Ophthalmology Foundation

International Direct Observation of Clinical Skills (IDOCS): Subjective Refraction

The IDOCS: Subjective Refraction rubric was developed by a panel of international subject matter experts with the intent of providing clinical educators ("evaluators" and "trainers") with an internationally-standardized rubric to teach trainees and assess their competency in subjective refraction. The process of subjective refraction has been divided into 15 critical steps with detailed behavioral descriptions corresponding to four levels of performance: Novice, Beginner, Advanced Beginner, and Competent.

Subjective refraction relies on a significant amount of patient interaction, and as such the refractionist-in-training (trainee) needs to explain the process, ask appropriate questions, listen to the patient's responses, decide on next steps, and act accordingly. Effectively communicating with the patient throughout the process is vital to an efficient and accurate subjective refraction. The evaluator is encouraged to consider the appropriateness of the trainee's interaction with the patient throughout the refraction process.

TEACHING and ASSESSMENT INSTRUCTIONS:

1. Trainers may use the rubric as a training tool and trainees may use the rubric as a learning guide on performing the steps of subjective refraction. This is a guide and does not intend to be fully inclusive of every detail or technique.
2. An evaluator may observe and evaluate the performance of a trainee's subjective refraction using the rubric or the trainee may self-assess using the rubric to assess their recently performed refraction. (The line-item descriptors in **red bold font** are considered **mandatory** for competency.)
    a. Evaluators should review and discuss the rubric before the first evaluation session. If there are multiple evaluators in a program, it is recommended that all the evaluators conduct one or more of the initial evaluations together to facilitate an internal consensus on how to rank each step. Please keep in mind the importance of the trainee's verbal interactions with the patient at every step, in addition to the physical steps of refracting.
    b. The evaluator (or trainee if self-evaluating) may rank the level of performance of each step by selecting (circling) the corresponding behavioral descriptor for the observed performance at each step.
    c. A cumulative overall score can be calculated by adding the line item scores:
        Novice: <60 points
        Beginner: 60-75 points
        Advanced Beginner : 76-91 points with item scores ≥ 4 in all mandatory categories
        Competent: 92-100 points with all item scores ≥ 4, and item scores in all mandatory categories = 5
    d. Additional comments by the trainer/evaluator are strongly encouraged to provide the trainee with a detailed understanding of which steps were done well and which steps need improvement. This will help maximize the educational value of the rubric.
    e. Timely and detailed discussion of the results of the assessment between the trainer/evaluator and the trainee is also an invaluable part of effective education.
    f. Discussion, development, and implementation of a subsequent detailed plan for additional training, practice, or modified performance within a set timeframe is strongly encouraged to accelerate skill development in this area. Ensuing repeat evaluations may need to be scheduled.
    g. The evaluation may occur more than once as the novice trainee practices and gains more experience with subjective refraction. The goal would be to work towards higher performance levels with additional experience until all steps are performed at the Competent level.

Figure 1

International Direct Observation of Clinical Skills (IDOCS): Subjective Refraction

Evaluator:		**Refractor Type:** [ ] Phoroptor→ [ ] Trial Frame **Age of Patient:** (Intended for patients ≥15 years)		**Trainee:** **Date:**	
	Critical Steps	**Novice** Each Step Score = 2	**Beginner** Each Step Score= 3	**Advanced Beginner** Each Step Score= 4	**Competent** Each Step Score = 5
1	**Interact with the Patient** Communicating well with the patient throughout the process is important to maximizing the success and efficiency of subjective refraction.	Does not provide guidance to the patient unless prompted.	Only one of these is performed: [ ] Gives patient clear instructions [ ] Asks patient appropriate questions [ ] Allows appropriate time for patient to view lenses and respond [ ] Listens to patient's answers [ ] Decides next step, acts accordingly.	Two to four of these are performed: [ ] Gives patient clear instructions [ ] Asks patient appropriate questions [ ] Allows appropriate time for patient to view lenses and respond [ ] Listens to patient's answers [ ] Decides next step, acts accordingly	**All five of these are performed:** **[ ] Gives patient clear instructions** **[ ] Asks patient appropriate questions** **[ ] Allows appropriate time for patient to view lenses and respond** **[ ] Listens to patient's answers** **[ ] Decides next step, acts accordingly.**
2	**Set Up Equipment** Selects the correct chart/non-accommodating target. Adjusts lighting as needed. Ensures clean equipment is at the correct distance from the patient, Vertex Distance (VD) and Pupillary Distance (PD) are adjusted, Phoroptor→ convergence levers are out, and Phoroptor→/ trial frames are level. Chooses correct starting point, either zeroed out or enter starting point SPH, CYL, AXIS.	Does not set up chart or adjust room/chart lighting.	One of these is performed: [ ] Selects appropriate chart [ ] Sets up chart correctly [ ] Adjusts room/chart lighting correctly	Two of these are performed: [ ] Selects appropriate chart [ ] Sets up chart correctly [ ] Adjusts room/chart lighting correctly	**All three of these are performed:** **[ ] Selects appropriate chart** **[ ] Sets up chart correctly** **[ ] Adjusts room/chart lighting correctly**

		Does not position the Phoroptor→ (or trial frame).	One of these is performed: [ ] Follows all appropriate infection control procedures [ ] Enters starting point if available OR [ ] starts from zero SPH, CYL, and AXIS [ ] Correctly sets PD, VD, and level [ ] Correctly positions Phoropter®/trial frame	Two or three of these are performed: [ ] Follows all appropriate infection control procedures [ ] Enters starting point if available OR starts from zero SPH, CYL, and AXIS [ ] Correctly sets PD, VD, and level [ ] Correctly positions Phoroptor→ /trial frame	All four of these are performed: **[ ] Follows all appropriate infection control procedures** [ ] Enters starting point if available OR starts from zero SPH, CYL, and AXIS [ ] Correctly sets PD, VD, and level [ ] Correctly positions Phoroptor→ /trial frame
		Does not position patient.	One of these is performed: [ ] Aligns patient with chart [ ] Positions patient at correct distance from chart [ ] Ensures nothing is obstructing the patient's view [ ] Ensures patient is positioned comfortably [ ] Occludes fellow eye	Two to four are performed: [ ] Aligns patient with chart [ ] Positions patient at correct distance from chart [ ] Ensures nothing is obstructing the patient's view [ ] Ensures patient is positioned comfortably [ ] Occludes fellow eye	All five of these are performed: [ ] Aligns patient with chart [ ] Positions patient at correct distance from chart [ ] Ensures nothing is obstructing the patient's view [ ] Ensures patient is positioned comfortably [ ] Occludes fellow eye
3	**Determine Sphere Power** GOAL: To determine the most plus/least minus sphere power that gives the best vision.[1,2]	Does not check sphere power at all.	Does not check sphere power first.	Checks sphere power first, but does not correctly determine the most plus/least minus sphere power that gives the best vision.	**Correctly determines the most plus/least minus sphere power that gives the best vision. (Max Plus, Least Minus, Max Visual Acuity)**
4	**Determine Presence of Astigmatic Correction** GOAL: To determine the approximate location of any cylinder axis either by[1,2] [ ] Jackson Cross Cylinder (JCC), by checking at: 180°, 135°, 90°, 45°[1] OR [ ] An alternative method.	Does not identify if cylinder power is present from the starting point SPH, CYL, and AXIS.	Identifies that cylinder power is present but unsure of next steps.	Identifies cylinder power is present but performs unnecessary steps.	Correctly identifies that cylinder power is present from the starting point and moves to the next step.

		Does not know how to determine if astigmatic correction is present using JCC or appropriate alternative method.	Attempts to detect cylinder with JCC or appropriate alternative method, but does not perform the detection method correctly.	Attempts to detect cylinder with JCC or appropriate alternative method correctly but fails to check at 180°, 135°, 90°, and 45°when necessary.	**Detects if cylinder power is present and the approximate location of the cylinder axis by using JCC or appropriate alternative method to check at 180°, 135°, 90°, and 45° when necessary.**
5	**Refine Cylinder Axis** GOAL: To refine the cylinder axis by using the CYL axis mode of the JCC.[1,2]	Does not refine the cylinder axis.	Attempts to refine the cylinder axis but does so incorrectly, for example, uses the CYL power mode of the JCC.	Roughly refines the cylinder axis using the JCC but does not bracket correctly.	**Accurately refines the cylinder axis using the axis mode of the JCC and brackets correctly.**
6	**Refine Cylinder Power** GOAL: To measure cylinder power using the CYL power mode of the JCC.[12,]	Does not refine the cylinder power.	Attempts to refine the cylinder power but does so inaccurately or ineffectively.	Refines the cylinder power correctly, but does not adjust the sphere power accordingly.	**Accurately refines the cylinder power using the JCC, adjusts sphere accordingly by adding -0.25 DS change for every +0.50 DC change (or +0.25 DS for every -0.50 DC change)**
7	**Refine Sphere Power** GOAL: To determine the most plus/least minus sphere power that gives best vision.[1,2]	Does not refine the sphere power.	Attempts to refine the sphere power but does so inaccurately or ineffectively.	Attempts to refine the sphere power but does not determine the most plus or least minus sphere power accurately.	**Accurately refines the sphere power to determine the most plus or least minus sphere power that gives the best vision.[1]**
8	**Avoid Excess Sphere Power** [ ] Monocular Duochrome (Red-Green) [ ] Monocular +1.00 Blur Test [ ] Alternative technique	Does not perform Duochrome, +1.00 Blur Test, or appropriate alternative technique.	Attempts Monocular Duochrome, +1.00 Blur Test, or appropriate alternative technique but does not perform the technique accurately.	Performs either Monocular Duochrome, +1.00 Blur Test, or appropriate alternative technique but does not adjust sphere power correctly in each eye.	**Performs either Monocular Duochrome, +1.00 Blur Test, or appropriate alternative technique correctly and accurately adjusts sphere power in each eye.**

9	**Refract Fellow Eye** Repeat Steps 1-7 on fellow eye. Evaluator may comment here or in steps above.	• Initial SPH • (Determine Astigmatic Correction) • Refine CYL Axis • Refine CYL Power • Refine SPH/ Avoids Excess SPH Power	*No points here, but can add points to sections above for second eye.*		
10	**Perform Binocular Balance**[2] [ ] Prism Dissociation [ ] Alternate Occlusion [ ] Humphriss Immediate Contrast Technique	Does not perform any techniqu for binocular balance.	If indicated, attempts to perform binocular balance but does not perform accurately.	If indicated, performs, but does not fully adjust sphere powers correctly in both eyes.	If indicated, performs steps of a binocular balance technique correctly and accurately adjusts the sphere power in both eyes.
11	**Determine Final Distance Visual Acuity (VA)** Monocularly and binocularly.	Does not determine final distance VA.	Attempts to determine distance VA but does not do so accurately.	Accurately determines distance VA monocularly or binocularly but not both.	**Accurately determines distance VA, both monocularly with each eye and binocularly.**
12	**Determine Overall Accuracy** Evaluator rechecks refraction for accuracy of the final result.	Trainee is unable to determine sphere power, or sphere power is > ± 1.00 DS off from Trainer's results.	Trainee's sphere power is > ±0.75 DS off from Trainer's results in at least one eye.	Trainee's sphere power is within ± 0.50 DS of Trainer's results in at least one eye.	**Trainee's sphere power is within ± 0.25 DS of Trainer's results in both eyes.**
		Trainee is unable to determine cylinder power or cylinder power is >±1.00 DC off from Trainer's results.	Trainee's cylinder power is > ± 0.75 DC off from Trainer's results in at least one eye.	Trainee's cylinder power is within ± 0.50 DC of Trainer's results in at least one eye.	**Trainee's cylinder power is within ± 0.25 DC of Trainer's results in both eyes.**
		Trainee is unable to determine cylinder axis or cylinder axis is >25° from Trainer's results.	Trainee's cylinder axis is >20° off from the Trainer's results for cylinder powers between 0.50 to 0.75 DC or >15° off for cylinder powers ≥ 1.00 DC in at least one eye.	Trainee's cylinder axis is 15°-20° off from the Trainer's results for cylinder powers between 0.50 to 0.75 DC or 10°-15° off for cylinder powers ≥ 1.00 DC in at least one eye.	**Trainee's cylinder axis is < ±15° of Trainer's result for cylinder powers between 0.50 to 0.75 DC or < ±10° for cylinder powers ≥ 1.00 DC in both eyes.**

13	**Document Results**	Did not document refraction results at all or documents very poorly including mixing up the laterality.	Attempts to document refraction results but does so inaccurately.	Documents sphere, cylinder, axis accurately, including using correct nomenclature (signs, units, and proper decimal points included) in one eye but not both.	**Accurately documents the sphere, cylinder, and axis using correct nomenclature (signs, units, and decimal points) for both eyes in the patient's chart.**
		Unsure how to document unusual findings.	Documents unnecessary or incorrect information.	Documents unusual findings but not accurately or thoroughly.	Accurately documents relevant unusual findings, if applicable. If not applicable, can give examples of when and what to document.
14	**Clean/Store Equipment**	Does not clean or store equipment.	Stores but does not properly clean equipment.	Cleans but does not properly store equipment.	Cleans and stores equipment properly per practice standards.
15	**Determine Overall Speed and Fluidity**	Hesitant, frequent starts and stops, and/or unable to complete refraction.	Occasionally starts and stops, inefficient and unnecessary steps are common.	Makes occasional inefficient and/or unnecessary steps.	Refraction process and movements are smooth, and avoids inefficient and unnecessary steps.
	Score for Each Level:	**(# x 2) = _____**	**(# x 3) = _____**	**(# x 4) =_____**	**(# x 5) = _____**
	Determine Overall Score Sum the total score of all columns Novice, Beginner, Advanced Beginner, and Competent **= _____**	**Novice** **Overall Score** **< 60 points**	**Beginner** **Overall Score** **= 60-75 points**	**Advanced Beginner** **Overall Score = 76-91 points,** with item scores ≥ 4 in all **mandatory** categories.	**Competent** **Overall score = 92-100**, with all item scores ≥ 4, and with item scores =5 in all **mandatory** categories.
Additional Comments from Evaluator **Recommendations for Next Steps**					

Karl C Golnik., et al. "An Internationally Validated Direct Observation of Clinical Skills Rubric for Subjective Refraction". Acta Scientific Ophthalmology 5.8 (2022): 86-92.