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NATIONAL BOARD OF EXAMINERS IN OPTOMETRY

California Board of Optometry

October 23, 2020

Jill Bryant, OD, MPH, NBEO Executive Director
Brianne Hobbs, OD, NBEO Director of Exam Innovation
Brooke Houck, PhD, NBEO Director of Psychometrics and Research
Bill Rafferty, OD, Task Force Chair and North Carolina Board of Optometry Executive Director

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Restructure Update

California Board of Optometry
October 23, 2020
Brianne Hobbs, OD, FAAO
Director of Exam Innovation

Patient Encounters and Performance Skills (PEPS)

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Purpose of PEPS Exam

To assess the ability of candidates to enter the independent practice of optometry by evaluating essential skills and the application of knowledge to patient care

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Goals of the PEPS Exam

01

Protect the health of the public (safety and welfare)

02

Align with changes in optometry

03

Meet needs of licensing board by ensuring competency of candidates

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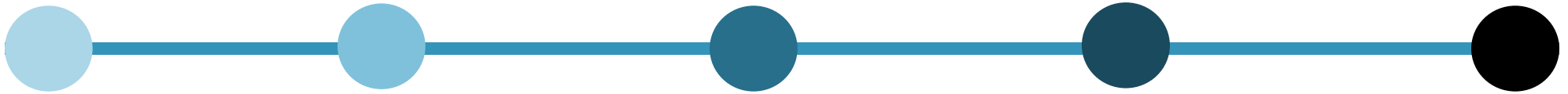
Timeline

Spring 2019

Spring 2020



Research

Strategic partnerships

Stakeholder survey

Creation of Task Force

Job Task Analysis

Development of blueprint and model

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Comparison Chart of Testing Specifications in Doctoral Level Medical Professions

Osteopathic Medicine	Medical Doctors	Podiatry	Pharmacy	Chiropractic Medicine	Physical Therapy	Veterinary Medicine	Dentistry	Optometry
D.O. degree COMLEX I-III Residency	M.D degree USMLE I-III Residency	D.P.M degree AMPLE I-III Residency	PharmD. NAPLEX Jurisprudence exam	D.C. degree NBCE I-IV	D.P.T. degree NPTE	D.V.M. degree NAVLE	D.D.S./D.M.D. degree NBDE I-II Regional clinical skills exam	O.D. degree NBEO I-III (exc OK) State jurisprudence
No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
National Testing Centers (2)	Regional testing centers (6) in 5 cities	National testing center (with NBOME)	PearsonVue	Chiropractic colleges	Prometric	Prometric	Dental colleges (and potentially other universities) OSCE offered at Prometric	National Testing Center
1295	1290	1230	575*	1535	485*	650*	2000-3000+ (varies)	850
12 standardized patients (14 min each) and 9 min to chart 7 hrs total	12 standardized patients (15 min each) and 10 min to chart 8 hrs total	12 standardized patients (15 min each) and 10 min to chart 7.5 hrs total	Written 250 MC questions 6 hrs	Diagnostic imaging (20 stations x 2 min) Chiropractic testing (5 stations x 5 min) Case management (20 stations x 5 min) 2 hrs 25 min testing		Written 360 MC questions 6.5 hrs	4 major procedures 2-manikin 2-patient 2 days	4 stations (3 x 30 min) (1 x 15 min) 19 clinical skills 3.75 hrs
No	No	Yes (recently)	No	Yes (currently)		No	Yes (currently)	Yes (currently)
92.8% First-time 2017-2018	96% First-time 2016-2017	85-89% (?)	89.46% First-time 2018	88% - 2017 94% - 2018		89.1%* First-time 95-96%* Overall	85-99.8% 89.4%(I)* 91.7%(II)*	83% - 2016 81% - 2017
6504 (114,000)	19524 (1.1 million)	500-600 (14,000)	~15000 (312,500)	2500 (70,000)		3000 (71,060)	6238 (153,500)	1658 (37720)
Modified Angoff Hofstee	Modified Angoff Hofstee	Modified Angoff	---	Classical Test Theory IRT		---	Rasch model (IRT)	Modified Angoff

States with Minimum Exam Components

State	Case history	Visual acuity	Refraction	Binocularity	Ocular Motility	Tonometry	Internal examination	Pupils	Slit lamp exam	Comment
D.C.	X	X	X	X	X	X	X	X	X	Tonometry >12 yrs
Maine	X	X*	X	X	X		X		X	
Maryland	X	X	X	X	X	X	X			Tonometry > 40 yrs
North Dakota										“standard of care”
Puerto Rico										CL fitting
Rhode Island										“defined by department”
South Carolina	X	X	X			X	X	X	X	Visual field screening
South Dakota	X	X	X*	X	X	X	X	X	X	Accommodation, convergence, visual field screening
Tennessee		X	X*		X	X	X		X	Visual field screening, “Coordination testing”, CL fitting
Texas	X	X	X*	X		X	X		X	Accommodation, “angle of vision”
Virginia	X									CL fitting
Wisconsin	X	X	X*	X	X	X	X		X	“measuring corneal curvature”, convergence and accommodation

X= required

* Includes objective refraction

Simulations

2 BIO simulators

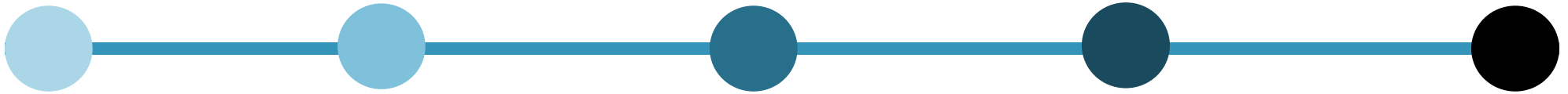
Slit lamp simulator

Foreign body removal model

Timeline

Spring 2019

Spring 2020



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12 stations with standardized patients

10 patient encounters

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

Patient Encounter

+

2 skills stations

Performance skills

Performance skills

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Competency Domains	Weight
Clinical Assessment and Interpretation	29
Management and Documentation	25
Skills	22
Patient Education	13
Communication and Professionalism	11
Total	100

Clinical Presentations	Weight
Anterior Segment Disease	17
Posterior Segment Disease	16
Glaucoma	14
Systemic Disease	11
Refraction	11
Neuro-Ophthalmic Disease	9
Contact Lenses	8
Binocular Vision	8
Pediatrics	6
Total	100

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PART III EXAM

Patient Encounters and Performance Skills (PEPS)

BLUEPRINT

10 patient scenarios

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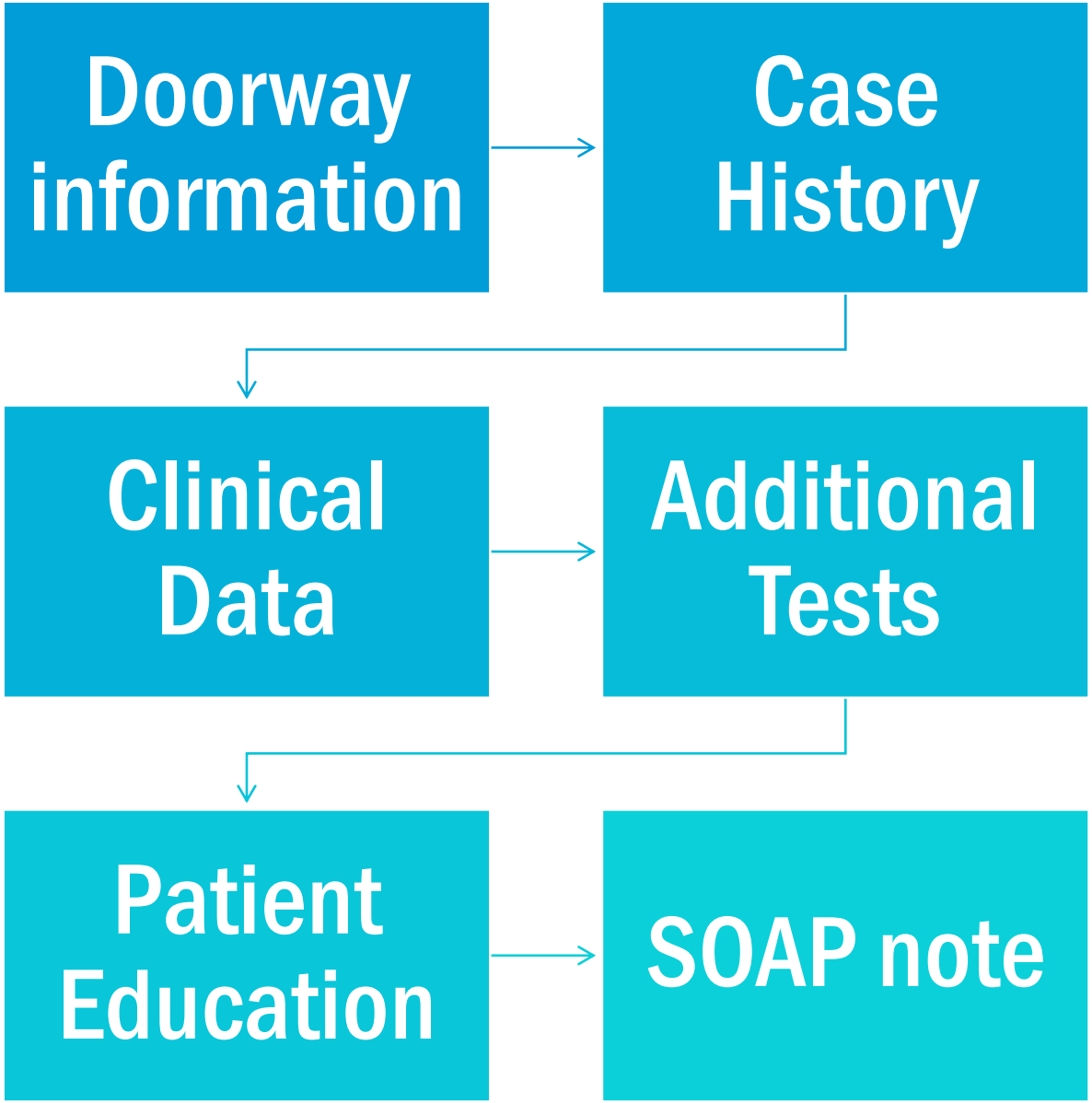
Format of Scenario Stations



Tonometry

Gonioscopy

Biomicroscopy

BIO

Dilated biomicroscopy

2 skills stations

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Where are we at now?

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2

committees are working to further develop the exam

Scenario Development Committee

Develop scenarios
Review and edit submitted cases

Exam Development Committee

Generate recommendations regarding exam structure, content, scoring

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Pilot Testing

Pilot 1

September 22

Analysis
Adjustment

Pilot 2

November 21

Case portrayal by SPs

Evaluation forms

Timing of stations

Format of scenario stations

SOAP note

Scale
Fidelity

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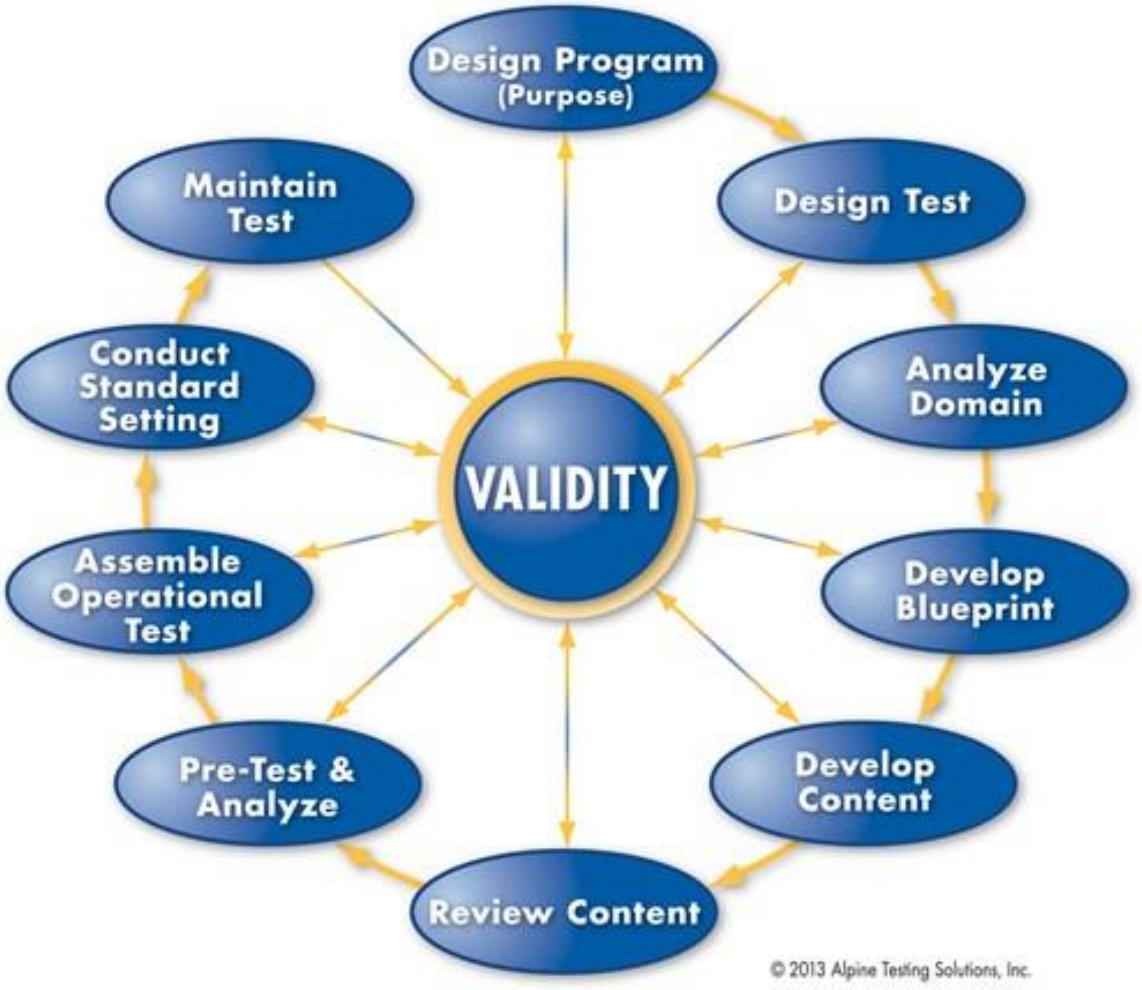
Examination Development Process

Brooke Houck, Ph.D.
Director of Psychometrics & Research

Test Development



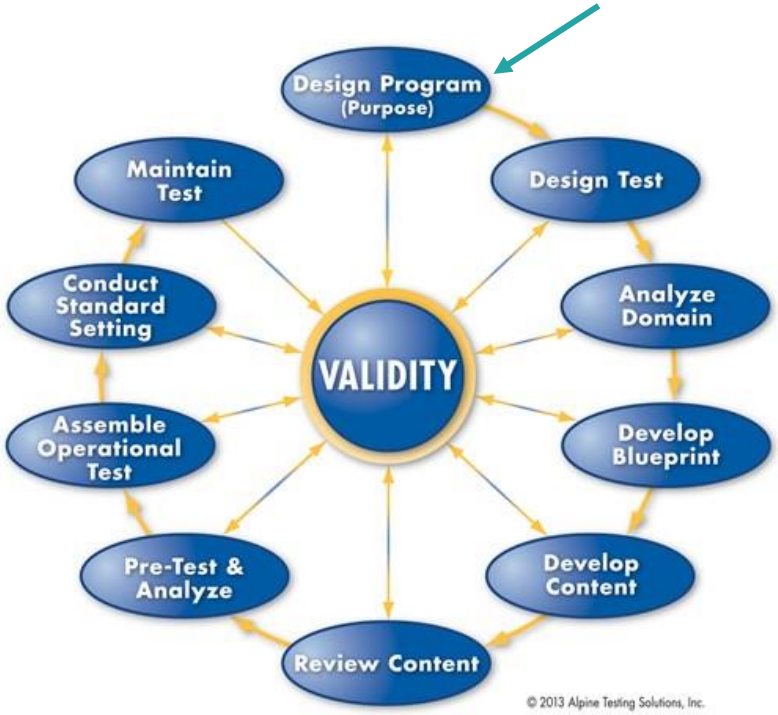
Validity

"Validity refers to the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests. Validity is, therefore, the most fundamental consideration in developing and evaluating tests."[1] (p.11).

To ensure a test is valid for assessment, we **determine if we have sufficient evidence** to allow us to draw inferences from the test results, and to take actions based upon those results.

[1]American Educational Research Association, American Psychological Association, National Council on Measurement in Education (2014). *Standards for Educational and Psychological Testing*. Washington, DC: AERA

Design Program (Purpose)



This initial and ongoing process determines key aspects of the testing program:

- *Goals*: What is the purpose of the test?
- *Audience*: Who are the stakeholders in the exam?

Design Test

Structured process to determine and document a test's defining characteristics:

- Test form
- Test administration format
- Score Reports

Analyze Domains

A review is conducted to define and document, knowledges and skills that are relevant to the test.

- *Knowledges*: What basic concepts and subject areas should appear on the test?
- *Skills*: What types of tasks should examinees be able to complete?

Develop Blueprint (Content Matrix)

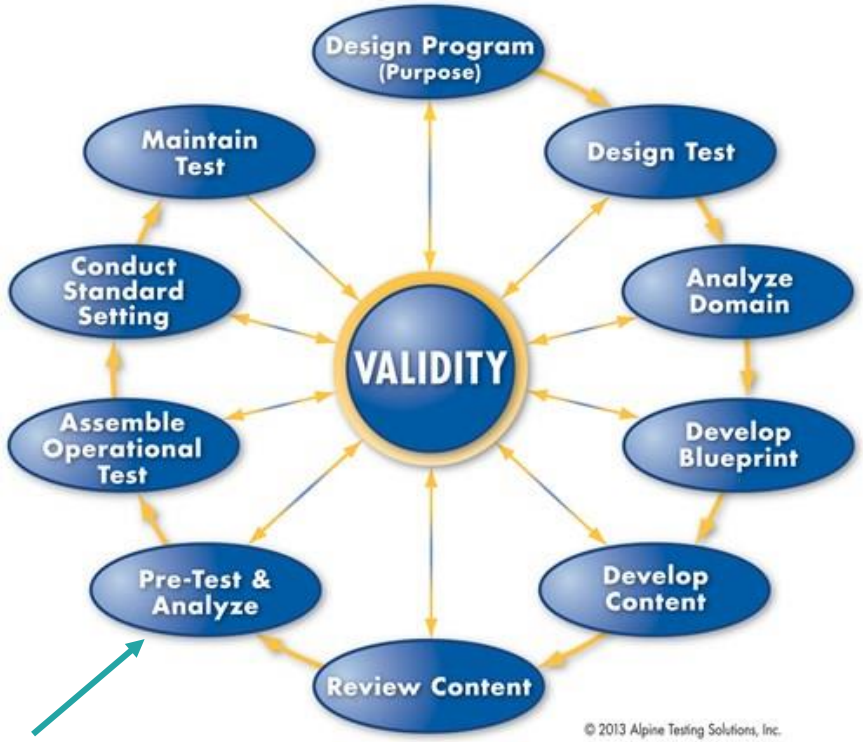
- How many test items/tasks should be devoted to each content area?
- What item format is most appropriate for each content area?
- How many items should be developed for each cognitive complexity level?

Develop & Review Content

- Test items/tasks are drafted, using the content areas determined by the Blueprint.
- The items/tasks are reviewed and revised, and approved for either pre-testing, further review and revision, or rejected.
- The result is a bank of items/tasks that **aligns with** the **blueprint** and the **intended interpretations and uses of test scores**.

Pre-Test & Analyze

- Items/tasks are administered as **pilot items on operational forms** to collect response data.
- After these items/tasks are piloted, they are **evaluated** for their usefulness based on statistical characteristics such as:
  - model fit,
  - difficulty, and
  - discrimination (the ability of the question to distinguish the minimally qualified candidate from the unqualified candidate).



Assemble Operational Test

- Committees and councils work to assemble items/tasks into one or more test forms that are administered to test takers to be scored.
- The forms meet the blueprint specifications and are balanced for content and statistical characteristics such as difficulty, discrimination, test time, reliability, and standard error.
- If an appropriate benchmark (i.e., pre-defined) cut score exists, the cut score on the new forms is equated to the benchmark.

Conduct Standard Setting

- If an appropriate cut score does not exist, a panel of experts reviews the test to establish performance standards for a minimally qualified candidate (MQC) to pass.

- Performance standards are translated into one a cut score for the test.

Conduct Standard Setting, cont.

- As a group, subject matter experts (SMEs) discuss the skills and abilities of the minimally qualified candidate (MQC).
- SMEs judge how they believe a minimally qualified candidate would likely perform on each item on the exam.
- They review and provide judgments for all items independently, each determining their own passing score.
- SMEs provide individual recommendations.
- Recommendations are combined, and an aggregate recommendation is calculated.
  - Statistically defensible cut score range determined.

Maintain Test

- Once a test is developed and put into operational use, it requires **ongoing care and attention** to improve upon or, at a minimum, maintain validity evidence.
  - Security Analyses
  - Creation and updating of new items/task
  - Job task analyses
  - Standard settings every 5-7 years
  - Using subject matter experts in our annual committees and councils to verify that each test contains questions that are up to date and relevant to current best practices
  - Calibrating examiners and standardized patients through training
  - Inter-rater reliability studies to ensure accuracy of scores on performance-based exams

Task Force to Review Alternative Testing Methodologies during COVID-19

Bill Rafferty, OD

Executive Director, North Carolina State Board of Optometry

Emeritus Professor, Duke University

Members of the Task Force

Bill Rafferty, OD (chair) – State Board Executive Director/ ARBO/NBEO

Larry Davis, OD – UMSL Dean/ASCO/NBEO

Donovan Crouch, OD – ARBO/NBEO

Jerry Richt, OD – NBEO Board Member/ ARBO

Patricia Bennett, MSW – ARBO Board Member/State Board Executive Director

Ron Hopping, OD, MPH –State Board Member/ARBO (NBERC)

Annabelle Storch, OD – recent AOSA President

Larissa Smith, PhD - NBOME Psychometrician

John Sicotte, MBA - NBEO Board Member

Lisa Fennell – ARBO Executive Director

Jill Bryant, OD, MPH – NBEO Executive Director

Patrick O'Neill, OD – ex-officio, ARBO President

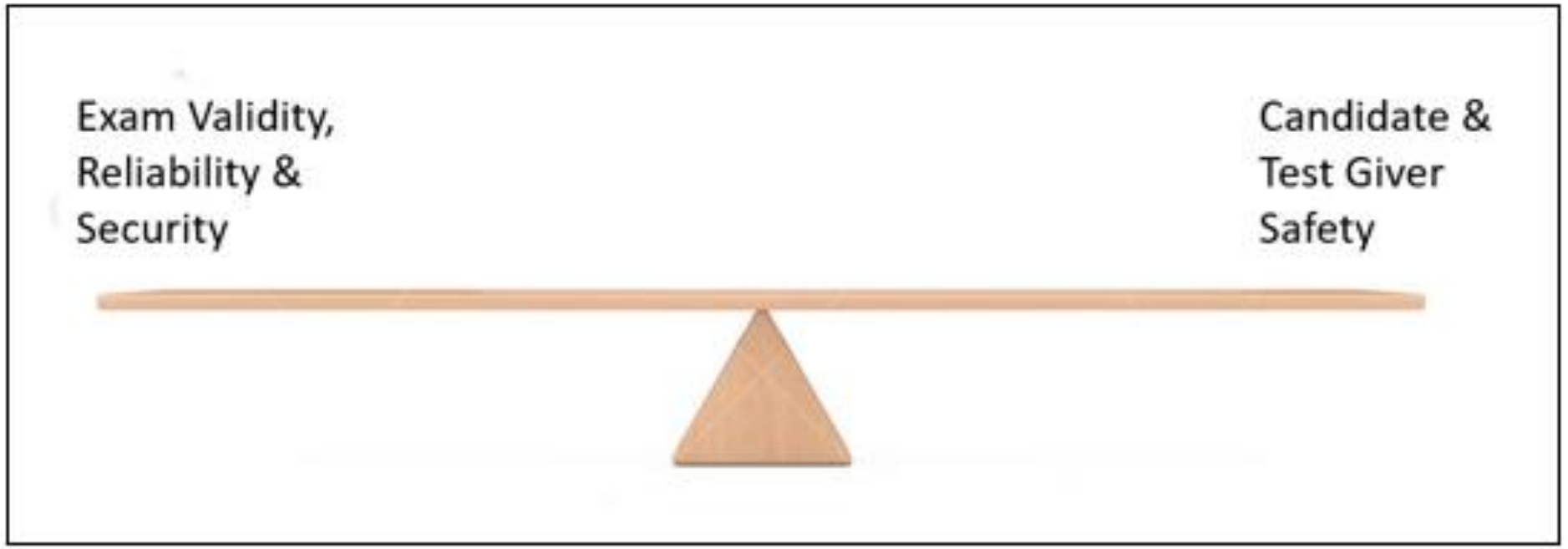
Lewis Reich, OD, PhD – ex-officio, NBEO President/SCO President/ASCO

Advisory to Task Force

Dennis Maynes, CESP – Caveon Chief Scientist, Data forensics

Brooke Houck, PhD -- NBEO Psychometrician

Task Force Approach



Task Force Recommendations

The Task Force ultimately recommended the following guidance to the NBEO Board of Directors:

1. Examination integrity, reliability, and validity must be maintained;
2. Any changes to testing should be able to be implemented within a 3-month time frame;
3. NBEO should make accommodations in the Part III CSE testing schedule to accommodate group travel of students from schools and colleges;
4. NBEO further investigate the feasibility of a temporary testing site on the west coast
5. Consider outreach for potential advocacy efforts by other organizations; and
6. NBEO should continue to negotiate scheduling options for the computer-based examinations with Pearson VUE.