Basics of the Objective Structured Clinical Exam

Simulation in nurse anesthesia education is a diverse and dynamic training mode that offers educators opportunities to promote skill acquisition and critical thinking. One approach to utilizing simulation is the objective structured clinical exam (OSCE). The OSCE can be used as both a teaching tool and a testing tool. Developing an OSCE requires a needs assessment, specific goals, standardized objectives, a method of evaluation, and constructive feedback. Nurse anesthesia programs have options based on their individual needs and resources and are not restricted by fidelity. Incorporating standardization and structure into the administration and evaluation of OSCEs is vital to the success of both the simulation and the student.

Keywords: CSEI, high-fidelity simulation, objective structured clinical exam, OSCE, simulation.

Simulation is an educational platform offering both professional and trainee nurse anesthesia providers an opportunity to use knowledge, develop skills, and learn behaviors in a safe environment. Given the vast number of training aides and resources, faculty can use various simulation opportunities to enhance didactic knowledge and technical competence in student registered nurse anesthetists (SRNAs).

However, this dynamic learning mode presents multiple challenges to educators, the first of which is how to utilize simulation and of what type within the curriculum. The literature on both simulation and education offers facts and opinions about many aspects of implementing simulation. A common thread throughout is the use of an objective structured clinical exam (OSCE).

The Council on Accreditation of Nurse Anesthesia Educational Programs (COA) requires the use of simulation within the curriculum standards (Standard E.11) for training doctoral nurse anesthesia students. The COA defines these experiences as “including but not limited to standardized patients, web-based simulation, computer-based simulation, manikin-based technologies ranging from low- to high-fidelity, task trainers, and holodecks.” The OSCE is one method educators can incorporate to demonstrate compliance with this COA standard because it can be used for both skill reinforcement and evaluation of SRNAs in multiple areas throughout the curriculum. The purpose of this article is to define the OSCE and offer an organized approach to developing and using these exams for nurse anesthesia educators.

Definition of an Objective Structured Clinical Exam

Used within medical education since the 1970s, the OSCE was designed to assess provider performance within the clinical arena. The literature offers a variety of definitions and applications of the OSCE from single-station/single-skill assessment to multi-station/multi-skill assessment. Other differences found in the literature include variances in test stations, lasting from 5 to 20 minutes, can incorporate high-fidelity simulation, task trainers, standardized patient actors, computerized simulation, and short written exams. Since its inception, the OSCE has evolved within health care education to provide opportunities to assess problem solving, critical thinking, clinical skill level, and communication. The adaptability of the OSCE makes it a useful tool for nurse anesthesia simulation training because it can be used however individual programs feel is best for meeting the needs of their current students.

Development and Utilization of Objective Structured Clinical Exams

Given the vast differences in program locations, structure (integrated versus frontloaded), faculty numbers, class sizes, and budgets, no one design is feasible for all SRNAs. Therefore, the faculty and staff must first perform a program-specific needs assessment before invest-
ing time and resources into any OSCE. Given that OSCEs incorporate more than just technical skill evaluation, educators should seek input from both didactic and clinical faculty to identify any gaps in the curriculum or recurrent subpar performance in the perioperative area. Simulation directors should also consider consulting current students and recent graduates to determine which experiences they deem helpful for clinical success. The National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) National Certification Examination scores also offer program directors information about potential gaps in the curriculum that would benefit from simulation time and OSCE evaluation. For example, if program graduates are scoring low in the area of equipment, instrumentation, and technology, an OSCE could be designed specifically around the utilization of the anesthesia machine and special monitors. The needs assessment will also provide faculty the opportunity to collaborate and determine whether the OSCE will be used in a formative manner or a summative manner and whether SRNA progression will be determined by OSCE completion.

It is important to note that summative OSCE administration is much more labor- and resource-intensive than formative utilization. Formative evaluations promote learning and identify participants' strengths and weaknesses in an effort to improve future performance. Formative OSCEs do not have the same high-stakes association as the structure of a summative evaluation that compares participant performance to a standard resulting in a pass-fail grade. The testing atmosphere and potentially the performance of SRNAs is significantly impacted if progression through phases of the program is dependent on passing the OSCE. If OSCEs are to be used to determine a student’s ability to advance within the curriculum, policies on retesting and remedial training must be in place if an SRNA fails to successfully complete the OSCE.

Formative assessment is easily done in small groups with one instructor, whereas summative assessment requires multiple proctors, requires strict standardization, and can be costly if patient actors are incorporated into the scenarios. Depending on the level of fidelity associated with the OSCE, the intended objectives, the number of students, and the number of stations, summative assessment can also be exceedingly time-consuming. It is important to balance the program’s resources and objectives so as not to impede faculty or student performance in other mandatory aspects of the curriculum.

Once the foundational needs assessment is complete, development of the OSCE can begin. If, for example, an identified need is instruction in basic airway management, the next step is to define which concepts are essential to successful performance. These could include knowledge of airway anatomy, airway assessment methods, determining what equipment to use, utilization of equipment, and common pitfalls. Based on the identified essential concepts, the goals and objectives of the OSCE can be finalized.

The Society for Simulation in Healthcare recommends that each scenario have between 3 and 5 objectives. Hastie et al promote utilizing Bloom’s taxonomy when writing objectives to specify learner expectations regarding required psychomotor skills, cognitive skills, and behaviors. The goals and objectives provide basic structure to the OSCE and further drive its design. The objectives are matched to specific tasks. The simulated tasks, regardless of their level of realism, allow the participant to progress from the “knows” level of competence to the “shows” level on Miller’s prism of clinical competence (Figure). Per Miller, the highest level of competence, “does,” can only be assessed in the actual clinical environment, whereas an OSCE can assess the second highest level of competence.

Task identification also requires a logistics assessment, which may include identifying available equipment, assessing time (for both preparation and implementation), assessing costs, determining testing space, identifying personnel and training personnel, and choosing the evaluation method to be used.

Securing patient actors can be a costly and time-consuming part of designing an OSCE depending on fees and training. If available, experienced Certified Registered Nurse Anesthetists can be used as patient actors or OSCE test station evaluators and can earn Class B credits for the NBCRNA Continued Professional Certification Program. Health care simulation centers can be contracted to provide the equipment, space, and possibly the standardized patients. This can be costly for programs with a large number of students and will require travel. Travel to and from a testing site can add an additional expense to large-scale OSCE testing.

The realistic atmosphere of the OSCE is another important area of consideration. Ideally, simulation training should be conducted with the highest degree of realism, often called fidelity. Fidelity aims to mimic a real-life clinical situation with a combination of physical cues and functional true-to-life equipment. The success of the OSCE is not directly tied to the level of fidelity, nor do the exams require the use of computerized mannequins (high-fidelity simulation). No evidence suggests that the quality of simulation improves with increased realism. Regardless of the level of fidelity, successful scenarios largely depend on the participant’s ability to engage and accept the limita-
tions of the simulation. Therefore, providing the SRNAs a good orientation to the OSCE format and what is expected of them can promote a realistic learning environment in the absence of high fidelity.

Although high-fidelity simulators increase realism, they are expensive to purchase and maintain. They require trained operators, routine and unscheduled maintenance, and replacement of disposable items and are not without limitations. For example, the Laerdal SimMan 3G high-fidelity simulator currently costs between $100,000 and $125,000, whereas the Laerdal Adult Airway Management Trainer, a low-fidelity simulator, is about $2,200 (M. Dupree, written communication, October 2017). For trauma skill training, Simulab Corp offers the TraumaMan system for both rental and purchase. While technically a low-fidelity simulator by definition, this 6-skill task trainer offers realistic tissue layering and bleeding tissues for cricothyroidotomy, percutaneous tracheostomy, thoracic needle decompression, chest tube insertion, pericardiocentesis, and diagnostic peritoneal lavage. It can be purchased for $11,000 to $25,000 depending on the quantity of disposables and the degree of maintenance required (S. Hertz, oral communication, October 2017). The TraumaMan simulator system is regularly rented for Advanced Trauma Life Support classes and costs between $1,500 and $2,500 for a class of 16 students (S. Hertz, oral communication, October 2017). This includes 2 trainers and the necessary disposable replacements (S. Hertz, oral communication, October 2017). All 3 simulators can be used with success for a variety of airway management OSCEs.

When students train in simulation and are then tested in the same environment, the question arises as to whether the students met the scenario objectives or simply learned how to negotiate the simulator. Currently, no tool is available to determine whether participant performance within the simulator transfers to the clinical arena. OSCEs are routinely evaluated by use of comprehensive checklists or global rating scales (GRSs). Checklists are an objective step-by-step assessment of the required skill. The GRS is a comprehensive evaluation of skill performance. For example, the University of Florida Anesthesiology Residency Program designed a checklist to evaluate an OSCE by using a list of both critical and noncritical criteria. To pass the scenario, residents had to perform all the critical criteria. In comparison, the Creighton Simulation Evaluation Instrument (CSEI), a GRS developed by the Creighton College of Nursing, is a tool with established reliability that measures 22 nursing behaviors within 4 categories: assessment, communication, critical thinking, and technical skills. Both the CSEI and training for evaluators are available free online. Whichever method of evaluation is chosen, raters must receive training on the tool to maximize both intrarater and interrater reliability. Overall, the GRS provides a more holistic assessment of skills and typically has better validity and reliability than a checklist.

A critique of the SRNA’s performance is essential to solidify learning either during or immediately after any simulation.
exercise. Providing feedback to SRNAs is a complex skill, and simulation directors and faculty are encouraged to seek formal education and training on how to effectively deliver constructive comments to maximize the lessons learned. Feedback can be delivered to individuals or to groups with unidirectional communication or through bidirectional debriefing. Unidirectional feedback is the evaluator’s comments about the learner’s performance and behavior, whereas bidirectional debriefing is a reflective discussion between the evaluator and all learners within the scenario. The feedback technique is determined by whether the OSCE is a summative or a formative evaluation. Video recordings, if available, can lend both credibility and authenticity to evaluator comments while simultaneously highlighting certain aspects of the skill to the participant. Regardless of method used, it is important to incorporate 20 to 30 minutes into the schedule to allow for adequate feedback and debriefing.

Once the OSCE is finalized, faculty and staff should conduct a pilot run of the planned events. This will highlight the need for adjustments to the schedule, tasks, equipment, or staff. For large-scale OSCEs, additional assets (raters, equipment, and standardized patients) should be on standby during implementation in the event that unforeseen circumstances arise, such as a mannequin malfunction on the day of testing. After completion, a post-OSCE evaluation should be conducted to assess any potential opportunities to improve proficiency in implementation. Whether it is via a group debriefing of the process with students or staff or an anonymous survey, information should be gathered to determine the effectiveness of the training activity and to collect recommendations for future OSCEs.

Conclusion
In summary, OSCEs provide a flexible simulation method for evaluating the cognitive, psychomotor, and behavioral performance of health professionals. OSCEs can be used for both formative and summative evaluation and therefore provide competency attainment and assessment in alignment with COA Standard E.11. Nurse anesthesia training programs can adapt OSCEs to meet educational needs with available resources and are not restricted by realism or high fidelity. Although labor-intensive and potentially costly, OSCEs can be a vital tool. The most important detail when developing an OSCE is to incorporate standardization and structure within the design. This ensures that all students receive similar experiences throughout the simulation training. Regardless of the method used, consistency in administering and assessing the OSCE is of utmost importance to ensure the overall success of both the evaluation and the participant.

REFERENCES

AUTHOR
Michele M. Ballister, DNP, CRNA, APRN, CHSE, is an assistant professor and director of simulation at the Medical University of South Carolina in the Division of Anesthesia for Nurses in Charleston, South Carolina. Email: balliste@musc.edu.

DISCLOSURES
The author has declared no financial relationships with any commercial entity related to the content of this article. The author did not discuss off-label use within the article.