Original Article

The International Council of Ophthalmology Ophthalmic Clinical Evaluation Exercise

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Purpose: Fifteen years after the publication of the Ophthalmic Clinical Evaluation Exercise (OCEX), it was deemed necessary to review and revise it, and to validate it for an international audience of ophthalmologists. This study to revise the OCEX and validate it for international use. **Methods:** The OCEX rubric was changed to a modified Dreyfus scale; a behavioral descriptor was created for each category. An international panel of ophthalmic educators reviewed the international applicability and appropriateness of the tool. **Results:** A tool for assessing and giving feedback on four aspects of clinical competence during the ophthalmic consultation (interview skills, examination, interpersonal and communication skills, and case presentation) was revised. The original scoring tool was improved to a new behavioral one, and relevant comments and suggestions from international reviewers were incorporated. The new tool has face and content validity for an international audience. **Conclusion:** The OCEX is the only tool for workplace assessment and feedback specifically for ophthalmology residents and the ophthalmic consultation. This improved and simplified version will facilitate its use and implementation to diverse programs around the world.

Key words: Ophthalmic education, resident assessment, workplace-based assessment

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In 2004, Golnik and collaborators developed the Ophthalmic Clinical Evaluation Exercise (OCEX), aiming to fulfill the Accreditation Council for Graduate Medical Education of the United States' mandate to develop valid and reliable instruments to evaluate residents' competence.[1] The OCEX reliability, an adaptation of the mini-Clinical Evaluation Exercise (mini-CEX) created for internal medicine, was demonstrated in a study of 94 academic programs in the United States, reaching a total statistical alpha coefficient of 0.81.[2,3]

This assessment consists of the observation by an instructor of a clinical encounter between a resident and a patient. The instructor evaluates the different aspects of professional competence during the ophthalmic consultation (interview, examination, interpersonal and communication skills, and case presentation) and grades the resident's performance, guided by a rubric with behavioral descriptors. Part of the process involves giving feedback (and writing recommendations down on the form) and developing with the resident a brief improvement plan.

Fifteen years after the publication of the OCEX, we thought it necessary to review and revise it, as well as to validate it for an international audience of ophthalmologists. The purpose of this study is to present the modifications we made to the instrument and the process of validating its content for training programs around the world.

Methods

The design of this study was exploratory. We used the OCEX developed by Golnik and Goldenhar[3] and maintained the same set of skills as the original instrument. A first draft was prepared by the first author by reclassifying the original OCEX skills and behavioral descriptors into a modified Dreyfus and Dreyfus scale of stages of competence: the categories of the original scoring rubric (does not meet/meets some/meets all/exceeds expectations) were changed to novice, beginner, and competent, each one of them with its corresponding behavioral descriptors.[4] This first draft was first agreed upon by the author of the original OCEX and then sent to the rest of the authors to comment; each author received a personalized draft intending to reduce bias from reading what the rest thought. Each of the authors, educators practicing in different countries

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around the world (Argentina, Cameroon, India, Spain, Tunisia, and the United States of America), reviewed each skill and its behavioral descriptors while answering to the following questions: 1) Is there any important item missing in the questionnaire or the descriptors? 2) Do you think we need to change or delete any items or descriptors; if yes, why? 3) Are the behaviors clearly and accurately defined and described? 4) Would this tool be potentially applicable to your setting or region; if not, why?

We then sent the modified OCEX to a group of 14 educators from the International Council of Ophthalmology Ophthalmic Educators Group (ICO-OEG), practicing in a variety of countries around the world (Bulgaria, Colombia, Congo, Egypt, Hungary, India, Nepal, Philippines, the United Arab Emirates, and the United States of America), who had volunteered to review the instrument.[5] The ICO-OEG is an ICO special interest group, currently consisting of 921 ophthalmologists from around the world. For this study purposes, a call for applications to participate in the ICO-OCEX review panel was sent to all ICO-OEG members who were asked to complete an online application form. The form asked volunteers to provide their city and country, if they had used the OCEX before, a description of interests and skills, and their curriculum vitae. 50 ophthalmologists volunteered, and we selected a panel of 14 ophthalmologists and educators that was geographically diverse, and that had used the OCEX before. We did not get answers from 5 volunteers that were consequently withdrawn from the panel.

Reviewers were asked to review the tool while answering the same questions listed above. We incorporated the comments and suggestions of the nine that finally answered.

We will describe the development of the instrument and the international validation of its content.

The study was considered free of ethical objections by the Hospital Italiano de Buenos Aires Ethics in Research Committee.

Results

The instrument

The new version of the OCEX, as shown in the Appendix, contemplates the evaluation of four aspects of clinical competence during the ophthalmic consultation: interview skills, examination, interpersonal and communication skills, and case presentation. The following are included within *interview skills*: introduction, chief complaint, history of present illness, pertinent negatives, pain inquiry, allergies or adverse reactions to medications, review of systems, medication list, past systemic history, past ocular history, social history and hygienic habits, and family history. The *exam* covers hand/diagnostic instrument hygiene, visual acuity, pupils/relative afferent pupillary defect, confrontational visual fields, motility, external, slit lamp exam, intraocular pressure, and funduscopy. The aspects related to *interpersonal and communication skills* to assess are patient comfort, empathy, respectfulness (e.g., eye contact while listening), understandability, explanation of findings, explained diagnosis, explained plan/options, and asked if the patient had questions. The *case presentation* includes conciseness, clarity, organization; pertinent facts (positive and negative), differential diagnosis, appropriate plan, and response to attending.

We considered it appropriate to clarify some points in the form, to facilitate its interpretation. We defined a "pertinent negative" as an element of the patient's history that aids diagnosis because the patient denies that is present (e.g., a patient with an acute floater should be asked about photopsia to help rule out a retinal tear). We clarified that asking about pain is a requirement in several countries. Also, that listing the medications used by the patient includes ophthalmic and systemic medications currently used, including nutritional supplements and other over-the-counter products, and that social history/hygienic habits include, for example: occupation; tobacco, alcohol, or illegal drugs consumption; family and housing situation; social security.[6]

The scoring rubric comprises three columns, and we developed it according to a modification of Dreyfus and Dreyfus stages of competence: we included only the novice, beginner, and competent stages. We created behavioral descriptors for all the skills in each stage. We also included a column "not applicable", clarifying that it can be used when a specific item is not appropriate or necessary.

In the end we left an open space for specific feedback comments for the resident.

Content validation

Fourteen volunteer educators, members of the ICO Ophthalmic Educators Group, were asked to review the content of the new instrument while answering to a set of four questions; nine responded. We will describe the most significant comments to each of the open-ended questions.

Q1 Are the items and corresponding descriptors clearly defined? Eight reviewers answered positively; one did not answer this question.

Q2 Are we missing anything important? Three respondents answered that nothing important was missing.

One of the reviewers suggested adding an item about dealing with the family, which is a special issue particularly in countries where patients are always accompanied by one or more family members, so we added "family" to the corresponding items listed in communication skills. The same reviewer suggested adding an item about dealing with handicapped or blind patients who may need special help during the examination; we added "consideration of patient comfort, safety, and disabilities" in the item corresponding to patient comfort.

Another reviewer suggested expanding the slit lamp section; we thought that this would make the list too long, so this suggestion was not incorporated. He also recommended adding "suggests appropriate confirmatory testing"; we considered that this was implicit in "case presentation - provides an appropriate and realistic plan".

Q3 "Do you think we need to change/delete any item?" A reviewer declared finding it difficult to assess empathy externally. We believe that there are indirect signs (e.g., tone of voice, pausing, comments, etc.) through which the assessors can make an impression of the resident's empathy. He also suggested combining "pertinent facts" and

"pertinent positives and negatives", so we incorporated this modification.

Regarding interpersonal skills, a reviewer suggested that: 1) specific descriptors on patient comfort (like appropriate adjustment of height and position, not switching on the slit lamp/indirect full illumination on the patient's eye, putting the chair unit back to zero after examination, etc.) could be added to make the assessment more objective; 2) "disrespectful" is a subjective description and interpretation might have cultural variation, and that we could make it more descriptive including the acceptable behavior; 3) some examples on the nonverbal communication skills should be included in the interpersonal skills (like eye contact while listening, gestures etc.); 4) in "explained plan and options", a competent resident can be expected to explain about alternate options and the possible pros and cons and participate in the informed consent decision making. We included all these recommendations in the rubric.

Another reviewer suggested adding "including timing, duration, frequency, intensity, and aggravating and alleviating factors" to the history of present illness; we added these to the rubric.

Another reviewer suggested asking about the results of nonprescription medications, as well as provider qualifications; we considered this too detailed to include.

A reviewer suggested combining the explanation of findings, diagnosis, and plan into one item since all of them serve to show how the resident explains the situation to the patient/family. We consider that they are different situations that require different skills (e.g., when explaining the diagnosis that the patient has a malignant tumor requires other skills than explaining the treatment; or giving detailed explanations on how to use glaucoma medication to attain compliance is different than explaining the diagnosis of glaucoma); therefore, we did not incorporate this suggestion.

Three reviewers suggested to include explaining and obtaining the informed consent, so we incorporated this into the rubric.

One of the reviewers suggested adding "and treatment goals" to the plan explanation by the resident. We considered this to be too detailed and in a certain way implicit in "provide a realistic plan".

Q4 Would this tool be potentially applicable to your setting/region? If not, why? Seven reviewers answered affirmatively, two did not respond.

Discussion

The first version of the OCEX, developed 15 years ago, has been widely and long used in the United States and other countries. In a survey of 56 out of 118 residency programs in the United States (U.S.), Paley and collaborators reported the use of the instrument by more than 50% (31) of U.S. programs.[7] Informal communications with the authors have reported its use in different programs around the world. It has been translated into Portuguese, Chinese, Mongolian, and Spanish.[8] The tool and practical instructions (including example videos) on how to use it have been disseminated by the ICO in its faculty development programs for directors and educators of residency programs around the world.

One of the advantages of this tool, unlike the mini-CEX that inspired its authors, is that it has aspects of the consultation and behavioral descriptors that are specific for ophthalmology.

The original tool has a rubric with descriptors for each item to guide assessors while using the scoring rubric (does not meet/meets some/meets all/exceeds expectations); however, one of the criticisms it has received is the variable interpretation that observers give to the grading scale anchors, which makes difficult to achieve inter-rater reliability.[7] In the aforementioned study, Paley and collaborators retrospectively analyzed OCEX evaluations of 22 second- and third-year residents from two ophthalmology programs over a 3-year period. They were not able to find clinical improvement of residents over time; the varied interpretations of the grading score anchors, the use of a relative rather than the absolute tool's grading scale by evaluators, a lack of clear expectations for each stage of development are among the reasons that the authors list to explain this finding.[7] It seemed therefore appropriate to modify the original tool's grading scale to a scale based on stages of behaviors, such as the Dreyfus scale that would make the year of training less relevant and put more emphasis on actual performance and progression of competence acquisition.

We understand that, as it has been published in other studies about observed assessments, the assessors' judgment is influenced by idiosyncrasies, biases, gestalt, and conflicting contextual factors, as well as the interpretation that they give to the evaluation per se to the scale scores.[9,10]

We reduced the number of rating points to three intending to simplify the use of the rubric by the assessors. In a study that compares a scale of nine with a 5-point scale in the mini-CEX, Cook and Beckman show that, although interobserver reliability is similar for both scales, the 9-point scale seems to provide more accurate scores.[11] Other studies suggest that evaluators have different interpretations of what constitutes, for example, "superior" performance, and when the scale is accompanied by detailed descriptions to guide the evaluation, assessors do not use them.[10] In addition, assessors tend to be reluctant to use categories that may sound pejorative, such as "unsatisfactory" or "poor", or to assign low scores to examinees.[10,12] For all these reasons, and given that we recommend the use of this instrument primarily for the provision of feedback, the simplification of the scale will facilitate its use in training programs.

Another issue about the instrument that was criticized in informal communications with the authors is that it does not contemplate each and every possible situation that may arise in the clinical consultation. Although we have tried to improve some aspects, this granularity escapes the purpose of the instrument. Should situations that are not described in the form or in the rubric arise, the observer may add comments in the space provided for feedback to the resident. Also, not every step of the examination or the interview will be compulsory in every consultation (for example, a confrontational visual field may probably not be needed for a patient who has a corneal

foreign body), so the box "Not applicable" will be useful in these cases.

As it has been published, the value of these observed assessments lies fundamentally in the feedback provided by the observer to the resident and in the possibility of developing with the trainee an improvement plan.[7,13,14] It is advisable to assess several of these encounters to ensure a diversity of cases, situations, and contexts throughout the years of training, and by different examiners.[10,12,15] Residency program directors should consider follow-up of these improvement plans (which should be brief but significant), so that learning and professional development can be truly verified.[16] For summative evaluations, it is recommended that this be one more tool in the range of assessments used.[17,18]

The review process by educators from a variety of regions in the world is worth noting, as well as the fact that the instrument was of interest and applicable in diverse contexts. We were able to incorporate suggestions and modifications that will expand the possibility of using the tool in programs around the world (we removed, for example, the reference to "shakes hands" from the original instrument, since as one of the reviewers noted, this practice is not accepted everywhere). We believe that these recommendations increase the face and content validity of the tool since they collect opinions from international ophthalmologists and educators, different from the US authors that developed the original OCEX and the 18 content experts that established its face and content validity, and the panel of 94 academic ophthalmology teaching faculty that determined its reliability and construct validity.[1,2] Considering that part of the mission of the ICO is to enhance ophthalmic education around the world, and specifically for the ICO's "Teaching the Teachers" initiative to increase the quality of ophthalmic training around the world, opinions of educators from different programs around the globe on how valid all the aspects of competency included in the OCEX are, would be crucial to ensure the feasibility of the use of the tool in other settings than the US-based ones, especially for domains of competence such as Professionalism and Interpersonal and Communication Skills that may be culturally variable. We used this kind of content validation (review by a panel of international educators) for other published surgical and clinical competence assessment instruments.[19-27]

Among the limitations of our work, we can mention the fact that this version of the instrument has not yet been used, the number of international reviewers is relatively small, and reviewers representing cultures such as China and Russia that have large numbers of ophthalmology residents did not participate.

A number of implications for medical education and future research may emerge from this study: 1) testing the tool to demonstrate other aspects of its validity; 2) testing the tool in different years of residency to demonstrate residents' progression throughout their years of training; 3) creating more granular evaluation rubrics for procedures (direct observation of procedural skills - DOPS), especially for some complex procedures included in the OCEX, such as the use of the slit lamp, gonioscopy, or funduscopy that could be used for decisions related to the ACGME milestones or entrusted professional activities; 4) developing a training program for evaluators, to help them with the interpretation of the rubric, the provision of quality feedback, and to develop a plan of improvement with the resident.[9,14,28-32]

To our knowledge, no studies have been published demonstrating how the OCEX improved the evaluation of candidates as compared to a group that has not been evaluated. However, Al Ansari and collaborators conducted a meta-analysis of 11 published studies from 1995 to 2012 that reported the relationship between a similar clinical observation assessment, the mini-CEX, and other standardized academic and clinical performance measures. They demonstrated construct and criterion validity of this tool that was supported by small to large effect-size differences based on measures between trainees' achievement and clinical skills performance, indicating the importance of this kind of assessment tool for the direct observation of trainees' clinical performance.[17]

Conclusion

In conclusion, the OCEX continues to be the only tool for workplace assessment specifically of ophthalmology residents and the ophthalmic consultation. This improved and simplified version will facilitate its use in the observed assessment of residents' competence and delivery of feedback. The international experts' opinion of its relevance and applicability will facilitate its implementation to diverse programs around the world.

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Conflicts of interest

There are no conflicts of interest.

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Appendix: The ICO-OCEX

The International Council of Ophthalmology Ophthalmic Clinical Evaluation Exercise

The ICO-OCEX is an observed encounter between a resident and a new patient. The evaluator should be present in the exam room for the entire interaction. The intent is to rate the resident in all the categories listed below and then provide immediate performance feedback.

Please circle or highlight the box according to the resident's performance.

Interview skills

Skill	Novice	Beginner	Competent	Not applicable[1]
Introduction	Does not introduce himself/herself.	Introduces self, does not explain role in team.	Introduces self, explains role in team.	
Chief complaint	Does not elicit a chief complaint or makes a couple of quick questions.	Elicits chief complaint but lacks relevant details.	Elicits chief complaints and details (subtle and relevant).	
History of present illness (HPI)	Does not elicit HPI.	HPI lacks relevant details.	HPI includes relevant details (e.g., timing, duration, frequency, intensity, aggravating and alleviating factors).	
Pertinent negatives[2]	Does not elicit pertinent negatives.	Elicits a few or irrelevant pertinent negatives.	Elicits important pertinent negatives.	
Pain inquiry[3]	Does not elicit.	Pain is elicited, not characterized.	Elicits scale rating of pain (0-10), characteristics, relieving and exacerbating factors.	
Allergies or adverse reactions to medications	Does not elicit.	Elicits medical (or environmental if appropriate) allergies or adverse reactions to medications without symptom detail.	Elicits medical (or environmental if appropriate) allergies or adverse reactions to medications with symptom detail.	
Review of systems	Does not elicit.	Elicits incomplete review of symptoms.	Elicits appropriate review of symptoms.	
Medication list (including corticosteroids)[4]	Does not elicit.	Obtains list, no dosage/ frequency.	Obtains list with dosage/ frequency, duration of herbal/ traditional/nonprescribed remedies.	
Past systemic history	Does not elicit.	Omits relevant details, or includes irrelevant details.	Obtains relevant details.	
Past ocular history	Does not elicit.	Omits relevant details, or includes irrelevant details.	Obtains relevant details.	
Social history/ Hygienic habits[5]	Does not elicit.	Omits relevant details, or includes irrelevant details.	Obtains relevant details.	
Family history	Does not elicit.	Omits important details, or includes irrelevant details.	Obtains important and relevant details.	

[1]This includes situations where a specific item may not be appropriate/needed.

[2]A pertinent negative is an element of the patient's history that aids diagnosis because the patient denies that it is present (e.g., A patient with an acute floater should be asked about photopsia to help rule out a retinal tear).

[3]Pain inquiry is a requirement in many countries.

[4]Ophthalmic and systemic medications currently used, including nutritional supplements and other over-the-counter products.*

[5]E.g.,: occupation; tobacco, alcohol, illicit drug use; family and living situation; social security; as appropriate*

*AAO Preferred Practice Pattern: Comprehensive Adult Examination, 2015

Examination

Skill	Novice	Beginner	Competent	Not applicable
Hand/diagnostic instruments hygiene	Does not sanitize hands/diagnostic instruments.	Sanitizes hands/diagnostic instruments before encounter.	Sanitizes hands/diagnostic instruments before and after encounter.	
Visual acuity	Does not check.	Checks, but not best corrected, or only pinhole, or some incorrect aspects of technique (distance or illumination).	Checks uncorrected and best corrected, distance and near, with refraction. Correct technique.	
Pupils/RAPD	Does not check.	Does part of the pupillary exam correctly.	Checks light reaction and for RAPD, size, symmetry, and uses correct technique.	
Visual fields (confrontational)	Does not check.	Confrontational VF done, but some aspect of the technique is incorrect (position of hands, or display of target, or distance to patient).	Confrontational VF done correctly.	
Motility	Does not check.	Checks movements incompletely or with incorrect technique in some aspect.	Checks ductions, versions and alignment (cover/uncover, cross-covered testing) in primary position.	
External	Does not check.	Checks incompletely (e.g., without measurements, or only some aspects).	Checks completely as appropriate (e.g., proptosis, lids normal color and position, skin, facial sensation/ strength, head posture, etc.).	
Slit lamp exam	Does not check.	Checks incompletely (e.g., does not check AC depth or aspect or gonioscopy when shallow AC, scarce illumination techniques).	Checks completely, including AC depth and aspect and gonioscopy when shallow AC, all appropriate illumination techniques.	
IOP	Does not check.	Checks but with poor technique.	Checks IOP correctly.	
Funduscopy	Does not check.	Checks but with incorrect technique/ device (e.g., does not check all fundus zones, uses indirect ophthalmoscopy to assess optic disc, difficult and too long examination).	Checks fundus correctly and with appropriate technique and device.	

Interpersonal and Communication Skills

Skill	Novice	Beginner	Competent	Not applicable
Patient Comfort	No explanation to patient on examination process, no consideration of patient's disabilities.	Limited explanation. Not proper consideration of patient comfort, safety, and disabilities.	Explanation on reason for examination. Consideration of patient comfort (e.g., appropriate adjustment of slit lamp height and chair position, not switching on the slit lamp/indirect full illumination on patient eye, putting chair unit back to zero after examination), safety, and disabilities.	
Empathy	Lacks empathy.	Appears superficially interested in patient/family's concerns.	Demonstrates understanding of patient/family's concerns, provides appropriate comfort.	
Respectfulness (e.g., eye contact while listening, gestures)	Disrespectful; inappropriate body language.	Curt, does not listen to all of patient/family's questions/ concerns; questionable body language.	Listens to patient/family, responds to patient/family questions/ concerns. Appropriate body language.	
Understandability	Constantly uses medical jargon the patient does not understand.	Occasionally uses medical jargon the patient does not understand.	Avoids or explains medical terms when used and makes sure he/ she is understood (e.g., asking, rephrasing).	
Explanation of findings	Provides no explanation.	Cursory explanation.	Effectively and efficiently explained all pertinent findings.	
Explained diagnosis	Provides no explanation.	Cursory explanation.	Thoroughly explained diagnosis.	
Explained plan/ options	Provides no explanation.	Cursory explanation.	Thoroughly explained plan (including alternate options, possible pros and cons/ complications). If interventions are indicated, fills in and explains informed consent and obtains signature, when appropriate.	
Asked if patient had questions	Does not ask.	Asked but did not answer completely.	Asked and answered questions thoroughly. If interventions are indicated, fills in and explains informed consent and obtains signature, when appropriate.	

Case Presentation

Skill	Novice	Beginner	Competent	Not applicable
Conciseness, clarity, organization	Unintelligible.	Somewhat disorganized.	Clear, concise, organized.	
Pertinent facts (positives and negatives)	Omits pertinent facts.	Omits minor supporting facts.	Covers all pertinent facts.	
Differential diagnosis	Does not mention.	Provides basic but incomplete differential.	Provides appropriate and thorough differential.	
Appropriate plan	Does not mention.	Provides basic, correct but incomplete or unrealistic plan.	Provides appropriate and realistic plan, asks for patient's consent.	
Response to attending	Inappropriate.	Listens but little response.	Listens and responds appropriately and with an improvement plan.	

Specific feedback comments for the resident:

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Name of resident: **Name of assessor:**