



**The Royal Australian and New Zealand
College of Ophthalmologists**

A.C.N. 000 644 404

94 – 98 Chalmers Street, Surry Hills, N.S.W. 2010
AUSTRALIA

Telephone: +61 2 9690 1001

Facsimile: +61 2 9690 1321

E-mail: ranzco@ranzco.edu

<http://www.ranzco.edu>

Clinical Refraction Standards

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Curriculum Committee

Dr Con Moshegov (Chairman)
 Dr James La Nauze
 Dr Simon Permezel
 Dr Mark Renehan

Working Party Members

Dr Allan Bank	Dr Michael Goggin	Professor Anthony Molteno
Dr Ross Bengier	Associate Professor Glen Gole	Dr Justin Mora
Dr Michael Branley	Dr Ken Gullifer	Dr Con Moshegov
Dr Malcolm Capon	Dr Bruce Hadden	Dr Phillip Myers
Dr Theresa Casey	Dr Anthony Hall	Dr Justin O'Day
Dr Mark Chehade	Dr Ralph Higgins	Dr Simon Permezel
Dr Peter Cohen	Dr Alan Hilton	Dr Con Petsoglou
Dr Doug Cox	Dr Alex Hunyor Jnr	Dr Joe Reich
Dr Peter Cranstoun	Dr Margaret Kearns	Dr Mark Renehan
Dr Guy D'Mellow	Dr Ian Kennedy	Dr Peter Ring
Dr Mark Daniell	Dr Peter Macken	Dr Gary Schiller
Dr John Dickson	Associate Professor David Mackey	Dr Diana Semmonds
Dr Craig Donaldson	Dr Wendy Marshman	Dr James Smith
Dr Anthony Dunlop	Associate Professor Frank Martin	Dr Denis Stark
Dr David Ehrlich	Dr Peter Martin	Dr Mark Steiner
Dr Sid Finnigan	Professor Charles McGhee	Dr Walford Thyer
Dr Ross Fitzsimons	Dr David McKay	Dr Michael Waldie
Dr Graham Fraenkel	Dr Kerrie Meades	Dr Kristen Wells
Dr Fiona Fullerton	Dr Robyn Meusemann	Dr Stephanie Young
Dr Raf Ghabrial	Dr John Milverton	

Peer Reviewers

Dr Ross Agnello	Dr Diane Hartley	Dr Rob Paul
Dr Andrew Apel	Dr Oded Hauptman	Dr Simon Permezel
Dr Maged Atalla	Dr Tim Henderson	Dr Alex Poon
Dr Andrew Atkins	Dr Greg Horowitz	Dr Grant Raymond
Dr Paul Badenoch	Dr Alex Hunyor Snr	Dr Tim Roberts
Dr Sarah Booth-Mason	Dr Ian Hurley	Dr David Robinson
Dr Fabian Burgess	Dr Chris Kennedy	Dr Chris Rogers
Dr Malcolm Burvill	Dr Geoff Lam	Dr Julian Sack
Dr Susan Carden	Dr Sam Lerts	Dr Jenny Sandbach
Dr Dharmendran Chelvanayagam	Dr Cecilia Ling	Dr Allan Simpson
Dr James Chen	Dr Ross Littlewood	Dr Richard Smith
Dr Michael Coote	Dr Pat Lockie	Dr Grant Snibson
Associate Professor Helen Danesh-Meyer	Dr Jeff Long	Dr Rick Stawell
Dr Mark Daniell	Dr Michael Loughnan	Associate Professor Tim Sullivan
Dr John Dickson	Dr Wendy Marshman	Dr Gerard Sutton
Dr Catherine Dunlop	Dr Peter Martin	Dr Christine Tangas
Dr John Elder	Dr Kathy McClellan	Dr Mei-Ling Tay-Kearney
Dr Dick Galbraith	Dr Peter McCluskey	Dr Dzung Vu
Dr William Gillies	Dr Alan McNab	Dr Mark Walland
Dr Antonio Giubilato	Dr Richard Mills	Dr William Ward
Dr Bruce Hadden	Dr William Morgan	Dr Steve Wiffen
Dr Geoff Harley	Dr Con Moshegov	Dr David Workman

Project Manager

Victoria Baker-Smith

Workshop FacilitatorsVictoria Baker-Smith
Dario Tomat

HOW TO READ AND USE THE CLINICAL CURRICULUM PERFORMANCE STANDARDS

What Are Clinical Curriculum Performance Standards?

Clinical Curriculum Performance Standards are a written statement of the competencies required for effective performance in the workplace. A competency specifies the knowledge, skills, and behaviours required for ophthalmology, and the application of these at the standard required in the clinical or hospital setting.

Format and Style of Clinical Curriculum Performance Standards

Clinical curriculum performance standards use a particular format and style of language. This document will assist you to understand the various terms used in the documents.

RANZCO has used the following format to document its standards:

Item	What is it?	Example from Glaucoma Standards (see following page where these items have been labelled on a sample standard)
Unit Title	A unit title refers to a competency that can logically stand alone when applied in the work setting.	Characterise Glaucoma
Unit Number	The number of the unit of competency	GL 4
Unit Description	The unit description expands on the information provided in the unit title.	Description: This standard covers the classification of types of glaucoma, and making a working and differential diagnosis. Work is to be performed with total autonomy.
Elements	Elements of competency provide more information about the key purpose of the unit. They describe actions or outcomes that are demonstrable and assessable.	GL 4.1 Characterise risk factors for glaucoma.
Performance Standards	Performance standards specify what is assessed and the required level of performance. They specify the activities, skills, knowledge and understanding that provide the evidence of competent performance.	GL 4.1.1 Identify and prioritise risk factors including ocular hypertension and distinguish these from glaucoma.
Range of Variables	The Range of Variables specifies the range of contexts and conditions to which the performance criteria apply.	See back section of Glaucoma standards.
Evidence Guide	The evidence guide guides assessment of the unit of competency. It relates directly to the performance standards and range statement.	See back section of Glaucoma standards.

Reference: Information in the table above is based on the Australian National Training Authority's *Training Package Development Handbook*.

Sample Curriculum Performance Standard***Unit Number*****GL 4*****Unit Title*****Characterise Glaucoma*****Description*****Description**

This standard covers the classification of types of glaucoma, and making a working and differential diagnosis. Work is to be performed with total autonomy.

Elements***Performance Standards***

Elements		Performance Standards	
GL 4.1	Characterise risk factors for glaucoma	GL 4.1.1	Identify and prioritise risk factors including ocular hypertension and distinguish these from glaucoma.
GL 4.2	Characterise primary glaucoma	GL 4.2.1	Identify primary open and closed angle glaucomas.
GL 4.3	Characterise secondary glaucoma	GL 4.3.1	Identify the causes and varieties of secondary glaucoma.
GL 4.4	Characterise congenital and developmental glaucoma	GL 4.4.1	Identify congenital glaucoma
		GL 4.4.2	Identify glaucoma associated with developmental disorders
GL 4.5	Perform a differential diagnosis	GL 4.5.1	Differentiate between glaucoma and other conditions causing visual field loss or optic nerve abnormalities including congenital anomalies.

CR 1 Adult Refraction

Description This unit covers the performance of refraction on an adult patient and the prescription of spectacles. This work is to be performed with total autonomy.

Elements		Performance Standards	
CR 1.1	Determine and record previous spectacle and contact lens wear	CR 1.1.1	Use questioning to elicit information about previous use of: <ul style="list-style-type: none"> • Multifocal spectacles • Bifocal spectacles • Soft and hard contact lenses • Prism incorporated into spectacles • Enquire about history of previous refractive surgery
CR 1.2	Use manual and automatic lensometers to examine lenses and additional instructions to assist in the initial estimation of refractive error	CR 1.2.1	Set up equipment as per manufacturer's specifications
		CR 1.2.2	Test lens correctly positioned on instrument
		CR 1.2.3	Establish lens centration
		CR 1.2.4	Correctly identify power of unknown lenses
CR 1.3	Prepare and position patient for each test procedure	CR 1.3.1	Explain test procedure to patient
		CR 1.3.2	Instruct patient what to do during the test
		CR 1.3.3	Adjust equipment to ensure test reliability, and patient and operator comfort
CR 1.4	Use keratometry and corneal topography to assist in refraction as appropriate	CR 1.4.1	Use an autokeratometer to quantify corneal astigmatism
		CR 1.4.2	Use a manual keratometer to exclude or identify irregular mires as a sign of irregular astigmatism
CR 1.5	Obtain objective measurement of refractive error	CR 1.5.1	Perform and interpret the results of retinoscopy allowing for working distance and ocular pathology
		CR 1.5.2	Adjust retinoscope to plane or concave mirror effect
		CR 1.5.3	Record refraction to within ½ dioptre sphere and cylinders
		CR 1.5.4	Transpose results of retinoscopy to a provisional spectacle prescription
		CR 1.5.5	Be familiar with the use of autorefractors and aberrometers in estimating refractive error

Elements		Performance Standards	
CR 1.6	Perform subjective refraction	CR 1.6.1	Accurately refine sphere and cylinder component of refractive error using: <ul style="list-style-type: none"> • Trial frame • Trial lens set • Jackson cross cylinder • Tests to avoid over correcting myopic eyes including duochrome test
		CR 1.6.2	Be familiar with phoropter heads
		CR1.6.3	Determine and individualize near vision requirement
CR 1.7	Prescribe spectacles	CR 1.7.1	Consider factors influencing final prescription <ul style="list-style-type: none"> • Interpupillary distance (IPD) • BVD • Anisometropia • Amblyopia • Ocular motor balance • Prismatic requirement
CR 1.8	Advise on lens type, filters and coatings to suit individual needs	CR 1.8.1	Discuss spectacle options with the patient to enable them to make an informed decision: <ul style="list-style-type: none"> • Separate pairs of spectacles • Biofocals • Multifocals • Binocular balancing
		CR 1.8.2	Discuss lens shape and materials, and frame types and materials, with patient to enable them to make an informed decision
CR 1.9	Have a knowledge of prescription of contact lenses	CR 1.9.1	Be familiar with different types of contact lenses and basic principles of fittings and prescribing contact lenses

CR 2 Paediatric Refraction

Description: This unit covers the performance of refraction on paediatric patients and the prescription of spectacles. Work is to be performed with total autonomy.

Elements	Performance Criteria
CR 2.1 Determine and record previous spectacle and contact lens wear	CR 2.1.1 Use questioning to elicit information about previous use of: <ul style="list-style-type: none"> • Multifocal spectacles • Bifocal spectacles • Soft and hard contact lenses • Prism incorporated into spectacles
CR 2.2 Prepare and position patient for each test procedure	CR 2.2.1 Explain test procedure to patient and parent/s CR 2.2.2 Instruct patient what to do during the test CR 2.2.3 Adjust equipment to ensure test reliability, and patient and operator comfort
CR 2.3 Perform cycloplegic refraction	CR 2.3.1 Demonstrate an understanding of the effects, duration, side effects and relevance of cycloplegic agents CR 2.3.2 Demonstrate an understanding of the use and role of cycloplegic agents in the refraction of children CR 2.3.3 Manage appropriately the refraction of the uncooperative child
CR 2.4 Obtain objective measurement of refractive error.	CR 2.4.1 Adjust retinoscope to plane or concave mirror effect CR 2.4.2 Perform and interpret the results of retinoscopy allowing for working distance and ocular pathology CR 2.4.3 Record refraction to within ½ dioptre sphere and cylinders CR 2.4.4 Translate results of retinoscopy to a provisional spectacle prescription CR 2.4.5 Be familiar with the use of autorefractors and aberrometers in estimating refractive error

Elements	Performance Criteria
CR 2.5 Perform subjective refraction.	CR 2.5.1 Attempt to refine sphere and cylinder component of refractive error if appropriate using: <ul style="list-style-type: none"> • Trial frame • Trial lens set • Jackson cross cylinder • Tests to avoid over correcting myopic eyes including duochrome test CR 2.5.2 Be familiar with phoropter heads
CR 2.6 Prescribe spectacles	CR 2.6.1 Demonstrate a knowledge of the development of normal refractive error in childhood CR 2.6.2 Demonstrate a knowledge of abnormal refractive error and timing of spectacle correction CR 2.6.3 Demonstrate an understanding of the effect of spectacle correction on disease states CR 2.6.2 Consider factors influencing final prescription <ul style="list-style-type: none"> • BVD • Anisometropia • Amblyopia • Ocular motor balance
CR 2.7 Have a knowledge of prescription of contact lenses	CR 2.7.1 Be familiar with different types of contact lenses and basic principles of fitting and prescribing contact lenses

Range of Variables

The range of variables explains the scope and context of the standard allowing for differences amongst workplaces. The scope of variables chosen for assessment will depend on the requirements of the particular work situation.

Scope of Work

Practitioners are to:

- demonstrate an appropriate attitude, and appropriate cultural sensitivities, in dealing with patients
- perform work with a diverse range of patients, including patients of any age range, patients with language barriers or verbal disabilities, and patients with diminished mental faculties
- obtain information from patients using appropriate communication/interpretive services
- obtain and evaluate information from third party sources present with the patient
- distinguish information that may indicate non-organic illness, and adequately manage the subsequent consultation process
- work with restricted access to diagnostic equipment.

The equipment practitioners are expected to use to perform the scope of work will vary greatly in its relevance to the problem at hand and availability. The following applies to all of the RANZCO clinical curriculum performance standards:

Visual acuity charts

Trial lens sets

Slit lamps

Tonometers: Goldmann, Tonopen

Gonioscopy lenses: Goldmann, Zeiss and Koeppe

Biomicroscopy lenses: 60, 78, 90D and others

Ophthalmoscopes: direct and indirect

Topical anaesthetics, fluorescein, mydriatics

Placido disc

Corneal pachymeters: optical and ultrasound

Ultrasound: A and B scans

IOL Master

Keratometers

Corneal topographers

Wavefront analyser (aberrometer)

Specular and confocal microscopes

Hoskins suturelysis lens

Iridotomy lens

Bandage contact lens

Simmon's shell

Visual field analysers

Fundus cameras

External clinical photographic apparatus

Torches

Argon and YAG lasers

Surgical microscopes
Surgical instruments, prostheses and disposables

Evidence Guide

The Evidence Guide reflects the critical aspects of assessment including the essential elements of knowledge and skill that need to be demonstrated to confirm competency in the standards. The Evidence Guide should be read in conjunction with the range of variables, elements and performance standards.

A Critical Aspects of Assessment Evidence

How is competence achieved?

To achieve this *standard*, the practitioner is to meet each of these conditions:

- complete and demonstrate on a *frequent* basis each *element* of competence autonomously and achieve the *performance standards* for each element.
- for each *element*, demonstrate adequate understanding and performance of the *knowledge and the skills* outlined in Part C of this evidence guide
- demonstrate that the *performance standards* for each *element* can be achieved across the *range of variables*.

Assessment Method

OBCK examination

B Interdependency of Units

Each of the five modules (CR1-CR2) in this group are interdependent and complements the others.

C Knowledge and Skills

In order to fulfill the *performance standards*, the practitioner requires the following *knowledge and skills*:

Basic Science

- Anatomy of the eye and visual pathways
- Physiology of the eye and visual pathways
- Pathology of the eye and visual pathways
- Medical physiology
- Medical pharmacology, ocular pharmacology
- Genetics
- Epidemiology
- Optics and refraction
- Occupational health & safety
- Clinical literature review and evidence based medicine

- Ophthalmic instrumentation

Clinical

- Changes of refraction with age: acquired myopia, myopia due to nuclear sclerosis, hypermetropia and presbyopia
- Far and near point of the eye
- Emmetropia
- Ametropia
- Hypermetropia and its subdivisions: latent manifest, facultative, absolute, total
- Myopia
- Astigmatism: compound, simple, mixed, regular and irregular
- Correction of ametropia: ocular and spectacle refraction
- Anisometropia and aniseikonia
- Refractive state and genetic inheritance
- Accommodation: range and amplitude, age related values
- Duochrome test
- Astigmatic fan and Jackson cross cylinder
- Presbyopia correction: back vertex distance and power
- Forms of lenses: bifocals, trifocal and multifocals (manufacturing techniques not required)
- Spectacle magnification and relative spectacle magnification (simple formulae only)
- The trial case and frames
- Writing spectacle prescriptions. Transposition.
- Aphakia and its correction: spectacles, contact lenses and intra-ocular lenses
- Theory of multifocal and accommodating intra-ocular lenses (basic understanding only)
- Sun glasses
- Spectacle lens materials
- Contact lenses: trial fitting, types, over refraction and prescription

Equipment

- Visual acuity chart
- Trial lens set
- Retinoscope
- Autorefactor
- Slit lamp
- Biomicroscopy lens: 60, 78, 90D and others
- Ophthalmoscopes: direct and indirect
- Keratometer
- Corneal topographer/pachymeter
- Lensometer
- Retinoscope
- Contrast sensitivity chart
- Phoropter heads
- Jackson cross cylinder
- Duochrome test
- Prisms
- Low vision aids

General

Meet specific requirements of specialist practice including:

- applying ethical principles
- exercising professional judgement
- communicating effectively with patients, colleagues and staff
- consulting, collaborating or referring as necessary to provide appropriate ophthalmic care
- following protocols and complying with legal requirements
- modifying the examination of patients with physical or intellectual disabilities
- using interpreter services when dealing with people who are Deaf or who are from a non-English speaking background
- using, calibrating and maintaining ophthalmic equipment
- keeping appropriate comprehensive medical records
- using documentation and record systems including, where appropriate, the use of computer, information systems and technologies
- observing occupational health and safety requirements including disinfection and sterilisation
- ensuring patients have a realistic understanding of anticipated outcomes of treatment
- adhering to patient confidentiality and privacy protocols and legislation
- participating in and promoting continuing professional development and competency enhancement
- adhering to ethical standards in advertising

D Resource Implications

Duke-Elder WS, *System of Ophthalmology* Vol 5 - Ophthalmic Optics & Refraction. London: Henry Kimpton, 1962

American Academy of Ophthalmology, *Basic and Clinical Science Course: Section 3 – Optics, Refraction and Contact Lenses*. San Francisco, American Academy of Ophthalmology

Spencer and Mets. *Refractive Guidelines: Ophthalmology Clinics of North America*, 1990.

E Consistency of Performance

The practitioner's competence should be assessed from evidence collected across the whole range of activities covered by this unit. This entails the assessment of each *element* of competence across the *range of variables*, and evidence of the basic and clinical knowledge underpinning performance, to ensure all *performance standards* are met.

Supervisors' reports on a trainee's management of refractive error and attendance at clinics are to be available to assessors.