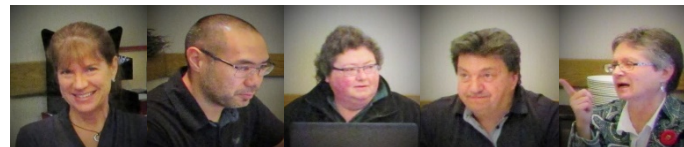




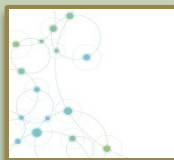
CEO | ECO

Canadian Assessment of Competence in Optometry

Summary Report 2014-15



Our vision: be the recognized leader in competence assessments for optometry in Canada.



MESSAGE FROM
OUR C.E.O. >

2014-15 ADMINISTRATION RESULTS >

ASSESSING COMPETENCY
WITH CONFIDENCE >

A Message from our C.E.O.

In 2014-15, CEO-ECO successfully advanced its strategic plan. With the support of staff, specialists, volunteers and the board, CEO-ECO updated its exam administrative policies. We engaged the profession to validate the new CACO competency profile. And, we developed a new CACO blueprint — both are the foundations of a defensible exam. These key activities ensure the CACO remains valid, legally defensible and a relevant entry-to-practice exam for members and all stakeholders. Here are the highlights for 2014-15.

- Five CACO administrations — in whole or in part
- New communication skills testing — as of April 2015
- Updated examination policies
- New competency profile and exam blueprint, and
- New continuing education credit model to quantifiably recognize optometrists' volunteer time.

This year, CEO-ECO also discontinued administration of the written Prior Learning Assessment (PLA) for foreign-educated professionals (non-ACOE graduates). The last written PLA was administered in February 2015. The College of Optometrists of Ontario and Touchstone Institute is administering an Evaluating Examination to international graduates.

This report was prepared in consultation with our psychometrician, Dr. Anthony Marini, Martek Assessments Ltd.

“CEO-ECO completed the first profession-validated national competency profile for entry to practice in Canada.”



TAMI HYNES
Chief Executive Officer

CACO Administrations

Five administrations, two locations: In this administration cycle, CEO-ECO delivered three CACO administrations at the University of Waterloo School of Optometry and Vision Sciences. Another two administrations were held at the École d'optométrie du université de montréal. CACO administrations were held:

- October 2014 (written only) in Waterloo,
- October 2014 in Montreal,
- April 2015 (clinical skills only) in Waterloo, and
- May 2015 in Waterloo and in Montreal.

2014-15 CACO performance highlights

New communication skills testing implemented: Starting with the April 2015 administrations, CEO-ECO successfully implemented the redesigned CACO skills exam. Three 10-minute communication Objective Structured Clinical Exam (OSCE) stations provide candidates an opportunity to interact with standardized patients (SPs), e.g. individuals from a Standardized Patient Program. Using SPs in a set scenario ensures a consistent assessment experience for all candidates. To learn more about the [communication skills stations](#), visit our website.

Candidates challenging the CACO: CEO-ECO saw 300 candidates this year compared to 297 candidates last year. We also saw fewer first attempt candidates, at 257 compared to 272 last year. This represents a 5.5% decrease from last year. This cycle, we also noted 80 first attempt candidates were educated at schools in the United States as compared with last year when there were 107 candidates. The [CACO Candidates – Four year Trend](#) highlights total candidate volume.



TAMI HYNES
Chief Executive Officer

Pass rates up marginally from last year: The CACO 2014-2015 Administrations Scorecard provides pass rates by candidate subgroup and by attempt. This year, the total pass rate was 83.7%, up marginally from 81.5% in the previous year. The total pass rate amalgamates Canadian, US and internationally-educated candidate performance and reflects the diversity of the subgroups.

Likewise, we saw 257 first attempt candidates challenging the CACO this year. The first attempt pass rate was comparable at 77.4% versus 77.2% last year. Pass rates for first attempt candidates by Canadian and US-educated subgroups increased by almost 3% to 88.7% and by 1.5% to 80.0% respectively. At the same time, first attempt pass rates for internationally-educated candidates increased by 4% to 47.2%, up from 43.2%.

Both the [CACO Candidate Performance – Three-year Pass Rate](#) and [Three-year Fail Rate](#) charts illustrate that Canadian-educated candidates exhibit stronger performance, followed by US-educated candidates.

Updated exam administration policies — ensuring integrity, transparency and fairness

This year, CEO-ECO continued to undertake changes to improve exam integrity, transparency and fairness. In 2014-15, that work included updating our exam administration policies to support the validity and defensibility of the CACO. We completed an extensive review and stakeholder consultation to update the Exam Eligibility/Retake policy and implemented the updated policy in June.

In addition to the eligibility policy, CEO-ECO worked with a policy analyst to revise the following examination policies ensuring transparency and fairness.

“CEO-ECO continued to undertake changes to improve exam integrity, transparency and fairness.”



TAMI HYNES
Chief Executive Officer

- Misconduct (Discipline) policy, which defines improper conduct, penalties and how such conduct will be dealt with by CEO-ECO and a Discipline Committee. This newly established board committee and the C.E.O. administer the policy.
- Appeals policy, which defines how candidate concerns are dealt with and permits up to three levels of appeal. The C.E.O. and two new board committees administer the Appeals policy.
- Scoring/Rescoring
- Accommodations
- Cancellations/Refunds

These exam policies are set by the board of directors and are made accessible to candidates through our bilingual website under the [Policies](#) Tab.

New profession-validated competency profile: new exam blueprint

In May 2015, CEO-ECO completed the first profession-validated national competency profile for entry to practice in Canada. Competency is defined as the ability to perform a practice task with a specific level of proficiency. The new competency profile consists of 92 competencies, required for safe, effective and ethical practice as optometrists enter the profession and begin their careers.



TAMI HYNES
Chief Executive Officer

The profile, which was developed by a team of optometrists working with a competency consultant, was validated through a Canada-wide survey in January. More than 5,000 optometrists from across the country were invited to participate in the process. Some 1,185 or about 23% of optometrists responded to the survey. Their responses around the importance of each competency, the frequency of use and the relevance at entry-to-practice were used to refine the competency profile.

CEO-ECO members and other stakeholders attended a consultative review held in April as a final step in the validation process of the new competency profile.

Between June and September 2015, a selected panel of practitioners built the new exam blueprint, which will focus future CACO exams (starting 2016-17) on assessing candidate professional judgement based on required entry-level competency. This shift aligns with the entry level examinations in other health professions and positions optometrists as front-line health care providers. The new exam blueprint is strongly aligned with the new profession-validated competency profile.

This vital work was funded entirely by CEO-ECO. In 2015-16, exam development teams will align CACO written and practical exams with the new blueprint in preparation for 2016-17 exam administrations.



TAMI HYNES
Chief Executive Officer

“The new exam blueprint will focus future CACO exams on assessing candidate professional judgement based on required entry-level competency.”

A new quantifiable continuing education credit model for volunteer optometrists

CEO-ECO is fortunate to work with such a committed group of volunteer optometrists, without whom it would be impossible to deliver a relevant and cost-effective assessment of competency in optometry. This year, CEO-ECO took steps to recognize the educational value of the volunteer experience in a way that objectively quantifies the value of the volunteer hours for each exam role versus the number of hours volunteered.

The new model underwent a validation process with experienced exam volunteers and the board of directors. The board approved the model at the end of 2014-15. CEO-ECO plans to roll out its new continuing education credit system in fall 2015.

This is an opportunity for the profession to move towards a common or standardized recognition of the educational value of our exam development and administration activities. It is our hope that optometry regulators will adopt the new model.



Tami Hynes
Chief Executive Officer

“CEO-ECO took steps to recognize the educational value of the volunteer experience in a way that objectively quantifies the value of the volunteer hours for each exam role...”



TAMI HYNES
Chief Executive Officer

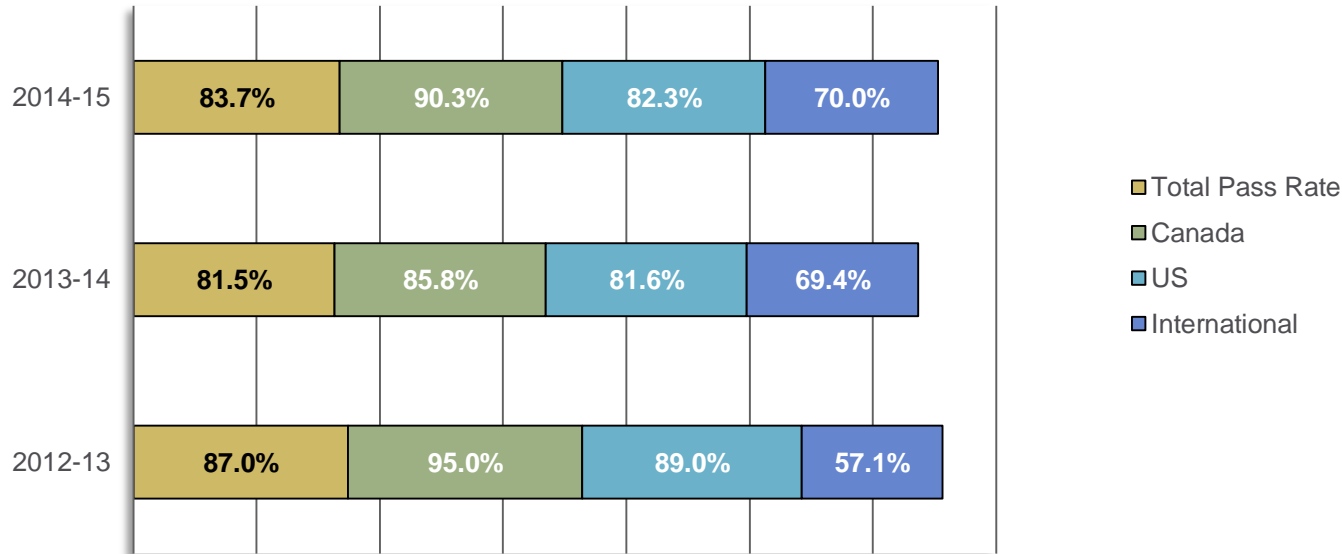
CACO Administrations Scorecard — 2014-15

	Canadian				US				International				<u>Total Pass Rate</u> (All groups in All attempts)
	First Attempt	Second Attempt	Third Attempt	Total CDN	First Attempt	Second Attempt	Third Attempt	Total US	First Attempt	Second Attempt	Third Attempt	Total INT	
Pass Rate	88.7%	100%	100%	90.3%	80.0%	92.9%	66.7%	82.3%	47.2%	66.7%	50.0%	70.0%	83.7%
Candidate Totals	110/124	19/19	1/1	130/144	64/80	13/14	2/3	79/96	25/53	14/21	3/6	42/60	251/300

For the purposes of interpretation, a small number of candidates undertook two administrations. Some candidates are counted as both first attempt and second attempt. For example, of the 21 international candidates who took a second attempt, 20 of these were part of the first attempt. No first or second attempt candidates were third attempt candidates in this reporting year.

A pass is conferred on a [candidate](#) when he/she meets or exceeds the minimum performance level for each of the CACO's components.

CACO Candidate Performance – Three-year Pass Rates

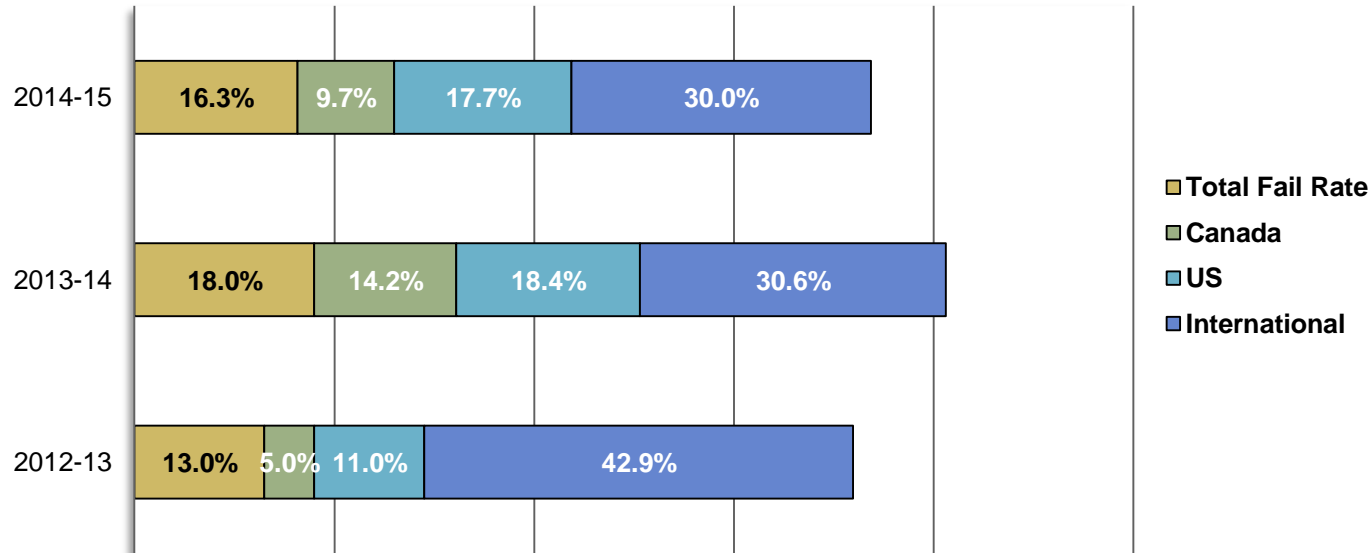


The reporting period is October 1 to September 30 for the past three examination years, starting 2012-13. Over time this chart will evolve into a rolling five-year trend of CACO pass rates. This chart begins in 2012-13 because exam performance in 2011-12 included the old CSAO.

The data in the table presents pass rates collapsed across the three subgroups (Canadian-educated, US-educated and Internationally-educated) which make up the overall candidate pool. Given the diversity within and across the candidates, performance level for each of the three main subgroups is also reported.

Pass rates are collapsed across the subgroups (Canadian-educated, US-educated and Internationally-educated) that make up the overall candidate pool. Given the diversity within and across the candidates, the performance level of these subgroups is also reported.

CACO Candidate Performance – Three-year Fail Rates

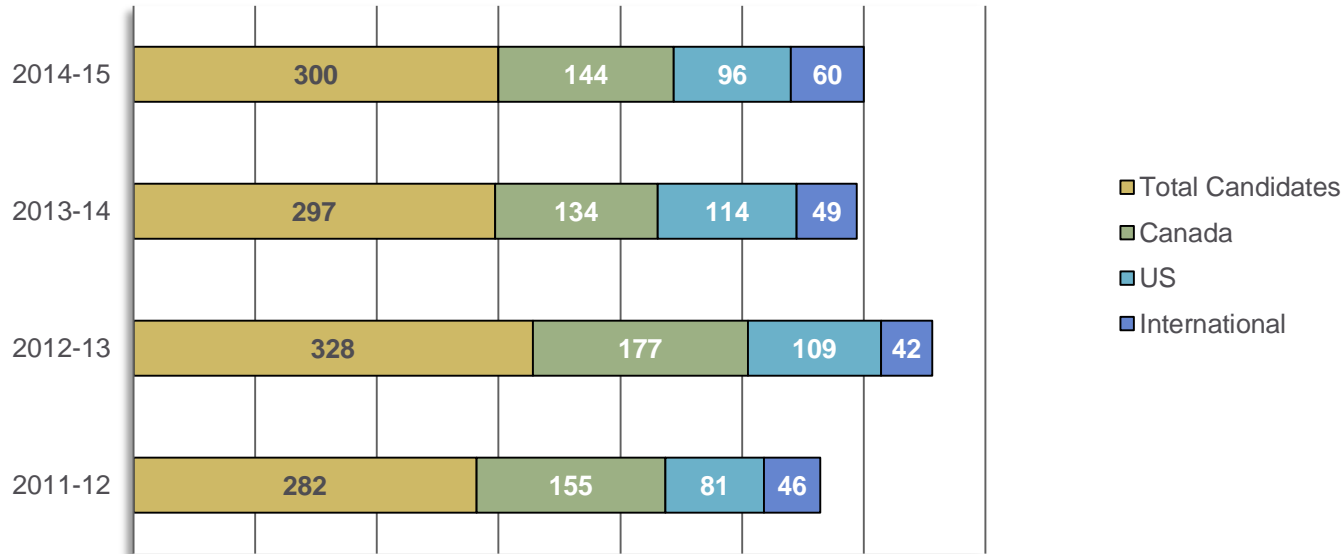


“We now have a comprehensive and defensible competency profile upon which the CACO exam can be adjusted.”

— P.D. Padfield, OD

The reporting period is October 1 to September 30 for the past three examination years, starting 2012-13. Over time this chart will evolve into a rolling five-year trend of CACO fail rates. This chart begins in 2012-13 because exam performance in 2011-12 included the old CSAO.

CACO Candidates – Four-year Trend



The reporting period is October 1 to September 30 for the past four examination years, starting 2011-12 when the CACO and reporting timeline changed to reflect the assessment cycle (October to September). Over time this chart will evolve into a rolling five-year trend of candidate numbers. Note - Total Candidates does not include candidates who took the CACO written-only.

“It’s impressive to see the amount of work put into the new communication skills stations, from the development process to implementation....”

— A. Lavendier, OD

Understanding CACO Components — Prior to April 2015

Component	Assesses	Competency assessed through...	To pass candidate must...
Ocular Therapeutics	<ul style="list-style-type: none"> • General Microbiology • General Immunology • General Pharmacology • Ocular Pharmacology • Ocular Disease/Trauma 	A multiple-choice written exam based on 120 stand-alone test items.	Meet or exceed the minimum level of performance as determined by members of the profession using the Angoff cut-score setting method .
Synthesis	<ul style="list-style-type: none"> • Refractive conditions of the eye and their management • Accommodative conditions of the eye and vision system and their treatment and management • Oculomotor conditions of the eye and vision system and their treatment and management • Sensory–integrative conditions of the Eye and vision system and their treatment and management: • Ocular conditions • Systemic disease and its treatment and management 	A multiple-choice written exam based on 62 comprehensive cases with four test items per case.	
Clinical Skills prior to April 2015	<ul style="list-style-type: none"> • Skills and techniques in interviewing and assessing refractive accommodative conditions • Skills and techniques in assessing oculomotor and sensory-integrative functions • Skills and techniques in assessing ocular and systemic disease • Skills and techniques in assessing ophthalmic appliances 	Four, 45-minute performance-based stations.	

Understanding CACO Components — As of April 2015

Component	Assesses	Competency assessed through...	To pass candidate must...
Ocular Therapeutics	<ul style="list-style-type: none"> General Microbiology General Immunology General Pharmacology Ocular Pharmacology Ocular Disease/Trauma 	A multiple-choice written exam based on 120 stand-alone test items.	<p>Meet or exceed the minimum level of performance as determined by members of the profession using the Angoff cut-score setting method.</p>
Synthesis	<ul style="list-style-type: none"> Refractive conditions of the eye and their management Accommodative conditions of the eye and vision system and their treatment and management Oculomotor conditions of the eye and vision system and their treatment and management Sensory–integrative conditions of the Eye and vision system and their treatment and management: Ocular conditions Systemic disease and its treatment and management 	A multiple-choice written exam based on 62 comprehensive cases with four test items per case.	
Clinical Skills as of April 2015	Clinical Skills <ol style="list-style-type: none"> Visual Function Physical Examination Optometric Treatments 	Three, 45-minute performance-based clinical skills stations.	
	Communication Skills <ol style="list-style-type: none"> Case History Communicating a Diagnosis Communicating a Treatment Plan 	Three, 10-minute performance based stations.	

“Our new Communication Skills “OSCE” stations create a testing environment that places an important focus on patient-doctor interaction as part of the overall competency to practice.”

— C. Grewal, OD

Exam Reliability by Component – 2014-15

Component	Administration October 2014		Administration May 2015	
	Alpha	K ² (Livingston's Coefficient Kappa)	Alpha	K ² (Livingston's Coefficient Kappa)
Ocular Therapeutics	.76	.92	.74	.92
Synthesis	.84	.96	.86	.96
Interviewing and Assessing Refractive and Accommodative Conditions	.80	.83	.91	.92
Assessing Oculomotor and Sensory – Integrative Functions	.87	.94	.28**	.45**
Assessing Oculomotor and Systemic Disease	.76	.84	.90	.91
Assessing Ophthalmic Appliances	.77	.87	.93	.94

* Reliability coefficients for the exam with Skills 1-4. For May 2015, the candidates were reassessment only.

**Low alpha and Kappa due to having only four candidates

The Livingston coefficients in this table meet and exceed the generally expected level of .80 which demonstrates the reliability of our test measures.

Find out more about interpreting the numbers [here](#).

Exam Reliability by Component – 2014-15

Component	Administration April 2015		Administration May 2015	
	Alpha	K ² (Livingston's Coefficient Kappa)	Alpha	K ² (Livingston's Coefficient Kappa)
Ocular Therapeutics	N/A	N/A	.74	.92
Synthesis	N/A	N/A	.86	.96
Skills #1: Visual Function and Case History	.72	.92	.75	.93
Skills #2: Physical Examination and Communicating a Diagnosis	.70	.93	.83	.93
Skills #3: Optometric Treatments and Communicating a Treatment Plan	.60	.92	.74	.92

* Reliability coefficients for the exam with Skills 1-3.

The Livingston coefficients in this table meet and exceed the generally expected level of .80 which demonstrates the reliability of our test measures.

Find out more about interpreting the numbers [here](#).

Item Analysis and Scoring Changes – 2014-15

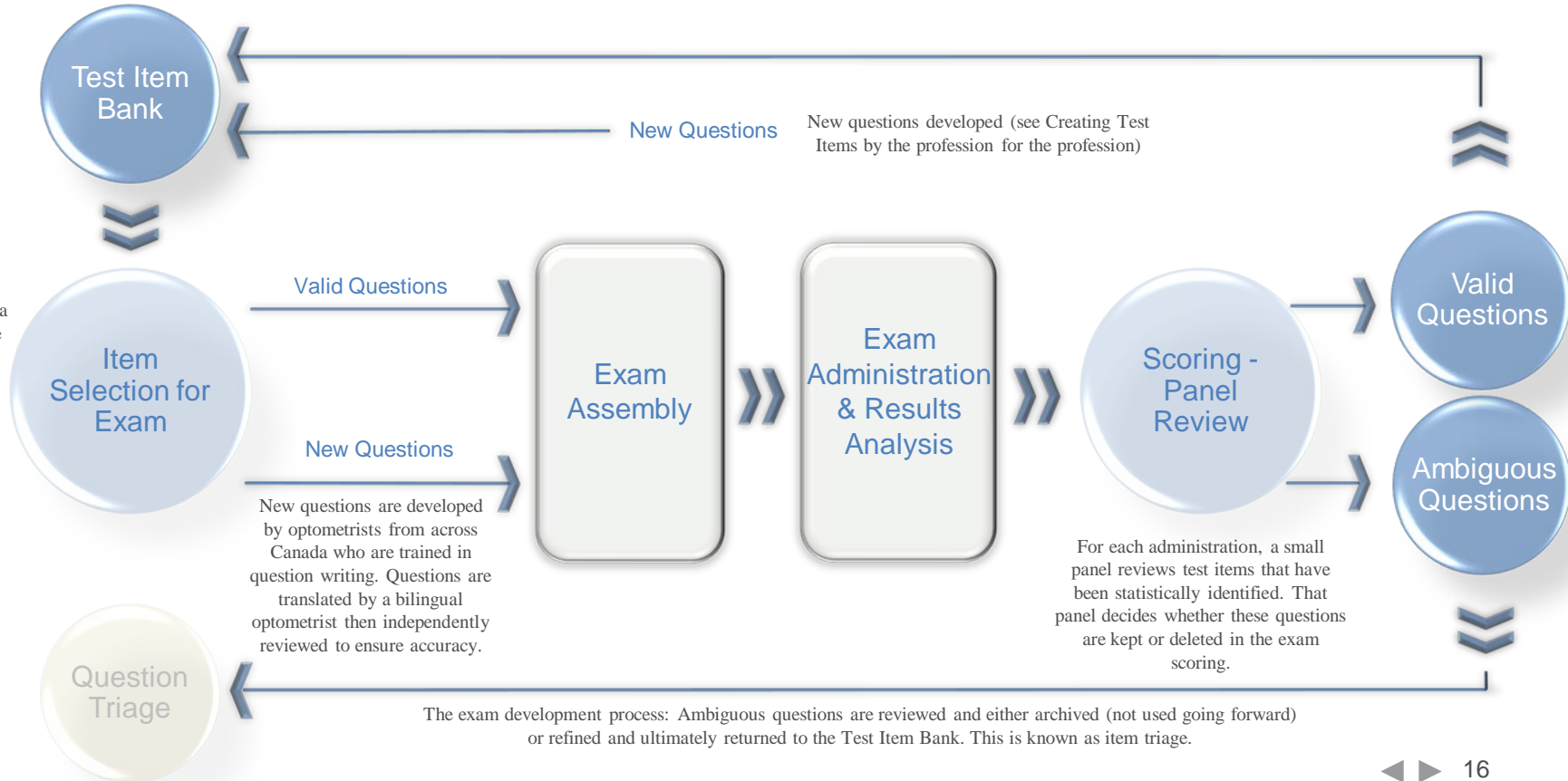
Component	Items Deleted from Scoring	Reason for Change
Ocular Therapeutics	October 2014 - Five of 120 items or 4.2% May 2015 - Four of 120 items or 3.3%	Items are deleted if they fail to meet psychometric criteria. This may include items that have performance levels within acceptable difficulty levels or items failing to discriminate positively.
Synthesis	October 2014 - Seven of 248 items or 2.8% May 2015 - Seven of 248 items or 2.8%	
Clinical Skills	All items performed at the appropriate level and were included in scoring.	

Following each exam administration, CEO-ECO analyses items to ensure they perform in the anticipated manner.

Learn more about the process [here](#).

Exam Development Process: Choosing and Using Test Items

Items included in a written CACO are based on the decisions of practicing optometrists.



Exam Development Process: Creating Test Items

The content of the CACO is based on an exam blueprint. We create new items for the written exam. To create these items, our writers draw from content specifications in the CACO blueprint.

CACO Blueprint

The CACO blueprint provides the foundation of the written and skills components of the CACO.

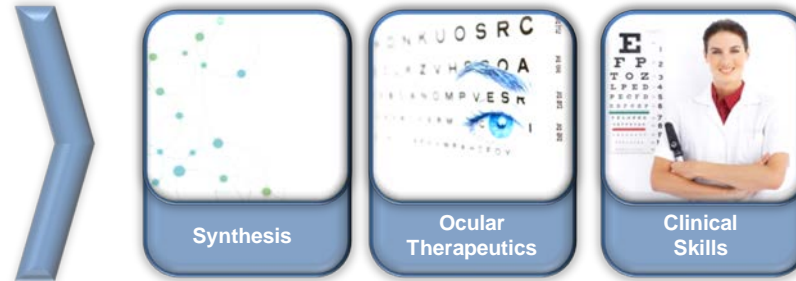
Written components

- Synthesis
- Ocular Therapeutics

Clinical skills components

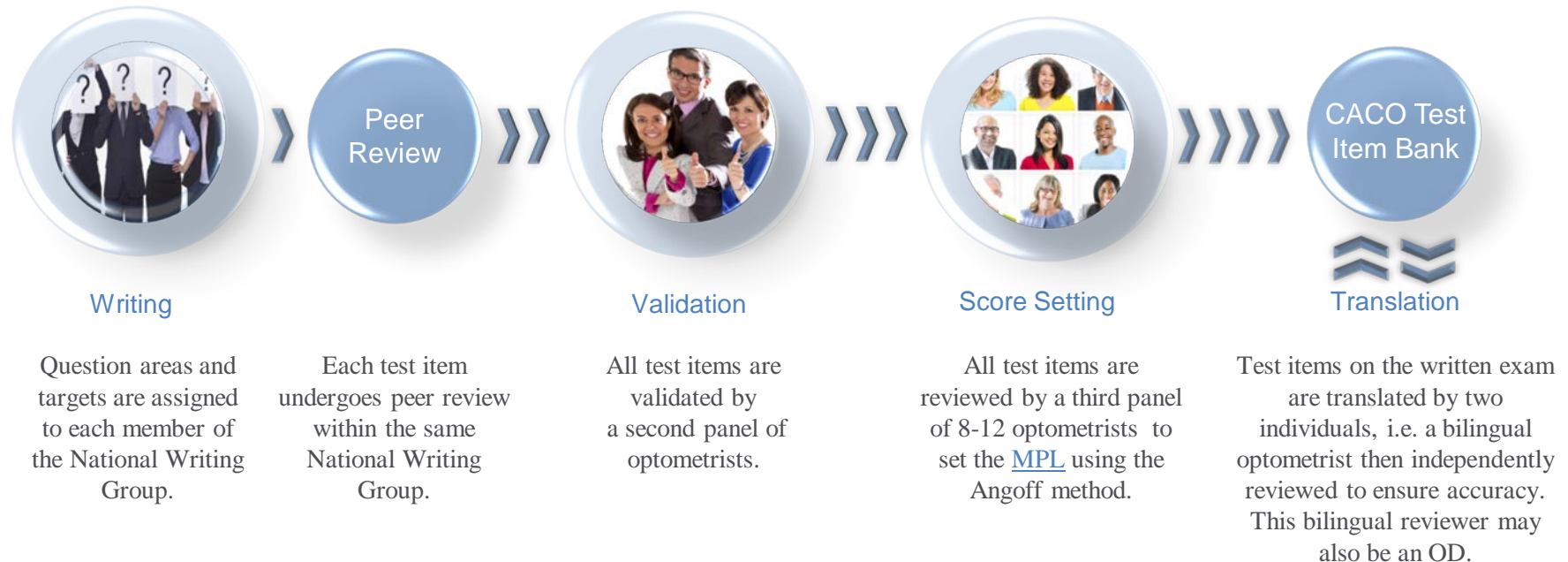
- Clinical skill stations

CACO Exam Question Areas



Exam Development Process: Creating Test Items by the Profession for the Profession

The CACO process follows best-practice in exam development methodology and exam content is grounded in professional practice. All optometrists undergo training to develop technical and judgement skills that ensure optometrists become subject matter experts in a particular area of the exam. Different optometrists work in each stage of exam development.



By the Profession for the Profession

Qualifications and requirements

Members of the profession volunteer or respond to recruitment invitations to help develop and deliver our exams. These optometrists:

- have been in practice five or more years;
- are registered in good standing with a provincial optometry regulatory body in Canada; and
- meet CEO-ECO's conflict of interest guidelines.



Conflict of interest guidelines exclude optometrists who participate in other optometry exams, exam preparatory courses or optometry degree/bridging programs. Optometrists related to an individual enrolled in a program are prohibited from participating in CACO development. Our volunteer application form along with conflict of interest and confidentiality agreements ask optometrists to disclose their other connexions. We use this information to identify the best path for professional involvement that works for them and CEO-ECO.

Trained for success

All optometrists undergo training to develop technical and judgement skills in a specific area of assessment that supplement their professional expertise. This process helps ensure valid exam content and assessments.

Continuing education

Optometrists who volunteer their time and expertise earn hours that can count towards the continuing education requirements of their respective regulatory bodies. CEO-ECO provides a letter confirming an optometrist's participation after each organized exam event.

“It is satisfying to be able to use your experience (both academic and clinical) to give back to the profession.

”

— *P.D. Padfield, OD*



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Canadian Assessment of Competence in Optometry

Summary Report APPENDICES

Definitions

Angoff cut-score setting method: Is an industry standard in determining the passing score for any licensure (registration) exam. To set the pass score, eight to 12 subject matter experts predict how many minimally competent candidates will respond correctly to a test item. The estimates for each item from all the subject matter experts are averaged, then tallied to yield the cut score or pass score for the examination. Return to the [*Understanding CACO Components.*](#)

OSCE: Objectively Structured Clinical Examination. Return to the [*Message from our CEO.*](#)

Total Pass Rate and Total Fail Rate: The total pass rate amalgamates Canadian, US and internationally-educated candidate performance. It is the total number of candidates who took the exam this year and who passed. It is calculated by dividing the number of candidates — first, second and third attempt — who completed and passed the CACO (all components) by the total number of candidates who attempted. For regulatory bodies, the Total Pass Rate can be interpreted as the number of candidates who have met the examination requirement for registration/licensure.

The **Total Fail Rate** amalgamates Canadian, US and internationally-educated candidate performance. It is the total number of candidates who took the exam this year and who failed. For regulatory bodies, the Total Fail Rate can be interpreted as the number of candidates who have not met the examination requirement for licensure/registration. Return to the [*2014-15 Administrations Scorecard.*](#)

Candidate Definitions

Candidate: CACO eligible candidates:

1. have graduated from an Accreditation Council on Optometric Education or ACOE-accredited optometry program; or
2. have completed an optometry bridging program through the IOBP or the EOUM, if they are internationally-educated; or
3. have been practicing as optometrists in Canada or the U.S. For example a Canadian OD educated and practicing in the U.S. who wants to move back to Canada; or
4. have successfully completed the evaluating exam and been approved to take the CACO.

CEO-ECO adheres to the CACO Eligibility and Registration Policies on its website to verify eligibility for each CACO applicant.

Canada: Candidates who have graduated from an accredited Canadian school of optometry.

US: Candidates who have graduated from an accredited U.S. school of optometry.

International: Candidates who have completed a Canadian bridging program at the International Optometric Bridging Program (IOBP) or were approved to take the CACO by the Quebec Order following bridging education at the L'École d'optométrie de l'Université de Montréal (EOUM) [...More](#)

Click [here](#) to return to the 2014-15 Administrations Scorecard.

Candidate Definitions

First-attempt Candidate: Candidates who complete the CACO (written and skills components) in an assessment cycle — October 1 to September 30. Candidates taking the CACO the first time may attempt the written before the skills but cannot reassess failed components until completing the entire CACO. An individual who has been approved as re-eligible to challenge the CACO under the CERP policy is also considered a First-attempt candidate.

Second-attempt Candidate: Candidates who complete CACO component(s) that they failed during their first attempt.

Third-attempt Candidate: Candidates who complete CACO component(s) they failed during their second attempt.

Click [here](#) to return to the 2014-15 Administrations Scorecard.

Definitions

MPL: Minimum Performance Level based solely on performance criteria. CACO candidates attempt to meet or exceed the minimum standard of performance rather than competing against other candidates. The MPL ensures the standard for minimally acceptable competence is consistent despite variation in question content between administrations.

This method also removes predetermined passing rates for the administration of the CACO. If the candidate population has a high level of performance on the assessment, the failure rate will be low. If the performance level of the candidate population on the assessment is low, the failure rate will be higher. The MPL is established in advance of a CACO administration by a panel of practising optometrists. See the definition of [Angoff cut-score setting](#). Return to [Creating Test Items by the Profession for the Profession](#).

Interpreting the numbers

What the numbers tell us

The traditional Cronbach's alpha is reported. However, as the CACO is better characterized as a criterion-referenced test, the Livingston's reliability coefficient is also provided. A closer examination of the Livingston's coefficients across all components (with the exception of the small sample in Skills 2 in May 2015) for the three administrations indicates that they are strong, exceeding .80 – a threshold for high-stake exams. This strong reliability indicator contributes to the validity of CACO test measures.

Click [here](#) to return to Exam Reliability by Component — 2014-15

Understanding item analysis and scoring

Following each exam administration, CEO-ECO performs item analysis. This is a process to examine how each item performed on the exam which helps ensure only valid items are kept for scoring. During this process, a panel of optometrists reviews items that do not meet established criteria and determines whether to include them in scoring.

When items may be deleted from scoring

Test items are subject to review and possibly deleted from scoring if:

- less than 20% of the total group successfully answer; or
- the item fails to discriminate positively.

How we make that final decision

A panel of practicing optometrists, in consultation with a psychometrician, decides whether to delete the item. Items that are deleted are removed from scoring for all candidates thereby ensuring that reported results are both valid and fair. An item deleted from the scoring of written components is generally made for the entire group of candidates (the whole group level).

It is rare for skills station items to be deleted at the group level. It is more likely for adjustments to occur at the individual candidate level where there was evidence that some factor, such as equipment failure, negatively affected candidate performance.

[Click here to return to Item Analysis and Scoring Changes — 2014-15](#)
