



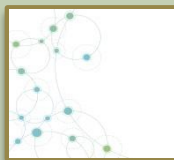
CEO | ECO

Canadian Assessment of Competence in Optometry

# Summary Report 2015-16



**OUR VISION:** Be the recognized leader in competence assessments for optometry in Canada.



MESSAGE FROM  
OUR C.E.O.



2015-16 ADMINISTRATION RESULTS



ASSESSING COMPETENCY  
WITH CONFIDENCE



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

At CEO-ECO it is our mission to assess competency in the practice of optometry in Canada. The board, our staff and our optometrist volunteers are resolute in their drive to deliver the best defensible competency assessment. In 2015, the board of directors approved the development of a new optometry entry-to-practice exam grounded in the National Competency Profile.

Our efforts over the past couple of years culminate in this new examination that evolves how we assess competence in optometry. This new exam, called the CEO-ECO Written and OSCE (Objective Structured Clinical Exam) will replace the Canadian Assessment of Competence in Optometry (CACO) in the spring of 2017.

It has been a busy year for everyone. In the 2015-16 administration cycle CEO-ECO:

- Managed five CACO administrations — in whole or in part. See [2015-16 Administration Results](#) for performance highlights
- Developed the new exam using the new blueprint based on CEO-ECO's [National Competency Profile for Entry-level Optometry](#), and
- Updated our examination policies to transition to the CEO-ECO Written and OSCE in 2017.

**“Canada’s first profession-validated  
national competency profile for entry-level optometry.”**



TAMI HYNES  
Chief Executive Officer

## New Entry-to-Practice examination for the profession

The purpose of the exam is to test whether candidates can demonstrate the entry-level competencies the profession has determined are required to enter the practice of optometry in Canada.

Key features of the new exam:

- It is based on a competency profile validated by optometrists from across the country.
- The OSCE cases emphasize clinical reasoning and professional judgement.
- Trained standardized patients (SPs), in set scenarios ensure a consistent candidate experience as well as the validity, reliability and fairness of test results.

The new exam is a testament to the many optometrists who gave their time and experience to develop it as well the competency profile and blueprint. To learn more about our National Competency Profile for Entry-level Optometry, the Blueprint and features of the new exam, see [The Evolution of the Entry-to-Practice Exam](#) on page four.

CEO-ECO will offer the new Written exam and OSCE twice a year — spring and fall, starting 2017.

## Volunteer optometrists key to developing the new exam

This year, volunteer optometrists administered the CACO, while preparing to implement the new exam in 2017. Practising optometrists like Dr. C. Chan from Ontario and Dr. L. Hladun from Alberta are two of the many optometrists who volunteered with CEO-ECO to develop the new exam. You can learn more about Dr. Chan's and Dr. Hladun's experience in [Future Forward: Evolving the Entry-to-Practice Exam](#) on page five.

**“The new exam is a testament to the many optometrists who gave their time to develop it...”**

“My experience in score setting ranks as one of the best continuing education experiences of my long career. It was stimulating, collegial and educational.”  
— A. Palmer, OD

Learn more about volunteer qualifications, training and continuing education credits [here](#).

## Updated policies and OSCE pilot pave the way for spring 2017

CEO-ECO has undertaken initiatives to support the launch of the new Written exam and OSCE, such as:

- Published a new board-approved eligibility policy for candidates transitioning from the CACO to the new examination. The new [Eligibility & Reassessment – Transitional Candidates](#) is available on CEO-ECO.org
- Posted documents for candidates explaining the new exam design, what to expect and how to prepare. Postings included:
  - [Overview of Blueprint](#), [Blueprint](#) and [Q&A](#)
  - [Sample Question Written Case](#) and [Sample Question OSCE Interactive Station](#)
- Planned a pilot to test administering the proposed OSCE.

The pilot allows us to administer the OSCE on a small scale and test the proposed processes in a no-stakes situation. In most respects it will mimic a typical OSCE administration. This is an opportunity to test:

- Assessor training
- Candidate movements between stations, and
- Staff jobs

The pilot's qualitative feedback from participants along with quantitative performance data will contribute to a smooth administration of the new exam in the spring 2017.



Tami Hynes  
Chief Executive Officer

**“A pilot allows us to administer the OSCE on a small scale and test the proposed processes in a no-stakes situation.”**

Getting involved in the exam as a volunteer lets us use our vast experience in real-life clinical settings to advance the future of our profession.

— D. Monea, OD

## The Evolution of the Entry-to-Practice Exam

Coming spring 2017: the new CEO-ECO Written Exam and OSCE (Objective Structured Clinic Exam). The new exam tests whether candidates can demonstrate the entry-level competencies the profession has determined are required to enter the practice of optometry in Canada.



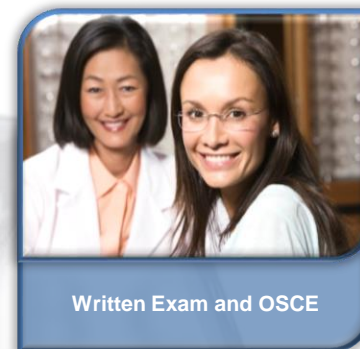
Sets the 92 competencies, grouped into nine areas of practice, optometrists require for safe, effective and ethical practise when entering the profession. The competency profile was:

- Developed by a group of expert optometrists in 2014
- Validated through a national survey of optometrists in 2015
- Approved by CEO-ECO's board of directors in 2015



Ensures all candidates have equal opportunity to demonstrate they have the competencies necessary to practise optometry safely and effectively. The blueprint

- Outlines the exam structure
- Identifies 87 indicators the written exam or OSCE stations may test
- Includes the weighting for each area of practice



Tests if a candidate can demonstrate the competencies the profession has determined are required to enter the practice of optometry.

- Written Exam – one-day, paper exam comprised of 62 cases
- OSCE – 3.5-hour practical exam comprised of 16 stations that emphasize clinical reasoning and professional judgement. Employs Standardized Patients

## Future Forward: Evolving the Entry-to-Practice Exam

How often can it be said you shaped the future of your profession? That is a good question for optometrists C. Chan<sup>1</sup> and L. Hladun<sup>1</sup>. As volunteer optometrists with CEO-ECO, they have been involved in the development of the new CEO-ECO Written and OSCE (Objective Structured Clinical Exam) launching in spring 2017.

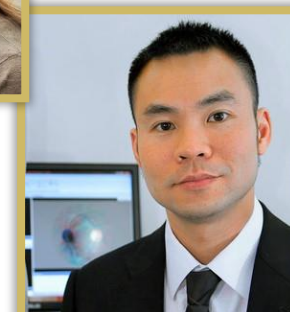
“Earlier in the year, I wrote cases based on the new blueprint for the OSCE,” says Chan who has been in practice in Toronto for the past nine years. “I’m now writing test items for the new written examination.”

“It’s important for Canadian optometrists to be a part of this exam,” says Hladun who has her practice in Alberta. “We know what it is like to be a practising optometrist. We can make the exam realistic for candidates. And we can ensure new optometrists are able to work at an entry level — diagnose patients and communicate effectively with them.”

Hladun has been involved in setting the pass score for the exam, a process that determines the minimum performance level expected of a candidate. “It’s amazing how much work goes into ensuring the exam properly assesses competency,” she says. “Actors now work as standardized patients. We’ve worked together to validate that OSCE stations allot sufficient time for candidates to complete assigned tasks.”



Shaping the future;  
volunteer  
optometrists  
L. Hladun (left)  
and C. Chan  
(below).



**“It’s important for Canadian optometrists  
to be a part of this exam,” says Hladun.**

<sup>1</sup> To ensure exam security, CEO-ECO restricts volunteer optometrists from promoting their CEO-ECO affiliation. In accordance with this policy, CEO-ECO has withheld the full names of volunteer optometrists appearing in this article.

### Assessing key optometric skills ensures public protection

“We set the pass scores for everything – from completing a chart to performing an eye exam. The process confirms candidates have the skill-level required to enter the profession. It’s about ensuring the public receives proper care.” says Chan, who also travels regularly to under-served communities in Ontario to see patients.

“Key optometric skills are assessed during the exam,” says Hladun. “For example, how to deal with a challenging patient. Communication is critical; patient complaints are often based on communication misunderstandings.”

### Ensuring a fair and balanced experience for candidates

Volunteer optometrists like Hladun and Chan play a vital role. They ensure optometrists entering the profession meet the expectations for entry-level practice and patient care in Canada. “I like being involved in making the entry-to-practice exam as fair and balanced an experience as possible for candidates,” says Chan.

For Hladun, volunteering is an important part of building your community – locally or professionally. “It’s fulfilling being a part of a new process and making it the best it can be,” she says. “I am excited to see the administration of the new exam.”

“The process confirms candidates have the skill-level required to enter the profession.” says Chan.

Check out what it means to volunteer with CEO-ECO, read ***By the Profession for the Profession*** on page 19.

Learn more about volunteer qualifications, training and continuing education credits.



## 2015-16 CACO Administration Results

CEO-ECO completed five administrations in 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 de l'université de Montréal. CACO administrations were held:

- October 2015 in Waterloo,
- October 2015 (written only) in Montreal,
- April 2016 (clinical skills only) in Waterloo, and
- May 2016 in Waterloo and in Montreal.

### 2015-16 CACO performance highlights

**Candidates challenging the CACO:** CEO-ECO saw 273 candidates this year compared to 300 candidates last year. We also saw fewer first attempt candidates, at 241 compared to 257 last year. This represents a 6.2% decrease from last year. In general, U.S. candidate numbers were comparable and the decrease in candidates reflects fewer international and Canadian candidates. The [CACO Candidates – Five year Trend](#) highlights total candidate volume.

**Pass rates up marginally from last year:** The CACO 2015-2016 Administrations Scorecard provides pass rates by candidate subgroup and by attempt. This year, the total pass rate was 86.8%, up 3.1% from 83.7% in the previous year. This increase in part reflects the stronger performance of international candidates.

The total pass rate amalgamates Canadian, US and internationally-educated candidate performance and reflects the diversity of the subgroups.



Likewise, we saw 241 first attempt candidates challenging the CACO this year. The first attempt pass rate was comparable at 82.2% versus 77.4% last year. Pass rates for first attempt candidates increased for the Canadian subgroup by almost 1% to 89.7% and remained comparable for the U.S. subgroup with a slight decrease of .5% to 79.5%.

At the same time, first attempt pass rates for internationally-educated candidates increased by 15% to 62.2% up from 47.2%. This is a significant increase and reflects a stronger-performing international subgroup. In addition to the change in performance, there were fewer first-attempt international candidates than in the previous year.

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

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The total pass rate amalgamates Canadian, US and internationally-educated candidate performance and reflects the diversity of the subgroups.

“The first attempt pass rates for internationally-educated candidates increased 15%”

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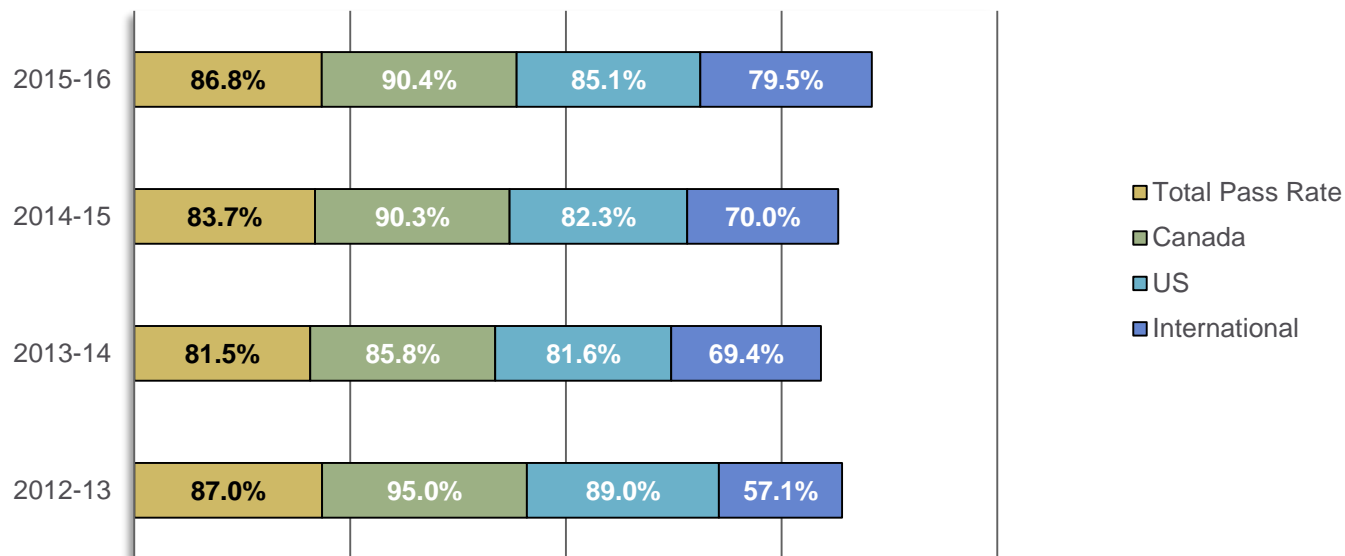
## CACO Administrations Scorecard — 2015-16

	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	89.7%	100%	N/A	90.4%	79.5%	94.1%	100%	85.1%	62.2%	78.6%	100%	79.5%	86.8%
Candidate Totals	113/126	9/9	0	122/135	62/78	16/17	2/2	80/94	23/37	11/14	1/1	35/44	237/273

*For the purposes of interpretation, note that the results of this report are a reflection of the status of a candidate at the end of this year's administration cycle (fall and spring). Therefore the report reflects a "candidate lifecycle", however a candidate's lifecycle can extend beyond one administration cycle (year). Third attempt candidates are always from a prior administration cycle. This year, a small number of candidates undertook two administrations. Second attempts within the reporting cycle typically involve international candidates, particularly if international candidates first attempt in the fall. Some candidates are counted as both first attempt and second attempt. For example, of the 14 international candidates who took a second attempt, 7 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 – Four-year Pass Rates

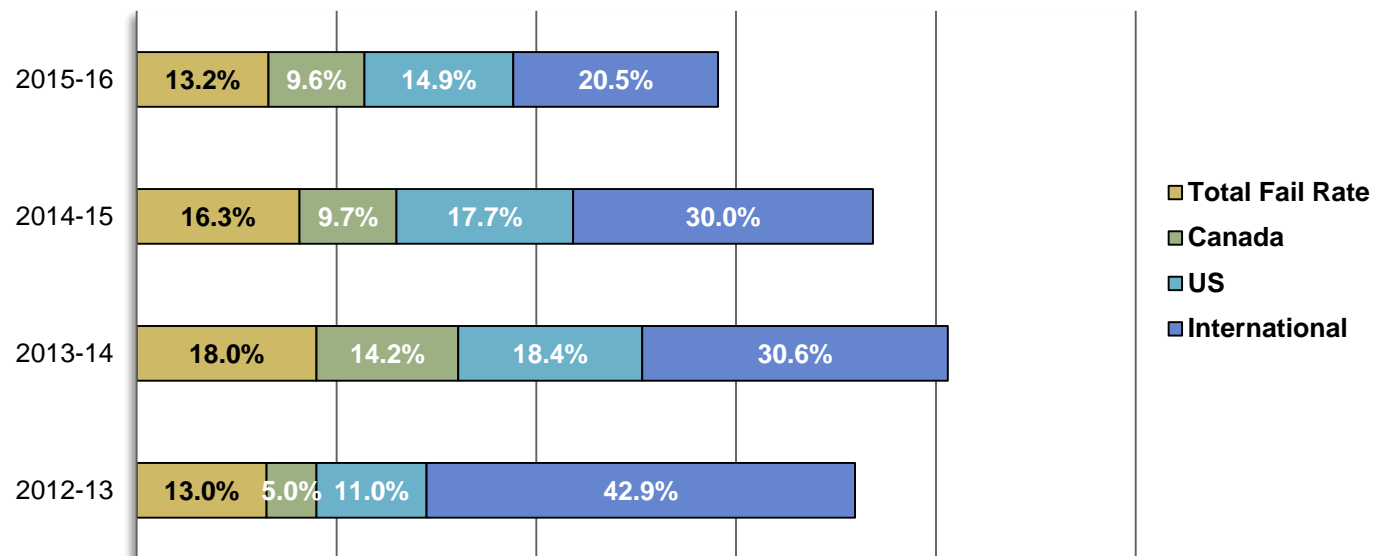


“I help ensure the exam reflects the clinical experience optometrists face every day in their examination rooms.”  
— T. Wilbee, OD

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

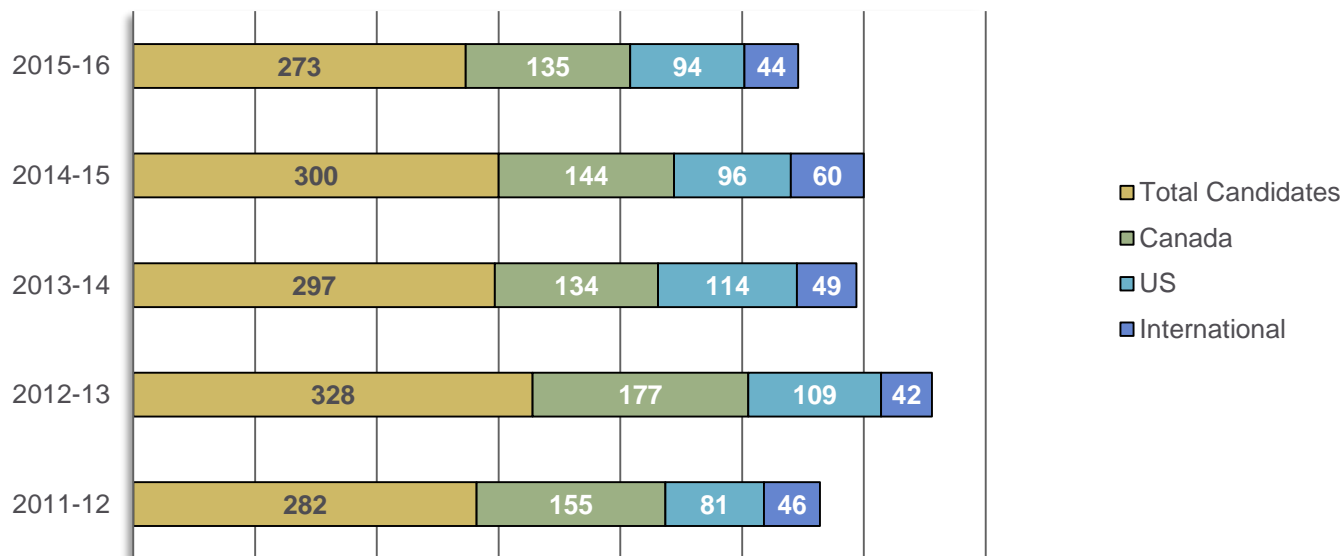
## CACO Candidate Performance – Four-year Fail Rates



“My involvement in [OSCE development] improved my professional knowledge.”  
— T. McNab, OD

*The reporting period is October 1 to September 30 for the past four 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 – Five-year Candidate Numbers Trend



*The reporting period is October 1 to September 30 for the past five examination years, starting 2011-12 when the CACO and reporting timeline changed to reflect the assessment cycle (October to September). Note - Total Candidates does not include candidates who took the CACO written-only.*

“My volunteer experience helped me appreciate where the emphasis is in licensure in Canada. That learning makes me a better mentor and employer to younger colleagues.”  
— D. Monea, OD

## 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.	<p>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>.</p>
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 as of April 2015	<b>Clinical Skills</b> <ol style="list-style-type: none"> <li>Visual Function</li> <li>Physical Examination</li> <li>Optometric Treatments</li> </ol>	Three, 45-minute performance-based clinical skills stations.	
	<b>Communication Skills</b> <ol style="list-style-type: none"> <li>Case History</li> <li>Communicating a Diagnosis</li> <li>Communicating a Treatment Plan</li> </ol>	Three, 10-minute performance based stations.	

“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 – 2015-16

Component	Administration October 2015		Administration April 2016		Administration May 2016	
	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	.70	<b>.91</b>	N/A	N/A	.79	<b>.91</b>
Synthesis	.81	<b>.95</b>	N/A	N/A	.89	<b>.96</b>
<b>Skills #1:</b> Visual Function and Case History	.78	<b>.98</b>	.68	<b>.98</b>	.86	<b>.98</b>
<b>Skills #2:</b> Physical Examination and Communicating a Diagnosis	.72	<b>.98</b>	.49	<b>.98</b>	.77	<b>.99</b>
<b>Skills #3:</b> Optometric Treatments and Communicating a Treatment Plan	.61	<b>.98</b>	.57	<b>.97</b>	.69	<b>.98</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**.



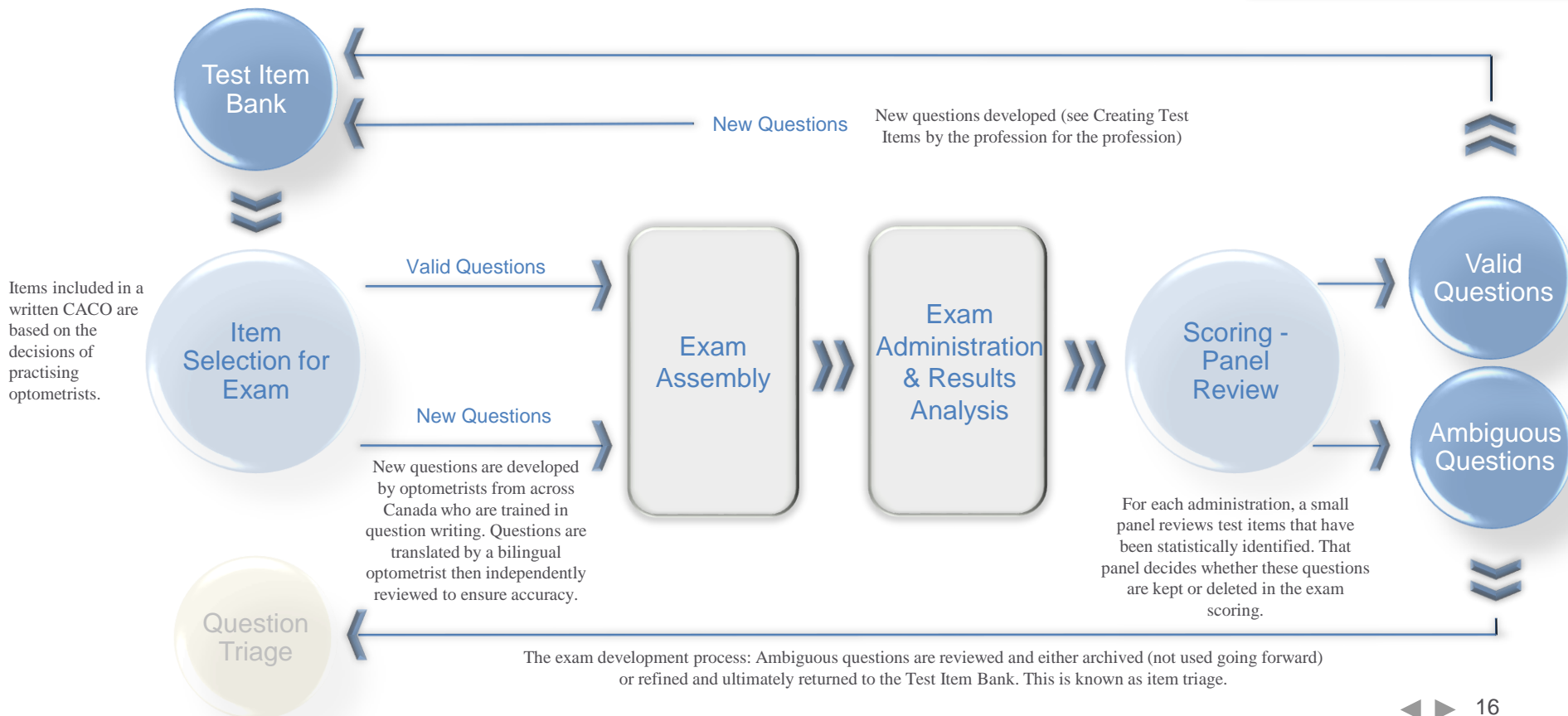
## Item Analysis and Scoring Changes – 2015-16

Component	Items Deleted from Scoring	Reason for Change
Ocular Therapeutics	October 2015- Three of 120 items or 2.5% May 2016 - Three 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 2015 - Eleven of 248 items or 4.4% May 2015 – Six of 248 items or 2.4%	
Clinical Skills	April 2016- Skills One: Three of 131 items or 2.3% May 2016 – 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.

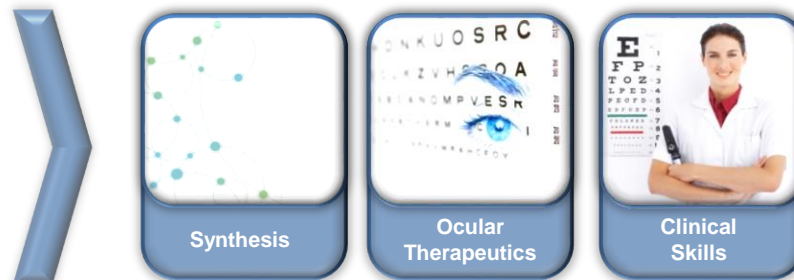
#### Written components

- Synthesis
- Ocular Therapeutics

#### Clinical skills components

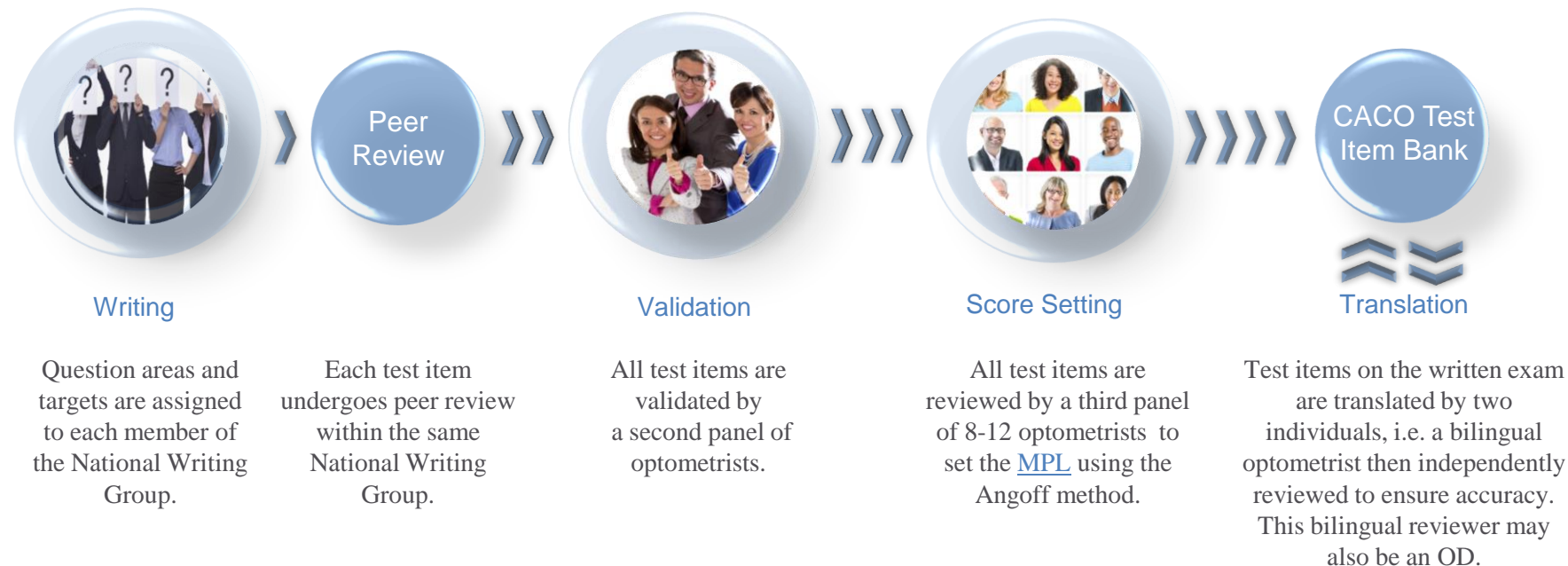
- Clinical skill stations

### 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 and the actual and credit hours earned in each event. See [Volunteer with CEO](#).

“My experience in standard setting ranks as one of the best continuing education experiences of my long career. It was stimulating, collegial and educational.”  
— A. Palmer, OD



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Canadian Assessment of Competence in Optometry

# Summary Report APPENDICES

## General 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:** stands for Objective Structured Clinical Examination. It is a form of practical examination that provides candidates with a consistent exam experience, and provides assessors with objective behavioural criteria for scoring candidate performances. Return to OSCEs are used by many Canadian licensing bodies (regulators) as one criterion for entry to practice. Examples include medicine, pharmacy, physiotherapy, dental hygiene and nurse practitioners. Return to the [Message from our C.E.O.](#)

**Standardized patient:** is a person who has been trained to present the signs and symptoms of a condition, and respond to candidate questions, statements and actions consistently.



## General Definitions

**Total Pass Rate and 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 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 [Administrations Scorecard](#).

## General Definitions

**MPL:** stands for Minimum Performance Level and is 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](#).

## 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 practising as optometrists in Canada or the U.S. For example a Canadian OD educated and practising 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 Administrations Scorecard.*

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## Candidate Definitions

**First-attempt Candidate:** Candidates who complete the CACO (written and skills components) for the first time in an assessment cycle — October 1 to September 30. Eligible candidates taking the CACO the first time may attempt the written before the skills.

**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 Administrations Scorecard.

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## Interpreting the numbers

### What the numbers tell us

The traditional Cronbach's alpha is reported. This coefficient is suitable for norm-referenced tests common in educational testing and which compare exam takers to each other.

The Livingston's reliability coefficient is also reported. This coefficient is suitable for a criterion-referenced test such as the CACO which measures how a candidate's knowledge and skills compared to a defined body of content.

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

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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 practising 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](#)

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