

CEO

Canadian Examiners in Optometry



ECO

Examineurs Canadiens en Optométrie

Canadian Assessment of Competence in Optometry

# Summary Report 2013-14



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



MESSAGE FROM  
OUR C.E.O.



2013-14 ADMINISTRATION RESULTS



ASSESSING COMPETENCY  
WITH CONFIDENCE





## A Message from our C.E.O.

During the 2013-14 assessment cycle, CEO-ECO advanced our goals and met our commitments. We successfully:

- delivered five CACO administrations — in whole or in part;
- provided candidate reports within eight weeks of each exam for all administrations; and
- completed or launched projects that will allow us to deliver the best defensible competency assessment now and in the future.

I'd like to share with you the CACO results for 2013-14 and highlight key accomplishments and new projects that support our strategic goals. This report was prepared in consultation with our psychometrician, Dr. Anthony Marini, Martek Assessments Ltd.

### CACO administrations

In this administration cycle, CEO-ECO delivered three CACO administrations at the 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 2013 (written only) in Montreal;
- October 2013 in Waterloo;
- April 2014 (clinical skills only) in Waterloo; and
- May 2014 in Waterloo and in Montreal.

“CEO-ECO relies on the generosity of  
dedicated optometrists from across Canada.”



TAMI HYNES  
Chief Executive Officer



## 2013-14 CACO performance highlights

**More candidates challenging the CACO:** CEO-ECO saw an 11.6% increase in the number of candidates challenging the CACO this year. Of the 306 total candidates, we also saw more first-attempt candidates, at 272. This represents a 13% increase from last year. This cycle, we also noted 107 candidates were educated at schools in the United States — up from 75 or about a 43% increase. The [CACO Candidates –Three year Trend](#) highlights total candidate volume.

**Pass rates:** The [CACO 2013-14 Administrations Scorecard](#) provides pass rates by candidate subgroup and by attempt. This year, the total pass rate was 81.5% down from 87.2% the previous year. The difference is notable but not statistically significant. The total pass rate amalgamates Canadian, US and internationally-educated candidate performance and reflects the diversity of the subgroups.

Likewise, we saw 272 first-attempt candidates challenging the CACO this year. The first-attempt pass rate was lower at 77.2% (210/272) versus 85.4% last year. Pass rates for first attempt candidates by Canadian and US-educated subgroups decreased by approximately 10% each to 85.9% and 78.5% respectively. At the same time, first attempt pass rates for internationally-educated candidates rose to 43.2%, up from 41%.

**Performance patterns consistent since 1996:** [CACO Candidate Performance —Two-year Pass Rate](#) and [Two-year Fail Rate](#) charts illustrate that Canadian-educated candidates exhibit stronger performance, followed by US-educated candidates. This pattern has been consistent since 1996. Likewise, the pattern is present in the performance data of other licensure examinations. Given the CACO is grounded in Canadian practice and reflects the preparation of Canadian-educated candidates, the pattern is to be expected.

**“More candidates challenged the CACO.”**



TAMI HYNES  
Chief Executive Officer



## By the profession, for the profession

CEO-ECO relies on the generosity of dedicated optometrists from across Canada. We are fortunate to work with such a committed group of professionals. Without them, it would be impossible to deliver a relevant and cost-effective assessment of competency in optometry. Thank you to everyone, including our many subject matter experts, who played a role in the development and delivery of this year's exams. The CACO will benefit from their work during the 2014-15 assessment cycle and beyond.

## Three changes for CACO 2014-15

With the support of optometrists, we continue to evolve to deliver an entry-to-practice exam that is valid, legally defensible and relevant to optometry practice in Canada.

In line with our strategic goals, CEO-ECO continued to undertake changes to improve oversight, exam integrity, transparency and fairness. We also worked on a new skills exam format and created question items for the 2014-15 assessment cycle. Here are the highlights.

1. **New questions** — 300 new items were written and are ready to be used in our 2014-15 exams (including the PLA). New CACO items included 80 ocular therapeutics items and 120 synthesis items.
2. **New communication skills** — we continued to create items in anticipation of a redesign Clinical Skills Exam. Starting in spring 2015, three 10-minute communication [OSCE](#) stations will test candidate skills. You can learn more about the [New Skills Exam](#) format on our website.
3. **Updated exam administration policies** — increase clarity, transparency and fairness. Our new, [updated exam policies](#) including updated [Procedures and Rules](#) are online to support upcoming CACO administrations.

“With the support of optometrists,  
we continue to evolve ...”



TAMI HYNES  
Chief Executive Officer



## New competency profile and exam blueprint underway

In May 2014, CEO-ECO recruited a team of optometrists and launched a key project that will benefit CEO-ECO and the profession. Our experienced competency consultant, who has worked with other professions in Canada, trained the optometrists in writing competency statements.

The team is now at work creating a new competency profile — the foundation for a new CACO blueprint. This winter, a Canada-wide survey will invite registered optometrists from across the country to validate the proposed competencies. Then, in April, stakeholders will attend a consultative review of the new profile. By June, we expect to have a new CACO blueprint and to begin our exam design and administration review.

In 2015, we will also review our eligibility and retake policy. The review will identify issues and concerns. Our goal: ensure our policies are clear, transparent and fair and that they support CACO validity and defensibility.

Tami Hynes  
Chief Executive Officer



“By June, we expect to have a new CACO blueprint...”

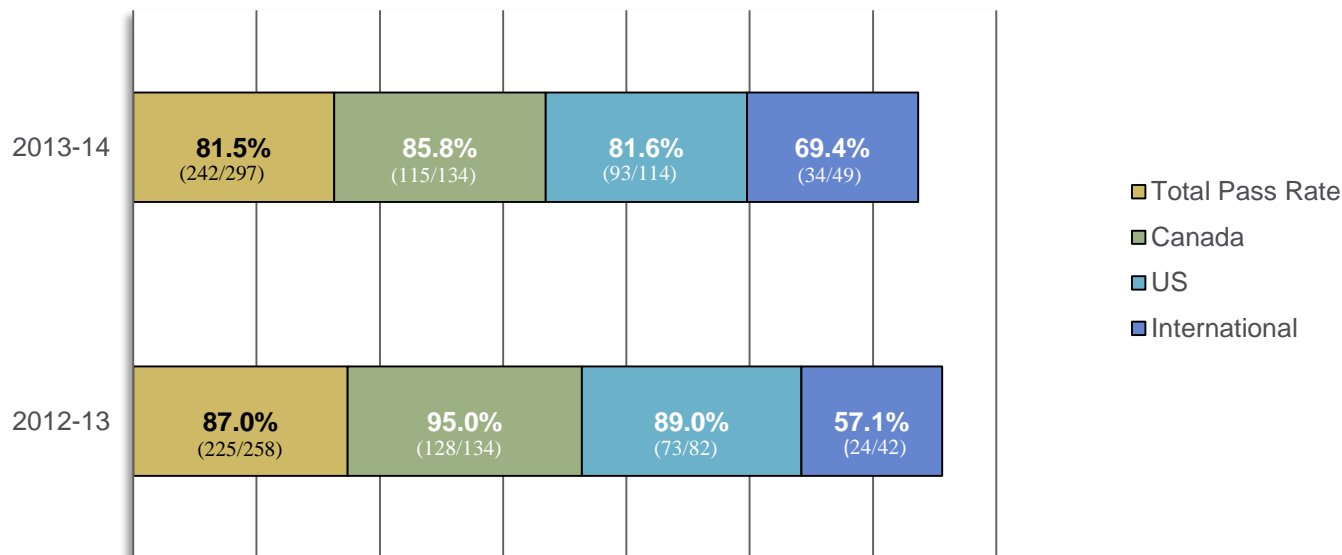


## CACO Administrations Scorecard — 2013-14

	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	85.9	80	100	85.8	78.5	100	100	81.6	43.2	73.7	36.4	69.4	81.5
Candidate Totals	110/128	4/5	1/1	115/134	84/107	8/8	1/1	93/ 114	16/37	14/19	4/11	34/39	242/297

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

## CACO Candidate Performance – Two-year Pass Rates

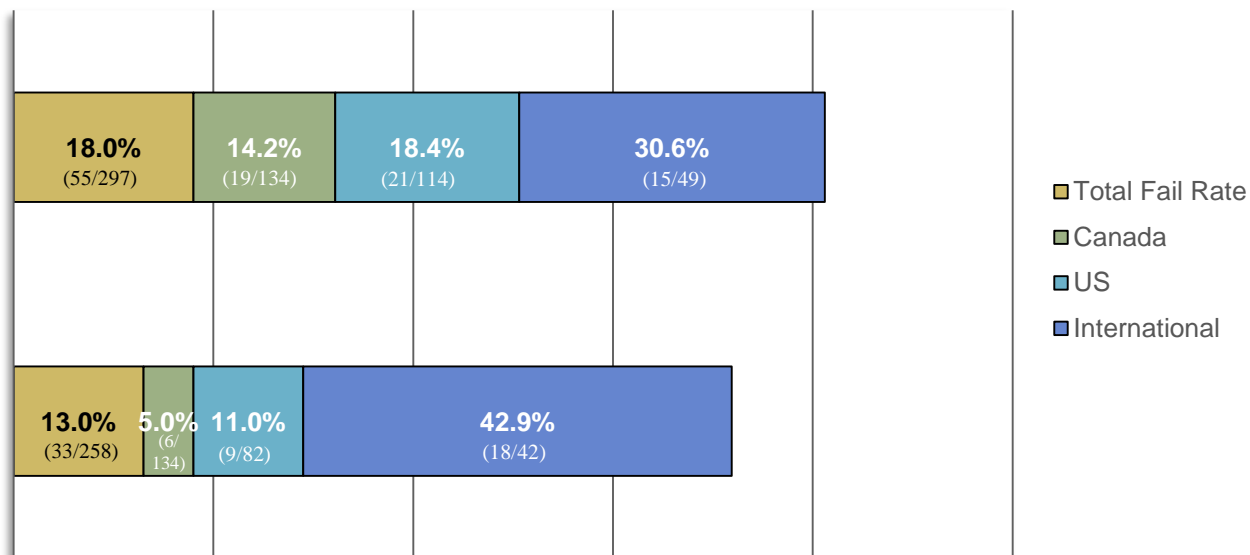


Performance across our candidate groups is consistent with results found in other licensing exams. This includes lower pass rates within the international candidate group.

*The reporting period is October 1 to September 30 for the past two 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.*

## CACO Candidate Performance – Two-year Fail Rates



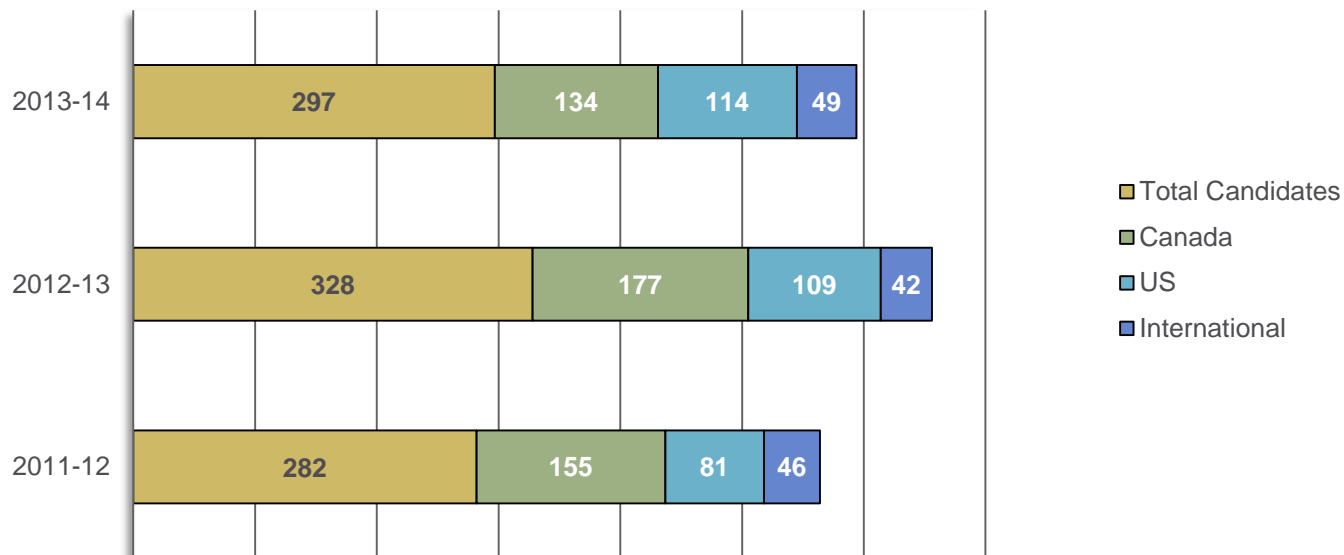
The reporting period is October 1 to September 30 for the past three examination years, starting 2011-12. Over time this chart will evolve into a rolling five-year trend of CACO fail rates. This chart begins in 2012-13 because exam performance in 2011-12 included the old CSAO.

“...CEO-ECO implements the most important responsibility of a self-regulating profession: that of assessing the competency of those seeking a license to practice.”  
— D. Champagne, OD





## CACO Candidates – Three-year Trend



*The reporting period is October 1 to September 30 for the past three 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.*



## Understanding CACO Components

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

“...I get to work as part of a team helping to shape the future of our profession.”  
— G. Moloney, OD



## Exam Reliability by Component — 2013-14

Component	Administration October 2013		Administration April 2014		Administration May 2014	
	Alpha	K <sup>2</sup> (Livingston's Coefficient Kappa)	Alpha	K <sup>2</sup> (Livingston's Coefficient Kappa)	Alpha	K <sup>2</sup> (Livingston's Coefficient Kappa)
Ocular Therapeutics	.81	<b>.89</b>	N/A	<b>N/A</b>	.79	<b>.91</b>
Synthesis	.87	<b>.94</b>	N/A	<b>N/A</b>	.84	<b>.93</b>
Interviewing and Assessing Refractive and Accommodative Conditions	.83	<b>.85</b>	.55	<b>.88</b>	.60	<b>.84</b>
Assessing Oculomotor and Sensory – Integrative Functions	.74	<b>.84</b>	.79	<b>.95</b>	.73	<b>.95</b>
Assessing Oculomotor and Systemic Disease	.86	<b>.92</b>	.59	<b>.91</b>	.70	<b>.92</b>
Assessing Ophthalmic Appliances	.78	<b>.88</b>	.78	<b>.88</b>	.66	<b>.93</b>

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](#).



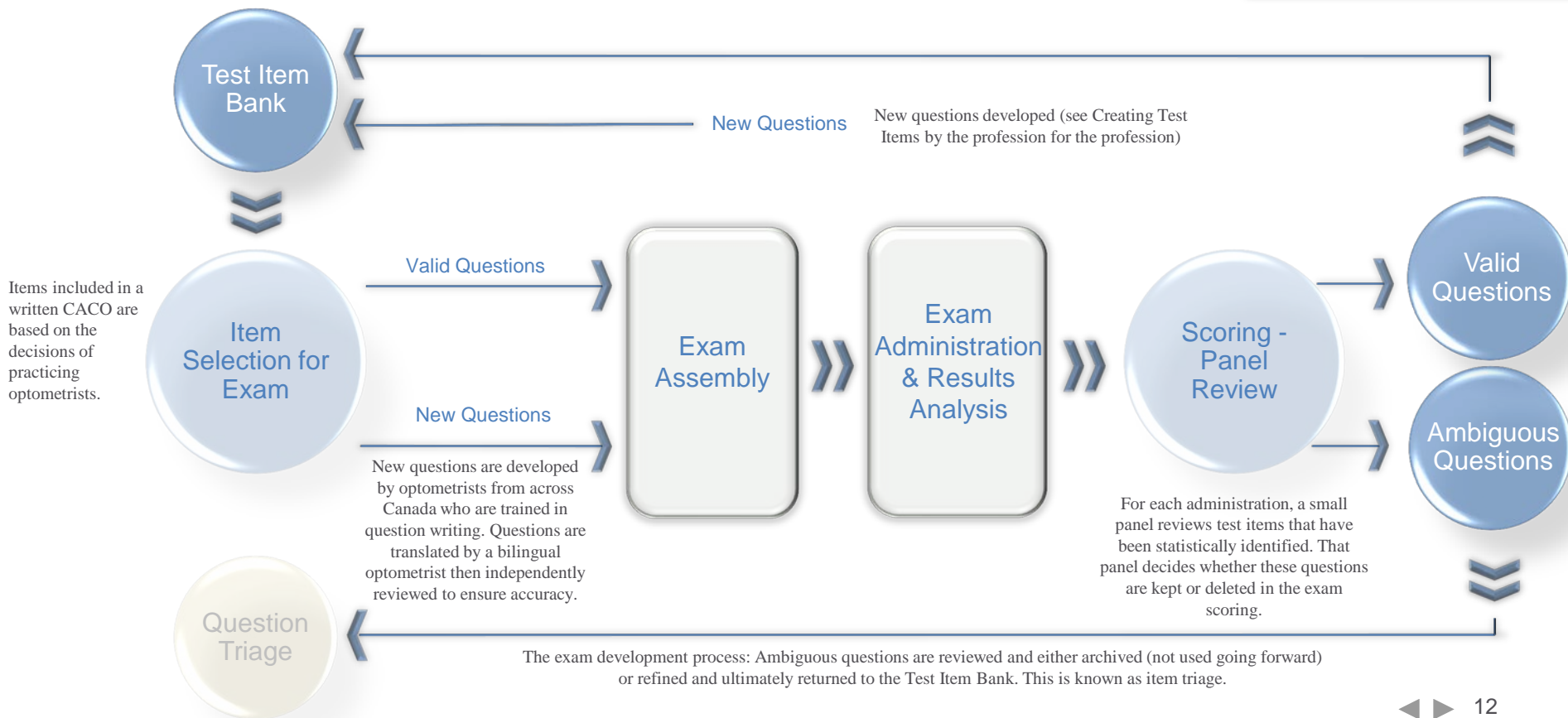
## Item Analysis and Scoring Changes – 2013-14

Component	Items Deleted from Scoring	Reason for Change
Ocular Therapeutics	October: 6 of 120 items or 5% May: 3 of 120 items or 2.5%	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: 11 of 248 items or 4.4% May: 7 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





## 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.

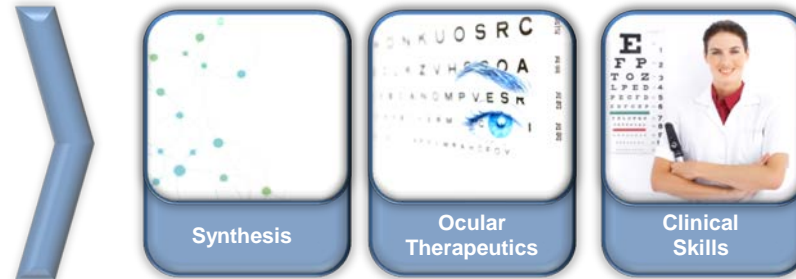
#### Written components

- Synthesis
- Ocular Therapeutics

#### Clinical skills components

- Clinical skill stations one to four

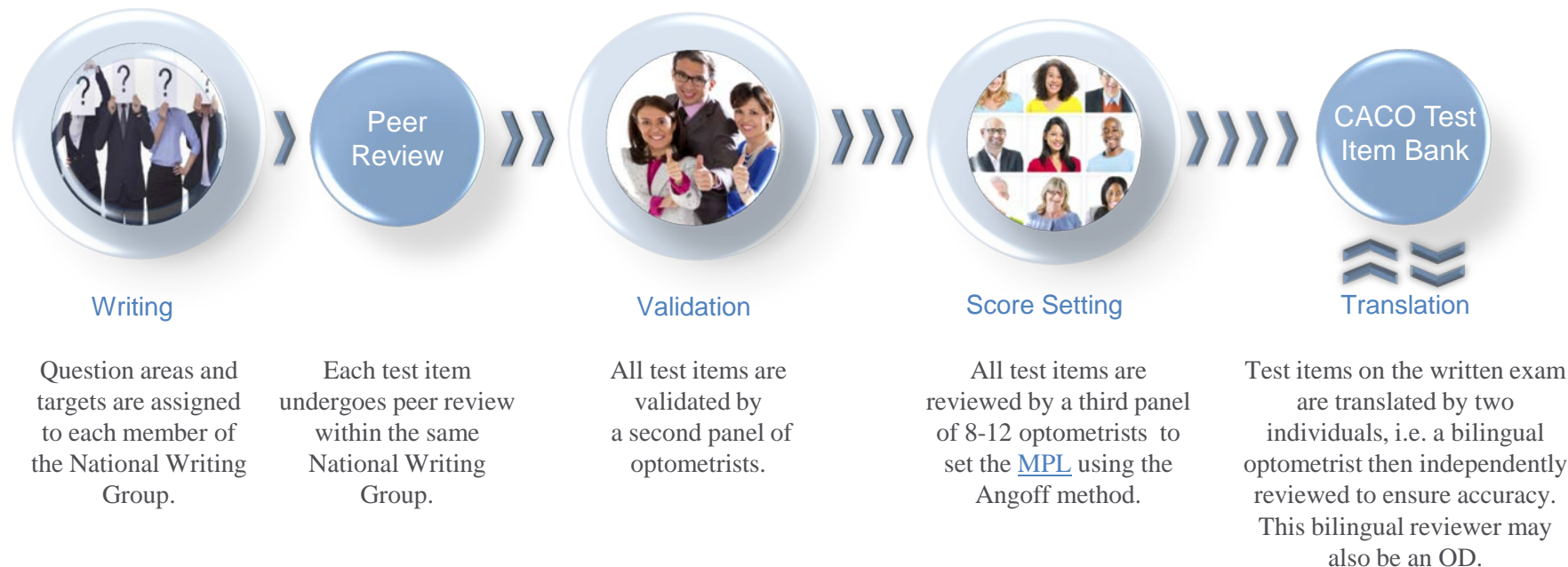
### CACO Exam Question Areas





## 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.

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“...I can learn from watching how [new grads] have been trained to do the same things I've been doing for 40 years.”

— S. Mintz, OD



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# 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 Exam. 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 licensure/registration.

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 [\*2013-14 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.

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 2013-14 Administrations Scorecard.*

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## 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 2013-14 Administrations Scorecard.

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## 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 high. 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 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 — 2013-14*

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## 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 — 2013-14](#)

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