



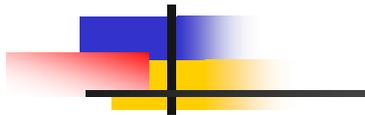
Summary Report

Canadian Standard Assessment in Optometry (CSAO) and Canadian Assessment of Competence in Optometry (CACO)

2011 Administrations

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Summary Report for Spring 2011CSAO Administrations

Purpose

This report provides aggregate candidate performance and psychometric analysis of the assessment tools related to the Canadian Standard Assessment in Optometry (CSAO) and Canadian Assessment of Competence in Optometry (CACO). The report includes data for new CSAO and CACO candidates and reassessment CSAO candidates in 2011.

Overview

For the Spring 2011 CSAO administrations, a total of 192 candidates participated. Of this number, 165 (85.9%) were new¹ candidates 17 (8.9%) represented reassessment candidates and 10 (5.2%) candidates selected the option to write the written exams only, returning to sit the four clinical sessions at a later administration. The performance of these 10 candidates will not be reported in this summary but will be presented when these individuals complete the 4 clinical sessions of the exam. The new candidate pool for Spring 2011 represents a 10% increase in participation compared to Spring 2010.

Table 1 reports the new candidate pool (n=165) by Professional School for the Spring 2011 administrations. A breakdown of candidates across the categories Canadian, USA and International schools results in a total of 102 (61.8%) Canadian educated, 40 (24.3%) American educated and 23 (13.9%) International educated candidates. While the participation rate in 2011 for American educated candidates is up 7.5% in comparison to 2010, it is still significantly lower than the 2009 Spring administrations when this group made up 50.5% of new candidates. The international candidates' participation dropped from 17.4% of the Spring candidate pool in 2010 to 13.9% for the Spring 2011 administrations.

¹ New candidates (new candidates = .1) initiated the CSAO for the first time, however of these 165, 17 took the clinical only and concluded the full CSAO in spring 2011.

Table 1: Distribution of New Candidates Across Schools

School of Optometry	Candidates	Percent
U.of Waterloo	74	44.9
U.of Montreal	28	17.0
Pennsylvania College	7	4.2
SUNY	2	1.2
Nova Southeastern University	6	3.7
Illinois College	8	4.9
New England College	14	8.5
Indiana University	1	.6
Michigan College	1	.6
Inst. Am. Puerto Rico	1	.6
University of Aston, England	3	1.8
College of Optometrists of United Kingdom	2	1.2
University of Manchester	2	1.2
City University, London	3	1.8
Glasgow Caledonian University	1	.6
Royal College London	1	.6
LaSalle University, Colombia	2	1.2
Central University of Venezuela	1	.6
All India Institute of Med Science	1	.6
Tehran University, Iran	1	.6
Shahid Beheshti (Iran)	1	.6
Abia State University, Nigeria	1	.6
ICO Faculty of Medicine, Egypt	1	.6
Al-Azhar University, Cairo	1	.6
Tishreen University, Syrian Arab Republic	1	.6
Tianjin Medical University Hospital, China	1	.6
Total	165	100

Structure of the CSAO Components

The CSAO is comprised of 7 components: 3 Written Components and 4 Skill Stations

Written components include: 1) Optometric Knowledge (380 items)

- Human Biology
- Systemic Conditions
- Human and Visual Development & Aging
- Ocular Visual Biology
- Ocular Disease/Trauma
- Radiation, Light & Optics
- Vision
- Public Health and Safety



- 2) Ocular Therapeutics (120 items)
 - General Microbiology, Immunology, Pharmacology
 - Ocular Pharmacology
 - Ocular Disease/Trauma: treatment, management and progress.

- 3) Clinical Judgment (100 items) – 25 Clinical Cases
 - Oculomotor
 - Sensory-integrative
 - Systemic disease
 - Refractive Error
 - Ocular Disease
 - Accommodation

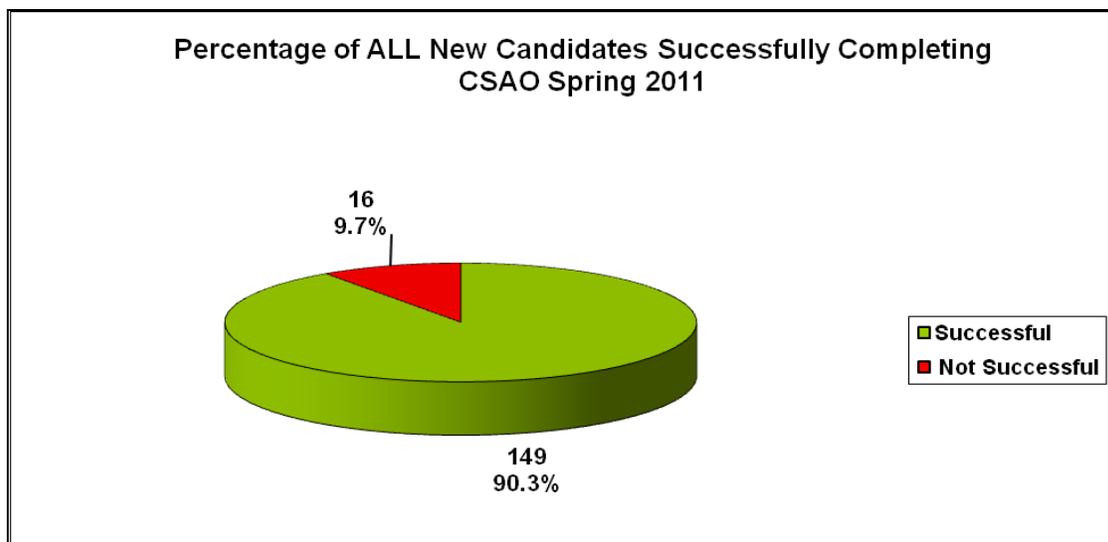
Skills Stations include: (45 minutes each)

- 1) Skills and Techniques in Interviewing and Assessing Refractive and Accommodative Conditions
- 2) Skills and Techniques in Assessing Oculomotor and Sensory-Integrative Functions
- 3) Skills and Techniques in Assessing Oculomotor and Systemic Disease
- 4) Skills and Techniques in Assessing Ophthalmic Appliances

Summary of Candidate Performance

Figure 1 represents the overall pass rate for all new 165 Spring 2011 candidates. In order for a performance to be deemed as a “Pass” the candidate is required to be successful in all 7 CSAO components. The Spring 2011 pass rate of 90.3% is somewhat higher than the Spring 2010 pass rate of 84.6%.

Figure 1

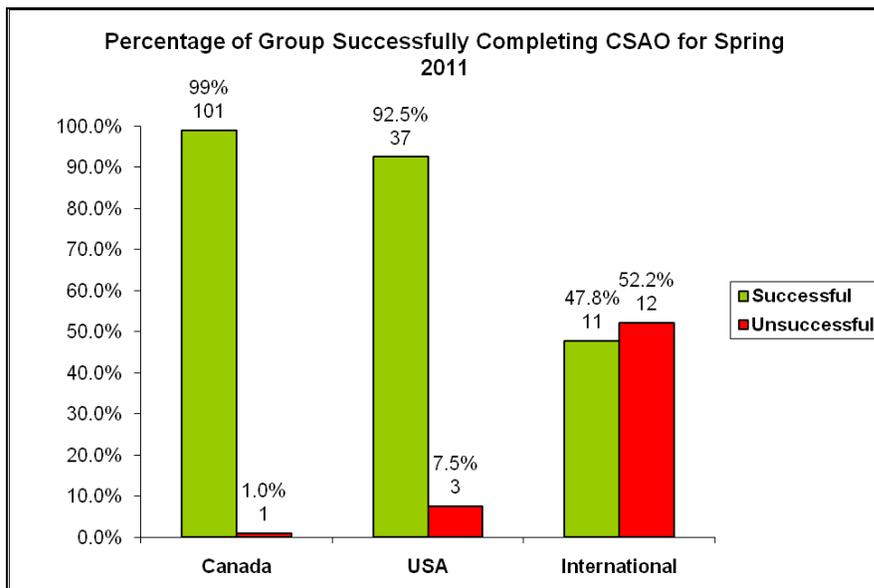


Performance by Group

Figure 2 below, breaks down the overall pass rate for 149 new candidates by the following groupings: Canada (n=102), USA (n=40), and International (n=23) educated. Results for the three groups were consistent with previous administrations with Canadian candidates having overall the strongest performance.

The pass rate for the 2011 Spring administrations for the International cohort is 47.8% which is somewhat higher than the 2010 Spring administration (38.5%). Eleven of 23 candidates (47.8%) successfully passed all 7 components of the CSAO. An additional 4 candidates were successful on 6 of the 7 components.

Figure 2

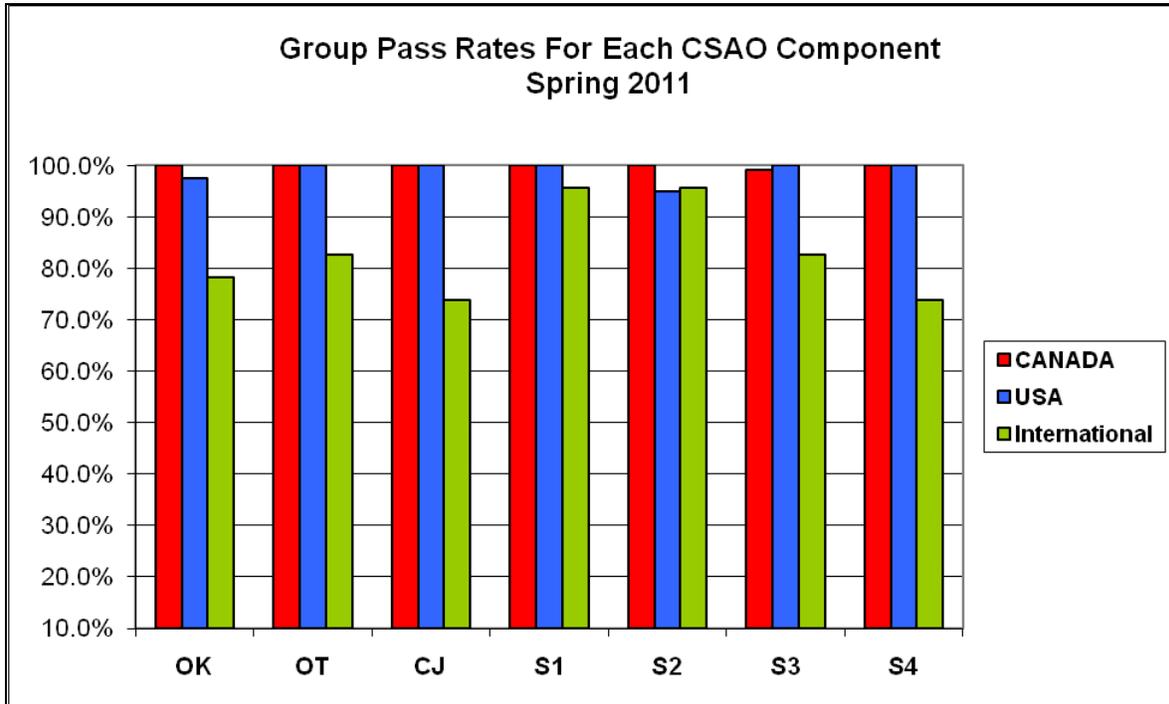


Group Pass Rate by Component

Figure 3 compares the performance of the Canadian, American and International candidates for each of the CSAO components. As the data indicates, the overall performance of the Canadian educated candidates is stronger however both Canadian and American educated candidates performed well across all components. International candidates encountered relative difficulties in Optometric Knowledge and Clinical Judgment of the written components and Skills Session 3 (Assessing Oculomotor and Systemic Disease) and Session 4 (Assessing Ophthalmic Appliances). This pattern of performance for International candidates is consistent with the Spring 2010 administration.



Figure 3



Item Analysis and Psychometric Properties of the Examination Components

A complete item analysis was undertaken for both Spring 2011 administrations. For the April examinations, 11 items in Optometric Knowledge, 3 items in Ocular Therapeutics and 1 item in Clinical Judgment were deleted. In May, 17 items in Optometric Knowledge, 5 items in Ocular Therapeutics and 5 items in Clinical Judgment were deleted from scoring. Overall, the percentage of the items deleted from scoring across the two sessions was modest (2.3% and 4.5% respectively).

No items were deleted for all candidates for any of the 4 Clinical Skills examinations.

Table 2 reports reliability coefficients for each component for both Spring administrations. The traditional Cronbach's alpha is reported but given that the CSAO examinations are better characterized as criterion-referenced tests, the Livingston's reliability coefficient is also provided. A closer examination of the Livingston's coefficient across all components for both administrations indicates that they are strong and contribute to establishing the validity of these measures.



Table 2: Reliability coefficients for the components of the Spring 2011 CSAO administrations.

April 2011	Alpha	k² (Livingston's Coefficient Kappa)
Optometric Knowledge	.90	.99
Ocular Therapeutics	.74	.98
Clinical Judgment	.71	.96
Skills 1	.60	.90
Skills 2	.72	.95
Skills 3	.78	.95
Skills 4	.73	.93

May 2011	Alpha	k² (Livingston's Coefficient Kappa)
Optometric Knowledge	.94	.99
Ocular Therapeutics	.80	.96
Clinical Judgment	.79	.94
Skills 1	.43	.91
Skills 2	.72	.95
Skills 3	.78	.92
Skills 4	.76	.94

- S1: Skills and Techniques in Interviewing and Assessing Refractive and Accommodative Conditions
- S2: Skills and Techniques in Assessing Oculomotor and Sensory-Integrative Functions
- S3: Skills and Techniques in Assessing Oculomotor and Systemic Disease
- S4: Skills and Techniques in Assessing Ophthalmic Appliances

Performance of Reassessment Candidates

In total, 17 candidates returned for reassessment in the Spring 2011 administrations of the CSAO. Seven candidates were returning for a second attempt, and 10 candidates for a third attempt. Five of the 7 second attempters (71.4%) passed. Of the third attempters, 4 of the 10 (40%) candidates were successful. Overall, 9 of the 17 (52.9%) reassessment candidates successfully completed the CSAO.



Summary Report for Fall 2011 CACO Administration

Background

In the past, the CEO annual examination report has integrated all three administrations (April, May and October) in a single report. However, in the Fall of 2011, the CSAO was replaced by a new exam structure. The new CACO (Canadian Assessment of Competence in Optometry) examination saw the Optometric Knowledge and Clinical Judgment component of the CSAO evolve into the new Synthesis component of the CACO. The Synthesis component, which is a case based multiple-choice exam served to expand the Clinical Judgment exam and include key areas previously assessed by the Optometric Knowledge exam of the CSAO.

With the introduction of the new exam structure for the Fall administration, it was no longer possible to align and integrate the Spring and Fall results for 2011. As a consequence, the results for the Fall administration are reported separately below.

Overview of the CACO Fall 2011 Administration

For the Fall 2011 CACO administration, a total of 127 candidates participated. Of this number, 25 (19.7%) were new (all components) candidates, 86 (67.7%) were new “written only” which includes writing the Ocular Therapeutics and the new Synthesis examination, and 16 (12.6%) represented reassessment candidates. This report will focus on the 25 candidates who completed all 6 components of CACO. The status of the 16 reassessment candidates will also be reported. The results for the 86 candidates, who completed only the written components, will be reported when the candidates complete the 4 remaining Clinical Skills sessions at a subsequent administration.

Table 3 reports the new (all components) candidate pool (N=25) by Professional School for the 2011 Fall administration. A breakdown of new fully completed candidates across the categories Canadian, USA and International schools results in a total of 1 (4.0%) Canadian educated, 6 (24.0%) American educated and 18 (72.0%) Internationally educated participants.

Table 3: Distribution of New Candidates (Completing all 6 CACO components) Across Schools

School	Frequency
University of Montreal	1
Pacific University	1
Illinois College	2
New England College	1
U.of Manchester	1
Cairo University Egypt	1
Int.Am.Puerto Rico	1
City University (London)	2
Shahid Beheshti (Iran)	1
University of Missouri	1
Glasgow University, Scotland	1
University of Auckland	1
University of Johannesburg (South Africa)	1
Calicut Medical College	1
Iran University of Medical Sciences	1
Kasturba Medical College India	1
Labafinejad Medical Center	1
R.N.T. Medical College, India	1
Rand Academic University of Johannesburg	1
Sarojini Naidu Medical College	1
Sun Yat-Sen University	1
UFA Bashkirian State Medical University	1
University of Zulia, Venezuela	1
Total	25

Table 4 reports the new (written only) candidate pool (N=86) by Professional School for the 2011 Fall administrations. A breakdown of candidates across the categories Canadian, USA and International schools results in a total of 61 (70.9%) Canadian educated, 24 (27.9%) American educated and 1(1.2%) International educated candidates.

Table 4: Distribution of New Candidates (completing the 2 written components only of the CACO) Across Schools

School	Number of Candidates	Percent
U.of Waterloo	30	34.9
U.of Montreal	31	36.0
Pennsylvania College	1	1.2
SUNY	3	3.5
Illinois College	3	3.5
Indiana University	3	3.5
New England College	4	4.7
Nova Southeastern University	10	11.6
Saudi Council for Health Specialties, Saudi Arabia	1	1.2
Total	86	100.0

Structure of the CACO Components

The CACO is comprised of 6 components. The 2 written components include Synthesis made up of 62 cases with 4 multiple-choice questions each, Ocular Therapeutics (120 items) and 4 Clinical Skills Stations.

Cases for the Synthesis component focus on:

- 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 disease and trauma and its treatment and management
- Systemic disease and its treatment.

The Ocular Therapeutics exam includes the following areas:

- General microbiology
- General immunology
- General pharmacology
- Ocular pharmacology
- Ocular disease/trauma: treatment, management and progress.



The four 45 minute skills stations require the candidates to perform a number of clinical skills in the following four sessions²:

- Skills and Techniques in Interviewing and Assessing Refractive and Accommodative Conditions
- Skills and Techniques in Assessing Oculomotor and Sensory-Integrative Functions
- Skills and Techniques in Assessing Oculomotor and Systemic Disease
- Skills and Techniques in Assessing Ophthalmic Appliances

Overall Candidate Performance

The overall pass rate for all new (N=25), Fall 2011 candidates was 64%. In order for a performance to be deemed as a “Pass” the candidate is required to be successful in all 6 CACO components. The Fall 2011 pass rate of 64.0% is considerably lower than the pass rates noted in the Spring administrations and is influenced by the small sample size of the examination pool and the virtual absence of Canadian educated candidates who consistently have high passing rates.

Performance by Group

Given the small sample size of the entire candidate pool it is not meaningful to examine pass rates by the typical categories of Canadian, American and Internationally educated. In fact, Canadian educated candidates account for only one candidate, while American educated account for 6 candidates. The largest group for this administration were the international candidates who accounted for 18 of the 25 candidates and who achieved an overall pass rate of 72.2%.

Performance by Component

Table 5 indicates the pass rate for each of the 6 CACO components for the Fall administration. The results are reported for the 25 new candidates who completed all 6 components of the exam process. Given the small candidate pool it is difficult to draw any reliable conclusions regarding the differential performance of candidates across components for the Fall administration. This issue is more reliably addressed in examining the results of the Spring administration above for all components except the new Synthesis examination.

² The first administration of the redesigned clinical component of the CACO will be fall 2012.

Table 5: Pass Percentage for each CACO Component for New candidates (n=25)

Component	Pass Rate (%)
Synthesis	84
Ocular Therapeutics	100
Skill Session 1	92
Skill Session 2	88
Skill Session 3	80
Skill Session 4	92

Item Analysis and Psychometric Properties of the Examination Components

A complete item analysis was undertaken for the Fall 2011 administration. For the Synthesis exam a total of 9 of the 248 items were deleted from scoring while 5 of the Ocular Therapeutics were deleted from scoring. Overall, the percentage of the items deleted from scoring across the two written components was modest (3.6% and 4.2% respectively).

No items were deleted for all candidates for any of the 4 Clinical Skills examinations.

Table 6, reports the reliability coefficients for each component of the Fall Administration. The traditional Cronbach's alpha is reported but given that the CACO examinations are better characterized as criterion-referenced tests, the Livingston's reliability coefficient is also provided. A closer examination of the Livingston's coefficient across all components for the Fall 2011 administration indicates that they are strong and contribute to establishing the validity of the examination process.

Table 6: Reliability coefficients for the components of the Fall 2011 CACO administrations.

October 2011	Alpha	k² (Livingston's Coefficient Kappa)
Synthesis	.84	.96
Ocular Therapeutics	.78	.97
Skills 1	.72	.83
Skills 2	.78	.90
Skills 3	.86	.87
Skills 4	.83	.86

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- S1: Skills and Techniques in Interviewing and Assessing Refractive and Accommodative Conditions
 - S2: Skills and Techniques in Assessing Oculomotor and Sensory-Integrative Functions
 - S3: Skills and Techniques in Assessing Oculomotor and Systemic Disease
 - S4: Skills and Techniques in Assessing Ophthalmic Appliances

Performance of Reassessment Candidates

In total, 16 candidates returned for reassessment in the Fall 2011 administration. Fourteen candidates were returning for a second attempt, and two candidates for a third attempt. Overall, 8(50%) of the 16-reassessment candidates were successful.

Summary for all three 2011 Administrations

Overall the results for the three administrations for 2011 indicate that all components of the CEO examination process worked well with reliability coefficients for all components above the desired values. Moreover, CEO successfully launched the new Synthesis examination during the Fall 2011 administration and is on track to introduce an expanded communication skills section involving standardized patients in the Clinical Skills section of the CACO examination for Fall 2012.