The Impact of an Advanced Certifying Examination Simulation Program on the American Board of Surgery Certifying Examination Passage Rates

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BACKGROUND: The national pass rate for the American Board of Surgery Certifying Examination has decreased in the past 5 years. An individual's ability to pass might be as dependent on his or her handling of the psychology of the examination—the "examanship"—because it is about clinical knowledge and judgment. To assess this, we implemented the Advanced Certifying Examination Simulation (ACES) program. The ACES was created as a novel method to simulate the stress of the Certifying Examination and focuses on the examanship of the test.

STUDY DESIGN: We compared the outcomes of the ACES program with its predecessor, a conventional mock oral program, as measured by residents' first-time pass rates on the Certifying Examination. First-time Certifying Examination pass rates of 26 residents who went through the ACES program were compared with 30 residents who completed the conventional mock oral program.

RESULTS: There was a significant increase in passage rates for residents taking part in the ACES program (100%) compared with residents taking part in the conventional mock oral program (83.3%). The groups were equivalent based on previously determined predictive factors of Certifying Examination success, such as in-training and licensing examination scores.

CONCLUSIONS: The ACES program provides feedback on the qualities of examanship: controlling anxiety, expressing a positive attitude, and maintaining a strong and confident voice. By providing a structured, simulated venue where residents can safely gain experience, we believe that ACES might lead to increased first-time passage rates on the American Board of Surgery Certifying Examination. (J Am Coll Surg 2014;219:280–284. © 2014 by the American College of Surgeons)
of the examination—the “examanship” —as it is about
clinical knowledge and judgment. Mastering the examan-
ship is about being cognizant of one’s performance and
behaviors during the examination. This includes commu-
nication factors, such as controlling anxiety, expressing a
positive attitude, maintaining eye contact, using appro-
priate language, limiting extraneous movements and
gestures, and maintaining a strong voice and confident
demeanor, as well as factors such as properly organizing
responses and managing questions with which examinees
are unfamiliar. For this reason, an important aspect of
preparation for the examination is improving participants’
skills in all the above areas, as it has been shown to affect
scoring.9-12 Additionally, communication deficiencies and
examination apprehension are common issues in those
who do not pass.12 Interestingly, residents rate the clarity
of their explanations in Certifying Examination practice
sessions much lower after they review a tape of their ses-
session compared with their immediate perception after
completing the session, which suggests there is room for
improvement in residents’ communication skills for the
Certifying Examination.13

Currently, a variety of methodologies are used to prepare
residents for the Certifying Examination. These include
conventional mock oral examinations, one-on-one practice
sessions with faculty, and expensive review courses. Mock
oral examinations have become an increasingly popular
preparation method. Historically, the literature demon-
strates some uncertainty as to whether mock oral examina-
tions are beneficial.14 However, in recent years several
studies have demonstrated a large benefit of mock oral
examinations on Certifying Examination pass rates.15-17
Additionally, mock oral examinations have been shown to
be a very cost-effective means of preparing residents.16
Numerous commercial review courses exist too, and
their success varies. One such course, which has 20 years
of data, reports Certifying Examination pass rates of
97%, which greatly exceeds the national average.18 How-
ever, these courses can vary in cost from hundreds of dollars
to in excess of $3,000, which can be prohibitive.

With the goal of better preparing our surgical residents
for their Certifying Examinations, we created the
Advanced Certifying Examination Simulation (ACES)
program. The ACES was created as a novel method to
simulate the stress of the Certifying Examination and
focuses on the examanship of the test. In this study, we
looked to compare the outcomes of the ACES program
in comparison with its predecessor, a conventional
mock oral program, as measured by residents’ first-time
pass rates on the Certifying Examination. Our hypothesis
was that the ACES program would lead to increased first-
time pass rates based on improved resident examanship,
which allowed residents to better manage the anxiety
that occurs during the actual Certifying Examination.

METHODS
Conventional mock oral structure
From 2003 to 2008, thirty 3rd, 4th, and 5th year residents
took part in an annual citywide mock oral examination. These
examinations took place in a closed room, which typically included 2 unfamiliar faculty members. The examination set-up mirrored that of the actual Certifying Examination, with a 30-minute session occurring in each room. Each resident would experience 3 rooms during the day, and both faculty members from each room would provide written feedback within 24 hours. Additionally, residents would receive a score of 4, 5, or 6, which corresponded to a grade of fail, intermediate, or pass.

Advanced Certifying Examination Simulation
program structure
From 2009 to 2012, twenty-six residents took part in a
new mock oral examination structure. In this setting,
(monthly public mock oral examinations were held in an
auditorium setting in front of the entire residency class,
in which 3rd, 4th, and 5th year residents were randomly
chosen to participate, and faculty and 1st and 2nd year
residents observed. The session’s question topics were
not prereleased. Each session incorporated 2 faculty,
who were familiar to the participants, each asking a single
question to 1 resident. Three residents participated dur-
ing each session. Questions were chosen to be of interme-
diate difficulty by faculty. The resident would have
approximately 7 minutes to answer each question. After
both questions were completed, residents then received
5 minutes of oral feedback from both examiners, as
well as questions to the examiners from members of the
audience. Feedback was focused on the examanship of
the answer and less on clinical knowledge or judgment.
During an academic year, a resident would typically
actively participate 4 times. In preparation for this new
focus of the mock oral examinations, all residents were
exposed to approximately 2 hours of introduction to
examanship qualities at the beginning of each academic
year. At the end of each year, residents were also asked
to complete evaluations of the program. In addition to
taking part in the new mock oral structure, these residents
also participated in the conventional mock oral examina-
tion program as described here.

Statistics
The proportion of students that passed the Certifying
Examination on their first attempt was compared between
the groups by a 2-tailed, 2-sample test for proportions, based on our hypothesis that the ACES program would improve first-time Certifying Examination pass rates. Descriptive statistics were reported for each group by mean values with standard deviations or median values, with ranges depending on the normality of the data. To compare baseline medical knowledge, mean scores on US Medical Licensing Examination Step 1 scores were compared between groups by a Student’s t-test. Participants’ chief-year American Board of Surgery In-Training Examination (ABSITE) scores were compared between groups via the Mann-Whitney U test, due to the nonparametric distribution of these scores. All statistical tests were evaluated based on an α of 0.05. All statistical analysis was performed in JMP Pro software (version 10).

RESULTS
There was a significant increase (p = 0.049) in passage rates for residents taking part in the ACES program (100%) compared with residents taking part in the conventional mock oral group (83.3%). Additionally, each year, the residents are given an end-of-year program evaluation where they are asked to rate the effectiveness of 35 different components of the surgical education curriculum on a 1 to 10 Likert scale. For the last 2 years, the ACES program has had mean scores of 9.1 and 9.2 on this 10-point scale, which indicates residents rate it as the second most effective component of the curriculum, only behind the surgical skills laboratory (scores of 9.4 both years).

To demonstrate equivalency between the participants in the conventional mock oral and the new mock oral groups, comparisons between the groups were made on variables that have previously been shown to be predictive of success on the Certifying Examination—US Medical Licensing Examination Step 1 scores and ABSITE scores from participants’ chief year. The mean Step 1 score for the conventional mock oral group (230.6 ± 16.8) was not significantly different (p = 0.61) from the mean Step 1 score for the ACES program group (232.9 ± 16.3). Similarly, the median chief-year ABSITE scores for the conventional mock oral group (58, range 4 to 99) did not significantly differ (p = 0.77) from the median chief-year ABSITE scores for the ACES program group (58, range 11 to 97).

DISCUSSION
Our results demonstrate that comparing the conventional mock oral group and the ACES program group, which demonstrated very similar test-taking abilities, the ACES program leads to increased first-time Certifying Examination pass rates. We believe that this increased success might be due to residents that participate in the ACES program having greater examanship skills, which allow them to better navigate the heightened emotions that can be part of the oral examination. Additionally, residents that have participated in the ACES program highly value the contribution it provides to their overall education, as well as their preparation for passing the Certifying Examination.

There are several educational and preparation benefits of the ACES program. First, the simulation aspect of this new program is unique, recognizing that the cognitive, behavioral, psychological, and attitude components of the Certifying Examination are key factors in the examinee’s success. In addition, all 4 of these components are aspects that stress can affect. In the education literature, the latter 3 components would be part of the affective component of Bloom’s educational taxonomy, which also consists of cognitive and psychomotor aspects. The stress that coincides with the Certifying Examination is substantial, and it undoubtedly impacts examinee performance. Before the introduction of the ACES program, there was not an effective simulator of stress for the trainee that paralleled the stress of the Certifying Examination. In addition, there was not an adequate opportunity to teach residents how their personal management of stress during the examination impacted their performance. The ACES program creates an environment that is highly stressful, as the active participant is in front of a large crowd of peers and faculty. Based on its repeated administration, in conjunction with a more traditional mock oral examination format, it assists in demystifying the examination, which in itself might reduce residents’ anxiety about the test.

Second, by focusing feedback from faculty on residents’ examanship abilities, the educational objectives of the session provide examinees with awareness about how their stress affects their cognitive and affective processes, which are the very factors that have been shown to impact scoring and that residents might not be able to improve simply with more self-study or clinical exposure. Third, by requiring attendance of all junior and senior surgery residents alike, trainees are able to learn from other residents’ performances and the feedback that faculty provide. This component of the public oral examination has been previously documented to be an additional advantage.

Two earlier studies also investigated the possible benefit of mock oral examinations with similar methodologies. Guzman and colleagues demonstrated a statistically significant improvement in Certifying Examination pass rates, from 56% to 91% after implementing a mock oral examination, during which PGY4 and PGY5 residents actively participated and all other residents observed
the session. One key difference from our own investigation was that residents were aware of topics that they were being examined on ahead of time, and this earlier knowledge of the topics can reduce the stress of the session. Additionally, their baseline-passing rate was significantly lower compared with the passing rate of the examinees in our institution.

Aboulian and colleagues used a very similar methodology to Guzman and colleagues. They also demonstrated an increase in pass rates from a very high baseline level (88%) to all participants, similar to our findings. There were some differences in methodology from our study. Participants in this program were chosen ahead of time and aware of question topics. In contrast, our setting might be more anxiety inducing due to the randomness in which residents were chosen to present and their being unaware of the topic ahead of time. Additionally, our residents were exposed to a greater overall number of mock examinations. The focuses of the examinations might also have differed, as we chose to focus more on the examanship qualities of residents’ answers compared with clinical content.

One limitation of our study is that it is a retrospective analysis, which makes it difficult to assess exactly what aspect of the ACES program accounts for the improved performance. Although we hypothesize that it is due to greater examanship skills among the residents, it is also possible that their improvement can be explained simply by greater practice, as the new program could theoretically expose residents to the examination structure more than 60 times. However, we believe that inherent to this greater exposure and practice is an improvement in examanship skills. Additionally, both groups participated in the citywide examination. This method does have several benefits, including simulating the physical environment of the examination, exposing residents to citywide examiners with whom they were unfamiliar, and providing residents with written feedback on their performance. The benefit of having unbiased examiners has been shown previously. However, because approximately 17% of residents who participated only in this citywide program still failed their Certifying Examination, this preparation method might not be enough or might not have the correct focus to lead to resident success. With ACES, the goal was to provide a better simulation of the anxiety that is induced during the actual Certifying Examination, as well as place a larger educational emphasis on examanship.

To continue building on this work and to strengthen future research in this topic, we will seek to measure how the ACES program affects residents’ anxiety levels about participating in an oral examination. Ideally, we also hope to partner with other institutions in expanding the ACES program to validate our findings and assess its replicability.

CONCLUSIONS

The ACES program focuses its feedback on the qualities of examanship: controlling anxiety, expressing a positive attitude, and maintaining a strong and confident voice. Since introducing the ACES program, we have demonstrated an increase in our Certifying Examination passage rates to 100%. By providing a structured, simulated venue where residents can safely gain experience, we believe that ACES can lead to increased first-time passage rates on the American Board of Surgery Certifying Examination.

Author Contributions

Study conception and design: London, Awad
Acquisition of data: London, Awad
Analysis and interpretation of data: London, Awad
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REFERENCES