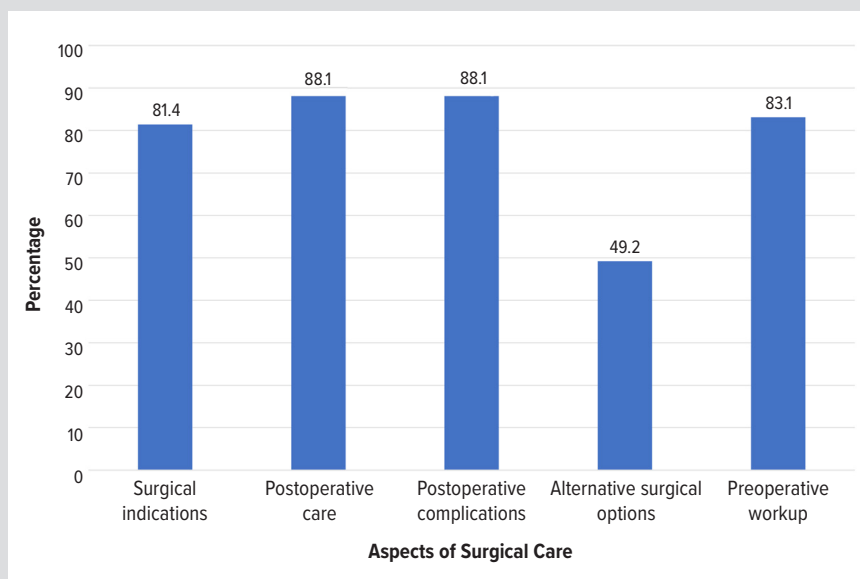
RESULTS

Mock Oral Competency Exams

Of 73 surgery interns, 59 (80.8%) completed the MOCE survey; 54 (91.5%) rated MOCEs positively in relation to improved review of didactic material (Table 1). More specifically, across 5 survey questions, interns indicated that MOCEs were positive as a valued educational activity (58/59, 98.3%), a personal challenge (53/59, 89.8%), a dynamic quality teaching method (55/59, 93.2%), beneficial due to observing the examination of colleagues (56/59, 94.9%), and an improvement in knowledge and application of didactic material (50/59, 84.7%). The average positive ratings for these 5 questions ($\alpha=0.78$) correlated with the positive rating that MOCEs provided an improved review of didactic material compared with written posttest exams ($\rho=0.44$, $P < .001$).

Regarding patient scenarios, responses were positive that MOCEs improved clinical performance for both routine (55/59, 93.2%) and complex (49/58, 84.5%) cases (Table 1). For specific aspects of surgical care, most respondents reported improved knowledge of surgical indications (81.4%), postoperative care

Figure. Surgery Interns Who Perceived Their Understanding Was Helped by Mock Oral Competency Exams (N=59)



(88.1%), postoperative complications (88.1%), and preoperative workup (83.1%) (Figure). However, only 49.2% of respondents indicated that their perceived knowledge of alternative surgical options improved through MOCE participation.

Evaluation of Prepandemic and Postpandemic Cohorts

To evaluate the impact of the COVID-19 pandemic, 36 interns (61.0%) were in the prepandemic cohort and 23 (39.0%) were in the postpandemic cohort. The postpandemic cohort perceived MOCEs as significantly more valuable than the prepandemic cohort (mean, 4.7; standard deviation [SD], 0.4 vs mean, 4.3;

Table 2. Mann-Whitney U Tests Comparing Perceived Impact of Mock Oral Competency Exams Between Prepandemic and Postpandemic Cohorts

| | Prepandemic ^a Mean Rank | Postpandemic ^a Mean Rank | Mann-Whitney U | P value |
|--|---------------------------------------|--|----------------|---------|
| 1. Do you feel the Mock Oral Competency Exams improved review of materials better than a written posttest exam? | 28.89 | 31.74 | 374.0 | .403 |
| 2. Please rate the value of the oral competency as an educational curriculum activity. | 26.82 | 34.98 | 299.5 | .019 |
| 3. Please rate the value of your personal challenge during this activity as the examinee. | 29.11 | 31.39 | 382.0 | .577 |
| 4. Please rate the dynamic quality of teaching while being orally examined during the MOCEs. | 27.24 | 34.33 | 314.5 | .072 |
| 5. Please rate the educational benefit while observing your colleagues being examined. | 25.76 | 36.63 | 261.5 | .006 |
| 6. How do you rate the improvement of your knowledge and application of the didactic materials covered during each respective block component by undergoing the MOCEs? | 25.51 | 37.02 | 252.5 | .006 |

Abbreviation: MOCEs. Mock Oral Competency Exams.

^aPrepandemic cohort N=36, postpandemic cohort N=23.

SD, 0.5, respectively; $P = .004$), with a Cohen d effect size of 0.80.

Mann-Whitney U tests showed significant differences between cohorts for several survey items (Table 2). Compared with the prepandemic cohort, interns in the postpandemic cohort reported that MOCEs were more of a valued educational activity (Mann-Whitney $U = 299.5$, $P = .019$), more beneficial due to observing colleagues' examinations (Mann-Whitney $U = 261.5$, $P = .006$), and more effective in improving knowledge and application of didactic material (Mann-Whitney $U = 252.5$, $P = .006$). There was no significant difference between cohorts regarding the perception that MOCEs provided a better review of didactic material than written posttest exams.

DISCUSSION

Our study demonstrated that surgery interns perceived MOCEs positively in relation to their educational and training experience in a variety of ways. They not only indicated that MOCEs provided an improved review of didactic material compared with written posttest exams, but they also rated them highly as a valuable, quality educational tool. Clinical performance involving overall patient scenarios, as well as understanding of specific aspects of surgical care, were also reported as improved through participation in MOCEs. Lastly, the perceived value of MOCEs as an educational tool was greater in the postpandemic cohort than in the prepandemic cohort.

Although MOCEs can result in multiple benefits to a resident's overall education, implementation and evaluation of their impact have largely focused on senior surgery residents in their third to fifth clinical years.^{6,7,12,13} Junior surgery residents, however, frequently undergo more traditional assessments, such as written posttest exams. Therefore, our finding that surgery interns perceived MOCEs as a more useful review of didactic information than written posttest exams is important and highlights the relevance of interactive, dynamic learning and application of knowledge. Prior education research has demonstrated that written posttest exams and summative assessments may impede critical thinking skills, while active learning approaches can enhance criti-

cal thinking, problem-solving abilities, communication skills, a sense of community with peers, and learning.^{14–18} These outcomes of active learning represent important characteristics for junior surgery residents to develop early in training.

Many studies have identified that senior surgery residents' participation in MOCEs correlates with higher certifying oral examination pass rates.^{2,4–7} However, additional clinical and educational benefits of MOCEs may positively influence resident development. Prior studies show that MOCEs are effective tools for assessing and improving medical knowledge, patient care, communication skills, confidence, and professionalism.^{12,13} For example, Lu et al reported that when faculty utilized Accreditation Council for Graduate Medical Education (ACGME) competency standards to rate a resident's medical knowledge, higher rates of medical knowledge correlated with a stronger MOCE performance.¹³ MOCEs also provide structured review of clinically relevant topics, encourage ongoing studying, and offer opportunities to strengthen clinical reasoning skills.^{4,6}

Delivery of feedback after MOCE administration is essential for maximizing their educational benefit. Through participation and individualized feedback, residents can learn how to increase confidence, address knowledge gaps, and improve communication and professionalism.^{4,6,12} This is notable because deficits in areas such as communication and professionalism may negatively affect oral certifying examination pass rates.^{19,20} Additionally, a multi-institutional study by Fingeret et al found that lower ABSITE percentiles were significantly associated with certifying oral examination failure.⁵ Thus, personalized approaches to education and feedback—such as those provided through MOCEs—may be valuable early in surgical training.

To our knowledge, the perceived influence of MOCEs among surgery interns has not been investigated previously. Incorporating MOCEs at the start of residency may have a positive impact on junior residents. Early use of this educational tool has the potential to identify deficits in medical knowledge, communication skills, professionalism, and confidence, allowing the development of individualized learning plans as early as possible. Additional ben-

efits to MOCEs also warrant further study. For example, objective and longitudinal assessment of early MOCE implementation and its associations with knowledge retention, clinical performance, ABSITE performance, ACGME milestone completion, and certifying oral examination pass rates may be worthwhile.

The COVID-19 pandemic inevitably altered the educational landscape, with components of curriculum transitioning to virtual platforms for didactic teaching. As noted, the literature has been mixed regarding the efficacy and utility of virtual learning. Wise et al reported that residents, including junior-level residents, favored web-based lectures over traditional lectures and found them easier to integrate into busy schedules.⁹ However, other studies focusing on junior residents found that virtual education increased distractions, reduced protected educational time, and resulted in residents feeling less comfortable with online lectures than senior residents.^{9,21} In a study of otolaryngology residents, Goodman et al found that 61% of residents and 54% of faculty disagreed or were undecided that virtual MOCE sessions should replace in-person sessions.²² However, much of the prior literature has focused on virtual didactic lectures rather than interactive formats such as MOCEs.

We found that postpandemic surgery interns participating in in-person MOCEs perceived them as more valuable, higher-quality educational tools compared with prepandemic interns. Overall, the COVID-19 pandemic highlighted the evolving nature of surgical education. Our findings may reflect the growing importance of competency-based education, which is more dynamic than traditional didactic formats and incorporates interactive, personalized teaching.^{23,24} These findings may also suggest that postpandemic interns place particular value on in-person sessions after experiencing substantial virtual learning. In-person education offers advantages such as personalized interaction, more nuanced communication, and relaying body language.²⁵ Assessing resident perspectives and the potential advantages of in-person educational sessions—especially now that current cohorts have experienced both virtual and in-person learning—is important for ensuring that education curricula are aligned with learners' needs and implemented in the most effective manner.

Limitations

There were several limitations to our study. Although the MOCE process was standardized, there may have been inherent variability in the sessions based on the specific faculty administering the scenarios and the subject matter, which could have affected the perceived impact of the experience. Additionally, because this was a self-completed survey, self-report bias may have influenced responses, and perceptions of the impact of MOCEs may not fully reflect their true educational effect. Interns also may have felt pressured to respond more favorably because the study and survey were designed by faculty, creating a potential power dynamic. However, surveys were completed anonymously without identify-

ing information, and participation was optional.

Approximately 20% of interns did not complete the survey, which could have skewed the data if their perceptions differed meaningfully from those who responded. Among respondents, recall bias may also have been present because the survey was administered at the end of the academic year, after all MOCE sessions had taken place. Furthermore, our study assessed perceptions of MOCE impact rather than objective, measurable outcomes. Therefore, definitive conclusions about MOCEs being better than written posttest exams cannot be drawn, particularly because this was not a comparative study between MOCEs and written posttest exams. Nonetheless, the high perceived beneficial impact of MOCEs relative to written posttest exams, along with reported improvements in confidence across aspects of clinical care, underscores the importance of future work aimed at objectively evaluating the long-term educational value of MOCEs for junior surgery residents.

CONCLUSIONS

Overall, MOCEs have the potential to serve as an effective tool for applying knowledge during the formative years of surgical training, including as early as the intern year. The high perceived benefit of MOCEs highlights the importance of dynamic, interactive teaching methodologies. Additionally, surgery interns affected by COVID-19 reported greater value in MOCEs, potentially reflecting increased importance of competency-based education and the benefits of in-person examination. Participation in MOCEs was perceived as beneficial to both clinical performance and educational development. Implementation of MOCEs early in residency should be considered, and future studies are warranted to evaluate the objective impact of this educational tool on junior surgery residents.

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