Teaching Tip: Practical Tips for Setting up and Running OSCEs

Authors:

Emily J Hall VetMB, SFHEA, MRCVS is a Lecturer in Veterinary Education, LIVE Centre, Department of Clinical Sciences and Services, Royal Veterinary College, Hawkshead Lane, North Mymms, Hatfield, AL9 7TA UK. Email: emilyhall@rvc.ac.uk. Her interests include clinical skills, assessment and interprofessional education. ORCID: 0000-0002-9978-8736

Sarah Baillie PhD, PFHEA, MRCVS is Professor (Emeritus) of Veterinary Education, Bristol Veterinary School, University of Bristol, Langford House, Langford, Bristol BS40 5DU, UK. Her interests include curriculum development, educational quality assurance, clinical skills, and assessment. ORCID: 0000-0002-8665-8369

Julie A. Hunt, DVM, MS is Associate Dean of Clinical Sciences and Associate Professor of Veterinary Medicine, Lincoln Memorial University College of Veterinary Medicine, Harrogate, TN. Her research interests include veterinary clinical skills model development, validation, and assessment. ORCID: 0000-0003-1927-432X

Alison J. Catterall AFHEA, is a Specialist Technician in the Clinical Skills Lab, Bristol Veterinary School, Langford, Bristol, BS40 5DU, UK. Her interests include teaching, assessing and model making for clinical skill development.

Lissann Wolfe RVN, MEd, BA, FHEA, is Clinical Skills Director and Senior Lecturer at University of Glasgow Veterinary School, 464 Bearsden Rd, Glasgow, G61 1QH, UK. Her interests include clinical skills teaching and assessment and curriculum development. ORCID: 0000-0002-4407-2079

Annelies Decloedt, DVM, PhD, is Associate Professor in Clinical and Communication Skills, Skillslab, Department of Large Animal Internal Medicine, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium. Her interests include equine cardiology, clinical skills teaching, veterinary education and veterinarian-client communication. ORCID: 0000-0001-8129-2006

Abi J Taylor VetMB, MRCVS, is Assistant Clinical Professor in Clinical and Surgical Skills, Department of Clinical Sciences, North Carolina State University College of Veterinary medicine, 1060 William Moore Drive, Raleigh, NC 27607, USA. Her research interests include clinical skills procedural simulation and model development.

Sandra Wissing DVM, is the Head of the Clinical Skills Lab of the University of Veterinary Medicine in Hannover, Bischofsholer Damm 15, 30173 Hannover, Germany. Her interests include clinical and communication skills.

ABSTRACT

Objective structured clinical examinations (OSCEs) are used to assess students' skills on a variety of tasks using live animals, models, cadaver tissue, and simulated clients. OSCEs can be used to provide formative feedback or can be summative, impacting progression decisions. OSCEs can also drive student motivation to engage with clinical skill development and mastery in preparation for clinical placements and rotations. This teaching tip discusses top tips for running an OSCE for veterinary and veterinary nursing/technician students, as written by an international group of authors experienced with running OSCEs at a diverse set of institutions. These tips include tasks to perform prior to the OSCE, on the day of the examination, and after the examination and provides a comprehensive review of the requirements that OSCEs place on faculty, staff, students, facilities, and animals. These tips are meant to assist those who are already running OSCEs and wish to re-assess their existing OSCE processes or intend to increase the number of OSCEs used across the curriculum, and for those who are planning to start using OSCEs at their institution. Incorporating OSCEs into a curriculum involves a significant commitment of resources, and this teaching tip aims to assist those responsible for delivering these assessments with improving their implementation and delivery.

Key words: Objective Structured Clinical Examinations, OSCE, clinical skills assessment, OSCE delivery, OSCE preparation, assessment, clinical skills

INTRODUCTION

Objective structured clinical examinations (OSCEs) were introduced to assess clinical competence in medical education in the 1970s and to address weaknesses in the previous assessment systems.[1] The OSCE is a multi-station, multi-rater examination requiring students to complete a time-limited task at each station. OSCEs evaluate students at the "Shows How" level of Miller's pyramid (Figure 1[2]) by assessing their ability to perform a clinical skill on a model, cadaver, or live animal prior to learning and being assessed in a workplace setting. Well designed and well delivered OSCEs can assess a range of clinical skills including practical animal handling, clinical and communication skills, making OSCEs an important assessment method for competency-based veterinary curricula. OSCEs can be used for both formative and summative assessment, sometimes serving as a progression hurdle or gateway assessment prior to clinical rotations, work-placement, or licensing.[3–5]

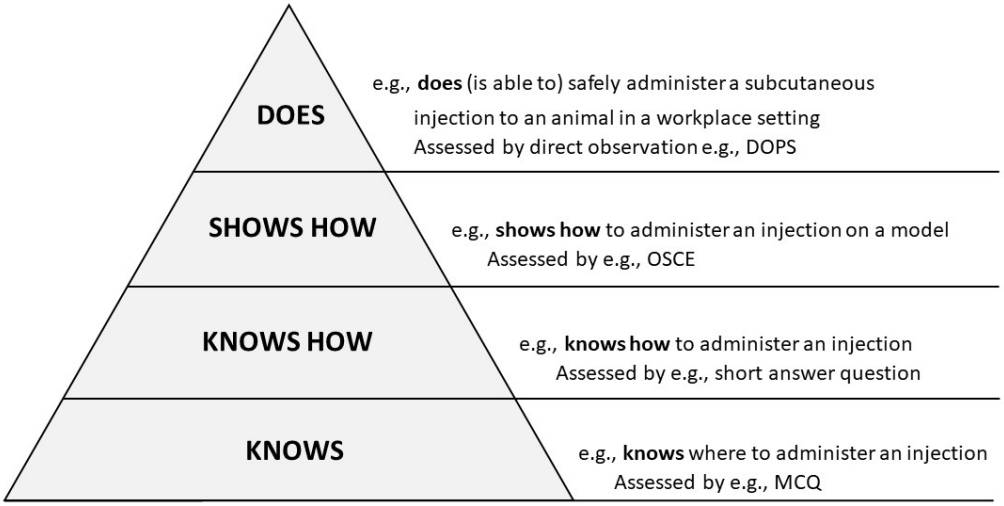

Figure 1. Miller's pyramid – a framework for clinical assessment.[2]

The purpose of an OSCE is to provide objective and structured assessment of a student's ability to perform a range of clinical skills.[1] OSCEs should be differentiated from assessments that aim to test knowledge (facts the student "Knows"), or the underpinning awareness of how to perform a clinical skill (the student "Knows How"), as OSCEs require considerable investment in terms of time, staff, resources, and budgeting.[6] Therefore, OSCEs should be reserved for assessing behaviors at the "Shows How" level near the top of Miller's clinical

assessment framework.[2] The Utility model proposed by van der Vleuten,[7] identifies key considerations when selecting any assessment method and can be useful when setting up and running OSCEs:

Utility = Reliability x Validity x Educational Impact x Acceptability x Feasibility (cost)

Whilst the reliability, validity, educational impact and acceptability of OSCEs have been well documented,[8–11] the feasibility must be carefully considered in terms of both financial[12,13] and resource costs, including staff and space availability.[14] The reliability and validity of an OSCE is influenced by the assessment design and delivery,[8,15] so detailed planning and meticulous organization is essential, requiring investment from both the course team and institution.

Compared to many other types of examinations, OSCEs require considerably more planning, staffing, and budgeting provisions to support robust assessment delivery. Additionally, the level of preparation required is similar whether assessing a large cohort of hundreds of students, a small cohort or providing a re-sit opportunity for a single student. Effective planning and delivery of the OSCE assessment is critical yet is less frequently mentioned in the literature. Several papers have described tips for organizing and running OSCEs in human medical education[14,16–18]; however, veterinary OSCEs differ from those in human medical education in their inclusion of animals, animal handlers, and simulated clients (animal owners) instead of simulated patients. Additionally, the resources and support available to run a veterinary school OSCE are typically more limited than those at a medical school.

This teaching tip combines expertise from educators with years of experience running OSCEs in veterinary medical and nursing (veterinary technician) education, to provide an overview of the key considerations to support logistical decision making, along with some tips learned through previous experience. This article does not address the rationale for using OSCEs or how to set a defensible passing standard, nor does it propose a single approach for OSCEs; instead the focus is on the practicalities of OSCE delivery and provision of tips for anyone already running OSCEs and wanting to review their OSCE delivery processes or expand the use of OSCEs in the curriculum, and for those new to OSCEs (Figure 2).

1. Getting started
2. Preparation is key

   Preparing the:

   3. Overall OSCE circuit
   4. Stations
   5. Examiners
   6. Delivery team
   7. Students
   8. Animals
9. On the day
10. Post assessment

Figure 2. Ten tips for preparing and delivering veterinary OSCEs.

TIPS FOR RUNNING SUCCESSFUL OSCEs

1. Getting started

When first introducing OSCEs, it is advisable to start small to ensure the implementation will be feasible. If the plan is overly ambitious the OSCE may not run successfully e.g., due to limited resources, lack of experience. Therefore, consider starting with a few simple but important tasks to evaluate as a formative OSCE. Such an approach will build examiner, staff, and student familiarity with the OSCE process, and identify logistical issues before any high-stakes summative OSCEs are deployed. One of the benefits of OSCEs is the educational impact of student engagement with learning skills and the associated practice that supports and enhances the development of competence.[19] When initially embedding OSCEs into a curriculum, consider where impact will be greatest and improve students' readiness for the next stage of training, such as work placements or clinical rotations. If possible, visit other veterinary colleges that already run OSCEs to observe a circuit in progress and the examination, scoring method, and administrative processes.

2. Preparation is key

Planning for an OSCE should ideally begin before the academic year of OSCE delivery. As these assessments have substantial staff, resource, and teaching space requirements, they must be carefully scheduled alongside other student and faculty commitments to ensure

availability of examiners and support staff. In addition to scheduling the main summative OSCE, organizers should plan for any practice or formative assessment opportunities, provision of OSCE feedback, revision and remedial training, and assessment for students requiring a remediation or deferral opportunity. Preparing well in advance of the OSCE cannot be over-emphasized, and it is key to place OSCEs in all relevant people's timetables as early as possible. Setting up and running a successful OSCE involves a committed and well-trained team, clearly defined protocols, and adherence by all to the examination processes.

A standard operating procedure (SOP) can be a useful planning tool, listing all the steps that need to be undertaken to ensure the OSCE will be delivered effectively and efficiently. SOPs typically consist of a table with a list of tasks, who is responsible, by when, and a 'sign-off' on completion. The list is usually chronological, starting at (or before) the beginning of the academic year, and includes the immediate run-up to the OSCE, the examination period, and the tasks occurring afterwards, such as recording 'lessons learned' to inform the next iteration.

The decision to run OSCEs within a curriculum also requires significant commitment of time and resources to support appropriate student learning opportunities. Scheduled clinical skills teaching within the curriculum is not enough; students must also be given access to the clinical skills facilities for independent practice. Psychomotor skills require repeated and deliberate practice,[20] and without plenty of opportunity and time some students will be predestined to fail. Some skills can be practiced at home if students have access to suitable resources (e.g., suturing, knot tying, bandaging), and many institutions are embracing flipped learning for clinical skills courses, to optimize the time students spend performing skills whilst in the laboratory.[21]

3. Preparing the overall OSCE circuit

An OSCE typically consists of a circuit of multiple stations (Figure 3) of the same duration (e.g., 5-15 minutes each). The overall circuit must be blueprinted, ensuring constructive alignment between the specific learning outcomes and competencies to be assessed and the skills taught at that stage of the curriculum.[22] Consideration should be given to the number of stations included versus feasibility.[7] Increasing the number of stations in the circuit makes the test more reliable.[23] However, initially it may not be possible to run a large

circuit (e.g., 12-20 stations) due to the availability of examiners, technicians, and administrators, and their current level of expertise. In those cases, starting with a smaller number of stations is more likely to make the OSCE achievable and successful.

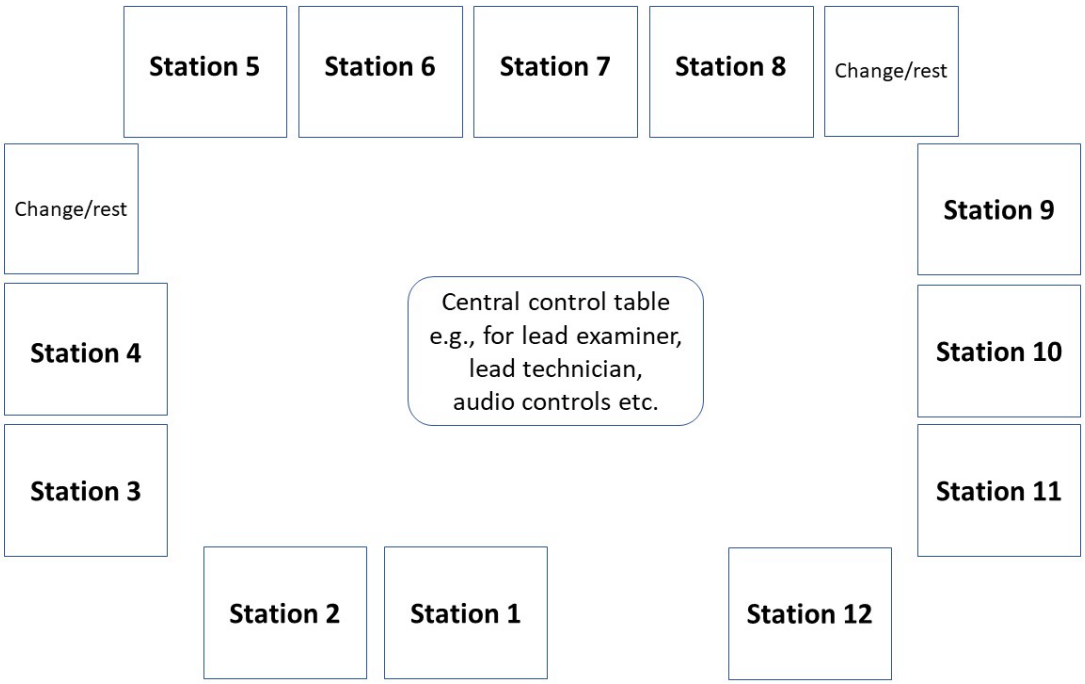

Figure 3. An example OSCE circuit with 12 assessment stations and two change/rest points

An OSCE venue is a key resource to identify early in the planning process. There must be sufficient space to set up all the stations with additional space for examiner briefing, debriefing and breaks, and a holding room for each group of students as they arrive. If students need to move between buildings during the OSCE, additional staff will be required to act as marshals, and student movement will need to be factored into the overall circuit timing. Station specific logistics require additional consideration when designing the OSCE circuit. Is a dark room required, as for ophthalmology or radiographic positioning? Does the station require animals, which will require housing and handling facilities? Do specific stations require power or access to water and a sink?

The OSCE circuit can either be delivered with all students starting at station one and finishing at the final station, or, it can be delivered as a loop, with each student starting at a different station and working round in order. The first option ensures each student faces the same assessment in terms of station order, but will take additional time to deliver.[24] If linked tasks are included within the assessment, the order of stations must reflect this. For

example, if students gown and glove and then move to a station to perform draping a patient, then these two stations must be adjacent. Rest stations may be needed to allow students to change clothing, walk between buildings, or re-focus after completing several stations. The flow between stations should be one way, with clear signposts and without the potential for students crossing over, which could lead to confusion. If there are multiple stations in one room, screens should be used to create clear boundaries between each station, reduce distractions and prevent observation of peers in other stations. If students are not told the content of the OSCE beforehand, then assessment security should be protected by obscuring windows and placing 'no entry' signs on doors as soon as circuit set-up begins.

When delivering OSCEs for large cohorts there are two options: set up multiple OSCE circuits or schedule the assessment over several days. Multiple circuits will increase the space, equipment and staffing requirements but increase efficiency. When scheduling the OSCE over several days, there may be concern from faculty and students regarding assessment integrity should the assessment be shared with students sitting the OSCE after day one. Consider if students will be told the content of the OSCE prior to arrival. As OSCEs assess a student's ability to "Show How" to perform a skill requiring practice and experience, the advantage a student would gain from prior knowledge of the assessment content should be minimal.[8] Sharing the OSCE content with all students a few days prior to the assessment can overcome the perceived disadvantage to those students scheduled to go first and can also help to dispel the myth that we are trying to trick students or catch them out, which may in turn improve student confidence in the process. Conversely, not revealing the content of specific stations forces students to study and practice a wider variety of tasks than those that appear on the OSCE, which may have a positive learning effect.

4. Preparing the stations

Designing new OSCE stations requires time, planning and expertise. First, skills which are appropriate for OSCE assessment must be identified. Then each station can be created, including a scenario, an equipment list, a risk assessment, a grading tool such as a checklist and/or rating scale, examiner information pack in paper or electronic format, and a plan of how the station will be set up, which will be replaced by photographs once the station has been tested (Figures 4 and 5). All new stations should be pilot tested by members of the

course team to ensure all equipment is present and easily accessible and to allow the task completion to be timed; typically, a member of the team should be able to do the task in about half the allocated time. Ideally, new stations should be used under formative conditions to ensure they perform as expected before being included in a summative, high stakes OSCE. Assessment organizers may underestimate the quantity of resources required if each student is allowed multiple attempts at a task, such as intravenous cannula placement, and therefore sufficient spares must be included on the equipment list.

Figure 4. A canine intravenous catheterization OSCE station photograph showing the station plan for standardized set up.

Figure 5. An equine intravenous catheterization OSCE station photograph, with a close up on the equipment on the right illustrating the station plan for standardized set up.

Where models are used for skills simulation, spare models should also be set up and readily available in the event of a malfunction. A fundamental principle of OSCE design is that each student has the same experience to reduce variation and support objective assessment.[1] One factor that can affect perceived fairness is when equipment or a model malfunctions, so having sufficient spares and consumables available at every station is important. Examiners should be prepared for this eventuality through instructions included as part of their station information pack on how to respond to a model or equipment malfunction, action to take regarding the student's time allowance (e.g., making a note of the time or pausing the timer on the station or the whole circuit) and how to respond to student queries regarding the functionality of any models.

The OSCE should be designed and delivered with consideration of accessibility for both examiners and students. Chairs should be provided for examiners and students to use wherever this is appropriate, the height of work-surfaces should be reviewed, and adjustable tables used if available. For stations such as gloving and gowning, consideration must be given to clothing sizes and potential allergens to ensure all students have access to the required equipment. If stations require students to evaluate colors, such as reading a urinalysis strip, students with color blindness may require reasonable adjustments. The principles of universal design can be applied to remove unnecessary obstacles to achievement, such as inadequate time allowed for reading the station scenario for students with learning differences or using their second language.[25] Practically, ensuring the reading

time is long enough to accommodate all speeds is often easier than trying to run different timings within a circuit. For certain stations, small adaptations can be made to help ensure it is possible to complete the skill within the standardized time allocation. For example, at bandaging stations opening packaging and finding the end of the cohesive bandage material can be difficult for shaky hands. Therefore, pre-opening materials and folding over the end of the cohesive bandage removes a potential source of time loss for nervous students but has no impact on the overall skill assessment.

Once all the stations are set up, several members of the OSCE team and/or examiners should walk around the whole circuit, checking each station to ensure everything necessary is present and that signage is sufficient to guide students through the circuit.

5. Preparing the examiners

Every task included in an OSCE requires a suitable task-trained examiner who is competent to mark the task being observed. Whilst some clinical skills may require an experienced veterinarian or nurse (veterinary technician) as the examiner, skills such as animal handling and communication can be assessed by experienced technicians, communication tutors, or simulated clients. Including senior faculty members as examiners helps to communicate the importance of engagement with OSCEs and facilitates examiner enrollment. Regardless of their background and expertise, all examiners should receive training and follow the standardized OSCE approach. During training is an opportunity to discuss the details of the overall examination and each examiner's station information pack. Training will help to ensure examiners are assessing students to the required standard, following assessment protocols, complying with local regulations and using the grading tool (checklist or rating scale) appropriately. Furthermore, examiner training should include the recognition of different sources of rater error such as fatigue, distraction and bias,[8,26] so examiners appreciate how such errors can undermine assessment validity,[15] this will improve examiner accuracy and consistency of judgements.[27]

There is evidence that having two examiners per task improves assessment reliability[28]; however, this increases both assessment cost and faculty workload and therefore is not common practice in veterinary OSCEs. Increasing the number of stations within an assessment may have a more positive effect on assessment reliability than doubling examiners.[8] Some institutions use videos to provide an additional level of assessment

scrutiny, offering a means of reviewing student performance if there are concerns relating to a judgement or appeals. Being able to pause and re-wind video recordings can improve rater accuracy,[29] but only if the video provides a clear view of the task. Two cameras may be required to fully capture some tasks, and filming stations that involve live animals can pose challenges due to animal motion and positioning.

The number of examiners required for the OSCE will depend on how many stations are included in the circuit, how many days are needed to assess the entire cohort and how long examiners will spend on active duty. One or more spare examiners should be available so that in the event of illness or injury they can step in. Reserve examiners should ideally be experienced and generalists, able to competently assess as many stations as possible. Conflict exists between the desire to have the same examiner assess every student to ensure consistency[30]and interchanging examiners to prevent fatigue.[31] The cognitive load associated with OSCE assessment is significant.[27,32] Thus Major[31] suggests examiners should be active for no more than half of each day but can be used on multiple days; this recommendation is followed in some of the authors' institutions. Where multiple examiners assess the same task, the team should meet prior to the OSCE to ensure consistency in applying the grading tool, which will improve inter-rater reliability.

6. Preparing the OSCE delivery team

Beyond the examiners, a whole team is involved in setting up, running and administering the OSCE. Administrative staff responsible for timetabling and assessment logistics need to be included in the planning stages to ensure facilities, students, raters, and animals will be available on the proposed assessment dates. The clinical skills team is usually responsible for procurement of resources, setting up and taking down the OSCE stations. Additional staff need to be recruited to facilitate smooth OSCE operation including checking-in the students on arrival, marshaling around the circuit, collecting paperwork, managing information technology such as the timing, sound system and tablets for marking, managing animals if used, and assisting with resetting more complex stations. A senior examiner should be present to oversee the OSCE and assist with any issues or challenges arising on the day.

The OSCE organization team should recognize and reduce sources of interruption during OSCEs to minimize the impact on students and assessment validity. Planning for potential

disruptions is helpful. For example, if there is a problem with an individual station, such as a student accident, issues with an animal, or breakage of equipment that cannot be fixed or replaced, will the circuit be halted? If so, the process to pause the circuit should be overseen by the OSCE team and included in examiner and student briefing. If routine fire alarm tests are planned during OSCEs, consider requesting that they be rescheduled or if that is not possible include a fire alarm warning in the student and examiner briefing. Have a protocol for maintaining the assessment integrity should the fire alarm sound. For example, as students and examiners evacuate the building, they remain together in the fire assembly location and communicate with no one else.

7. Preparing the students

Ultimately the purpose of an OSCE is to support the learning, skill development and progression of students. As well as taught practical classes, students need opportunities for practice and rehearsal with feedback. As the OSCE format may be new to many students, they need to become familiar with the process and have opportunities to develop the associated 'assessment literacy'; this must be incorporated into the curriculum and OSCE preparations.[33,34] An important component to an OSCE station is the time limit in which the student must complete the task, as failure to complete the task within the permitted time can result in failure even if the student's performance is deemed competent up to that point.[5] It is therefore helpful for students to have opportunities to rehearse skills under timed conditions, whether through formative OSCEs or practicing skills with a timer. Formative OSCEs serve to support the development of students' skills but also increase awareness and confidence in the assessment format and reduce anxiety, whilst operating within any logistical constraints imposed by examiner availability and running costs.[18] Student feedback supports the notion that "any mock OSCE is better than no mock OSCE".[35] Peer or near-peer examiners can be used in practice OSCEs to reduce the workload on faculty, and students video recording their performance can facilitate self- and peer-assessment.[35] Demonstrations and video briefings can also provide valuable resources to prepare students for the assessment environment.[36–38]

Prior to the assessment, students need to be briefed on regulations, timing and requirements. This should include any rules or expectations pertaining to clothing, equipment or items not permitted within the assessment center, such as phones and smart

watches. Additionally, students need to be aware of OSCE etiquette such as rules pertaining to talking and verbalizing actions during the assessment. Examiners do not engage in unnecessary small talk or communication that could distract or influence the student. Typically, students are not permitted to speak during OSCEs unless communication is part of the task, as examiners are assessing the student's ability to "Show How" not their ability to verbalize that they "Know How". Students verbalizing their actions can influence assessment decisions if an examiner marks what was heard not seen, may prompt students at an adjacent station if overheard, and of course in the workplace clinicians do not describe the steps in front of clients.

In some institutions, sequestration or quarantining of students following the OSCE is adopted to help prevent collusion, typically ending when the last students start the examination, although the beneficial effect is debated.[8] In purely skills-based tasks, sequestration of students may not be necessary, as knowing the station content ahead of time may not be seen to be an advantage. When stations include knowledge-based components within skills-based tasks (e.g., reading and interpreting the PCV value), then sequestration or other adaptations (e.g., changing the blood sample for each group) may be considered to ensure fairness. However, sequestering students requires an additional room and staff, places considerable time pressures on the students themselves, and contributes to anxiety levels due to waiting.[39]

8. Preparing the animals

Animals may be used in OSCEs to test animal handling and physical examination skills. A station may combine an animal with a model for part of the task, such as for injection techniques. Organizers should carefully consider any use of live animals, as this constitutes an educational use and is therefore likely to be subject to regulations including ethical approval. If animals are used, they will need to be rotated to prevent over-use, so animal handlers should be assigned to facilitate changeover as required. As multiple animals are needed, each should have a 'record card' for the examiner to use as a source of reference, listing the animal's basic identification details including name, ear tag, and microchip. Animal record cards that include a photograph allow for rapid identification, and pertinent information like body condition score, age, clinical history, and temperament can also prove

helpful (Figure 6). The use of animals necessitates additional risk assessments and planning to ensure appropriate handling and housing is available for all the animals required, and this in turn may impact the locations available for the assessment.

Teaching Dog Information for OSCE Examiners

Name:	Ares
Breed:	Alaskan Malamute
Date of Birth:	20/08/2017
Sex/neuter status:	Male (castrated)
Chip number:	981 001 xxx xxx 683
Dietary considerations:	Can have treats
Other information e.g., behavioral, body condition score (BCS), clinical conditions	Reactive with entire male dogs BCS: 4/9 No clinical abnormalities
Chip checked prior to examination (tick to confirm)	☐

Figure 6. An example animal record card for use in examinations.

9. On the day

The core OSCE organization team will need to arrive early to carry out the "on the day" checks, including a final inspection of each station. The examiners and students should have been given detailed instructions on when and where to report to on arrival, and accurate records of attendance must be taken so that absences are rapidly detected and addressed either with adjustments to the student list or use of a spare examiner. Both students and examiners will need to be briefed, including relevant health and safety information. Examiners often receive an additional briefing from the lead examiner for the session and should be directed to check their station including their information pack and equipment.

Each examiner will have a station information pack containing guidance on station operation, marking criteria, resetting the station between students, risk assessment, any specific protocols relating to animal management or handling and disposal of samples. Feedback sheets for examiners to report on both the station set up and grading tool are also useful. The pack should include guidance on acceptable forms of communication during the assessment, including how to respond to student queries. For example, the pack may

include a scripted response such as “please refer to the station scenario, it contains all the information you need to complete the task” and describe what to do if a student raises a concern regarding equipment or a model’s function. Finally, examiners should run through their station by coming in early on the day of the OSCE or, if possible, the day before to ensure they are familiar with the layout.

Examiner fatigue can lead to rater error, so breaks with drinks and food must be factored into the delivery plan to mitigate the negative effect this has on examiner accuracy.[40] There is some evidence to suggest the use of electronic grading tools may reduce examiner fatigue when compared to paper grading tools.[40,41] Whatever grading method is used, either printing costs or IT equipment and support need to be included in budget considerations and examiner training.

10. Post assessment

Once the final group of students has completed the circuit, the process of debriefing, reflection and tidying away the stations and equipment begins. All of the team, including core OSCE organizers, examiners, animal handlers and administrators, should provide feedback on the process, whether on feedback forms or at an in-person de-brief so that any issues are identified to inform future refinements. Asking examiners to list common mistakes made at their station or to record a video at their station before it is packed away can be useful; this can be used to provide cohort level feedback rapidly and generate future learning resources for students to support flipped classroom learning.[42] All paperwork and data must be carefully and securely collated, and the assessment team will begin the process of entering or retrieving and analyzing the results. A psychometrician can assist with data analysis, oversee the standard setting process to establish the pass mark, and determine reliability of the OSCE as a whole, each station and the examiners. Digital marking tools have the advantage of generating results rapidly, and the interface can require complete checklist or rating scale entries to avoid missing data points. When using digital marking tools, some examiners may still prefer to write paper comments for feedback purposes, so this too will need to be captured. The delivery of student feedback will ultimately depend on institutional policy, but ideally all students should receive

individual feedback to support their continued development, and in a suitable timeframe to support those students who must complete remediation assessments.

CONCLUSION

Although the tips we have presented in this article may make the decision to start or increase the use of OSCEs appear daunting, the educational benefits gained by assessing students at the "Shows How" level are significant. We have witnessed firsthand the difference OSCEs can make to student motivation to engage with, practice and master a wide range of animal handling and clinical skills. As veterinary education moves toward becoming competency-based, regular assessment of skills with procedures to retrain and remediate poorly performing students are essential. Incorporating OSCEs into a curriculum requires significant investment from both the institution and delivery team, and we hope this teaching tip can help to support those responsible for delivering these challenging but important and rewarding assessments.

AUTHOR DECLARATIONS:

The authors have no conflict of interest to declare. This work did not receive funding.

ACKNOWLEDGEMENTS

We would like to thank all the individuals involved in OSCEs that we have worked with and learned from over the years at various institutions.

REFERENCES

1. Harden RMG, Downie WW, Stevenson M, Wilson GM. Assessment of Clinical Competence using Objective Structured Examination. Br Med J. 1975;1(5955):447–51. https://doi.org/10.1136/bmj.1.5955.447

2. Miller GE. The assessment of clinical skills/competence/performance. Acad Med. 1990;65(9):S63-7. http://journals.lww.com/00001888-199009000-00045

3. Read EK, Bell C, Rhind S, Hecker KG. The Use of Global Rating Scales for OSCEs in Veterinary Medicine. Ruaux CG, ed. PLoS One. 2015;10(3):e0121000. https://dx.plos.org/10.1371/journal.pone.0121000

4. RCVS. RCVS standards Framework for veterinary nurse education and training. <https://www.rcvs.org.uk/news-and-views/publications/vn-standards-framework/>. Accessed 01/12/2021. Royal College of Veterinary Surgeons, London, UK, 2021.

5. Boursicot KAMM, Roberts TE, Burdick WP. Structured Assessments of Clinical Competence. In: Stanwick T, Forrest K, O'Brien BC, eds. Understanding Medical Education: Evidence, Theory, and Practice. Third. Chichester, UK: John Wiley & Sons, Ltd; 2018. p. 335–45. https://doi.org/10.1002/9781119373780.ch23

6. Daniels VJ, Pugh D. Twelve tips for developing an OSCE that measures what you want. Med Teach. 2018;40(12):1208–13. https://doi.org/10.1080/0142159X.2017.1390214

7. Van Der Vleuten CPM. The assessment of professional competence: Developments, research and practical implications. Adv Heal Sci Educ. 1996;1(1):41–67. https://doi.org/10.1007/BF00596229

8. Boursicot K, Kemp S, Wilkinson T, Findyartini A, Canning C, Cilliers F, et al. Performance assessment: Consensus statement and recommendations from the 2020 Ottawa Conference. Med Teach. 2021;43(1):58–67. https://doi.org/10.1080/0142159X.2020.1830052

9. Brosnan M, Evans W, Brosnan E, Brown G. Implementing objective structured clinical skills evaluation (OSCE) in nurse registration programmes in a centre in Ireland: A utilisation focused evaluation. Nurse Educ Today. 2006;26(2):115–22. https://doi.org/10.1016/j.nedt.2005.08.003

10. Davis MH, Ponnamperuma GG, McAleer S, Dale VHMVHM. The Objective Structured Clinical Examination (OSCE) as a determinant of veterinary clinical skills. J Vet Med Educ. 2006;33(4):578–87.

11. May SA, Head SD. Assessment of Technical Skills: Best Practices. J Vet Med Educ. 2010;37(3):258–65. https://doi.org/10.3138/jvme.37.3.258

12. Brown C, Ross S, Cleland J, Walsh K. Money makes the (medical assessment) world go round: The cost of components of a summative final year Objective Structured Clinical Examination (OSCE). Med Teach. 2015;37(7):653–9. https://doi.org/10.3109/0142159x.2015.1033389

13. Poenaru D, Morales D, Richards A, Michael O'Connor H. Running an objective structured clinical examination on a shoestring budget. Am J Surg. 1997;173(6):538–41. https://doi.org/10.1016/S0002-9610(97)00007-X

14. Boursicot K, Roberts T. How to set up an OSCE. Clin Teach. 2005;2(1):16–20. https://doi.org/10.1111/j.1743-498X.2005.00053.x

15. Royal KD, Hecker KG. Rater Errors in Clinical Performance Assessments. J Vet Med Educ. 2016;43(1):5–8. https://doi.org/10.3138/jvme.0715-112R

16. Harden RM. Twelve tips for organizing an Objective Structured Clinical Examination (OSCE). Med Teach. 1990;12(3–4):259–64. https://doi.org/10.3109/01421599009006629

17. Khan KZ, Gaunt K, Ramachandran S, Pushkar P. The Objective Structured Clinical

Examination (OSCE): AMEE Guide No. 81. Part II: Organisation & Administration. Med Teach. 2013;35(9):142–59. https://doi.org/10.3109/0142159X.2013.818635

18. Gilani S, Pankhania K, Aruketty M, Naeem F, Alkhayyat A, Akhtar U, et al. Twelve tips to organise a mock OSCE. Med Teach. 2021;0(0):1–20. https://doi.org/10.1080/0142159X.2021.1887465

19. Lynagh M, Burton R, Sanson-Fisher R. A systematic review of medical skills laboratory training: where to from here? Med Educ. 2007;41(9):879–87.

20. Ericsson KA. Deliberate Practice and the Acquisition and Maintenance of Expert Performance in Medicine and Related Domains. Acad Med. 2004;79(Supplement):S70–81. https://doi.org/10.1097/00001888-200410001-00022

21. Londgren MF, Baillie S, Roberts JN, Sonea IM. A Survey to Establish the Extent of Flipped Classroom Use Prior to Clinical Skills Laboratory Teaching and Determine Potential Benefits, Challenges, and Possibilities. J Vet Med Educ. 2021;48(4):463–9. https://doi.org/10.3138/jvme-2019-0137

22. Biggs J. Enhancing teaching through constructive alignment. High Educ. 1996;32(3):347–64. https://doi.org/10.1007/BF00138871

23. Swanson DB, Clauser BE, Case SM. Clinical Skills Assessment with Standardized Patients in High-Stakes Tests: A Framework for Thinking about Score Precision, Equating, and Security. Adv Heal Sci Educ 1999 41. 1999;4(1):67–106. https://doi.org/10.1023/A:1009862220473

24. Hall EJ, Simpson A, Imrie H, Ruedisueli N. Time-constrained scenario-based practical examinations (TSPEs): an alternative to OSCEs? Vet Nurs J. 2019;34(6):154–8. https://www.tandfonline.com/doi/full/10.1080/17415349.2019.1604194

25. Connell B, Jones M, Mace R, Mueller J, Mullick A, Ostroff E, et al. Universal Design Principles [Internet]. Centre for Universal Design, North. 1997. <https://projects.ncsu.edu/ncsu/design/cud/about_ud/udprinciplestext.htm>. Accessed 01/12/2021. Centre for Universal Design, North Carolina State University, Raleigh, NC, 1997.

26. Royal K. Forty-five common rater errors in medical and health professions education. Educ Heal Prof. 2018;1(2):33. http://dx.doi.org/10.4103/EHP.EHP_27_18

27. Malau-Aduli BS, Hays RB, D'Souza K, Smith AM, Jones K, Turner R, et al. Examiners' decision-making processes in observation-based clinical examinations. Med Educ. 2021;55(3):344–53. https://doi.org/10.1111/medu.14357

28. Brannick MT, Erol-Korkmaz HT, Prewett M. A systematic review of the reliability of objective structured clinical examination scores. Med Educ. 2011;45(12):1181–9. https://doi.org/10.1111/j.1365-2923.2011.04075.x

29. Tan J-Y, Ma IWY, Hunt JA, Kwong GPS, Farrell R, Bell C, et al. Video Recording in Veterinary Medicine OSCEs: Feasibility and Inter-rater Agreement between Live Performance Examiners and Video Recording Reviewing Examiners. J Vet Med Educ. 2021;48(4):485–91. https://doi.org/10.3138/jvme-2019-0142

30. O'Neill A, McCall JM. Objectivelyassessing nursing practices: a curricular development. Nurse Educ Today. 1996;16(2):121–6. https://doi.org/10.1016/S0260-6917(96)80068-2

31. Major DA. OSCEs – seven years on the bandwagon: The progress of an objective structured clinical evaluation programme. Nurse Educ Today. 2005;25(6):442–54. https://doi.org/10.1016/j.nedt.2005.03.010

32. Byrne A, Soskova T, Dawkins J, Coombes L. A pilot study of marking accuracy and mental workload as measures of OSCE examiner performance. BMC Med Educ. 2016;16(1):1–6. http://dx.doi.org/10.1186/s12909-016-0708-z

33. Rust C, Donovan MP& BO. Improving Students' Learning by Developing their Understanding of Assessment Criteria and Processes, Assessment & Evaluation in Higher Education. Assess Eval High Educ. 2003;28(2):147–64. https://doi.org/10.1080/02602930301671

34. Sambell K, McDowell L, Montgomery C. Chapter 3. Creating Opportunities for Practice and Researshal. In: Sambell K, McDowell L, Montgomery C, eds. Assessment for Learning in Higher Education. Abingdon, UK: Routledge; 2012. p. 49–70. https://doi.org/10.4324/9780203818268

35. Al-haddad U, Durrani M. Response to: Twelve tips to organise a mock OSCE. Med Teach. 2021;0(0):1–3. https://doi.org/10.1080/0142159X.2021.1912312

36. Hall EJ, Simpson A. Using video to support veterinary nursing students preparing for OSCEs. Vet Nurs J. 2018;33(5):145–7. https://doi.org/10.1080/17415349.2018.1428918

37. Massey D, Byrne J, Higgins N, Weeks B, Shuker MA, Coyne E, et al. Enhancing OSCE preparedness with video exemplars in undergraduate nursing students. A mixed method study. Nurse Educ Today. 2017;54:56–61. http://dx.doi.org/10.1016/j.nedt.2017.02.024

38. Bristol Vet School Clinical Skills Lab. A guide to the process: How does an OSCE run? <https://www.youtube.com/watch?v=5mP4Jmxf9mc>. Accessed 01/12/2021. University of Bristol, Bristol, UK, 202

39. Dunne K, Moffett J, Loughran ST, Duggan V, Campion DP. Evaluation of a coaching workshop for the management of veterinary nursing students' OSCE-associated test anxiety. Ir Vet J. 2018;71(1):15. https://doi.org/10.1186/s13620-018-0127-z

40. Swift M, Spake E, Kohia M. Examiner Fatigue and Ability to Concentrate in Objective Structured Clinical Examinations for Physical Therapist Students. J Allied Health. 2016;45(1):62–70. https://www.ingentaconnect.com/content/asahp/jah/2016/00000045/00000001/art00012

41. Schmitz FM, Zimmermann PG, Gaunt K, Stolze M, Guttormsen Schär S. Electronic Rating of Objective Structured Clinical Examinations: Mobile Digital Forms Beat Paper and Pencil Checklists in a Comparative Study. In: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in

Bioinformatics). 2011. p. 501–12. https://doi.org/10.1007/978-3-642-25364-5_35

42. Baillie S, Decloedt A, Londgren MF. Teaching Tip: Designing Flipped Classrooms to Enhance Learning in the Clinical Skills Laboratory. J Vet Med Educ. 2021;e20210043. https://doi.org/10.3138/jvme-2021-0043