

1. HISTORY TAKING

A. Presenting Complaint/History of Presenting Illness

- Signs and symptoms
- Triage
- Refractive status
- Injury
- Contact lenses
- Confidentiality

B. Past Ocular History

- Refractive status problems
- Injury
- Diseases and prescriptions
- Surgery and laser
- Contact lenses

C. Family History

- Diabetes
- Glaucoma
- Hypertension
- Ocular diseases and dystrophies
- Strabismus
- Other

D. Systemic Illness, Past and Present

- Hypertension
- Diabetes
- Cardiac problems
- Pulmonary problems
- Arthritis
- Sickle Cell disease
- Surgical procedures
- Major infections
- Other

E. Medications

- Aspirin-containing medications
- Diuretics
- Blood pressure medications
- Birth control pills
- Steroids
- Other

F. Allergies and Drug Reactions

- Penicillin
- Sulfa
- Local anesthesia
- Fluorescein
- Other

G. Partially Sighted Patient

- Onset of visual loss
- Use of low vision aids
- Problems/goals
- Home/family/community support

2. BASIC SKILLS AND LENSOMETRY

A. Method of

Measuring/Recording Acuity

- Distance acuity
- Near acuity
- Children
- Low vision
- Illumination of target and background
- Pinhole
- Artifacts
- Recording

B. Color Vision Testing

- Color plates
- D-15
- Farnsworth-Munsell
- Physiology
- Children

C. Lensometry

- Sphere
- Cylinder power/axis
- Prism

- Multifocal power
- Multifocal induced prism
- Base curve
- Lensometer
- Lens "clock"
- Estimation with loose lenses
- Aphakic lenses
- Recording prescription
- Transposition

D. A-scan Biometry

E. Exophthalmometry

F. Amsler Grid

G. Schirmer Tests

H. Evaluation of Pupils

I. Estimation of Anterior Chamber Depth

3. Patient Services

A. Ocular Dressings and Shields

- Indications
- Proper use

B. Drug Delivery

(Advantages/Disadvantages)

- Drops
- Ointments
- Sustained release
- Injections
- Systemic
- Complications

C. Spectacle Principles

- Interpupillary distance
- Frames
- Multifocals
- "Safety" lenses and frames
- Adjustments and repair
- Care of spectacles
- Lens materials

D. Assisting Patient

- Physically disabled
- Visually disabled
- Pediatric/children

E. Minor Surgery

- Assisting surgeon
- Instructing patient

4. BASIC TONOMETRY

A. Applanation

- Principles
- Errors
- Cleaning and sterilizing
- Advantages/disadvantages
- Technique

B. Non-Contact

C. Complications and Contraindications

D. Scleral Rigidity

- General concepts
- Methods of assessing scleral rigidity

E. Factors Altering Intraocular Pressure

- Squeezing eyelids
- Heartbeat
- Breath holding
- Tight collar
- Body position
- Other

5. INSTRUMENT MAINTENANCE

A. Acuity Projectors

B. Ophthalmoscopes

- Direct
- Indirect

C. Retinoscopes

D. Lensometers

E. Perimeters

F. Tangent Screen

G. Phoropters

H. Slit Lamps

I. Ultrasound

J. Keratometers

K. Lenses

L. Tonometers

M. Muscle Light

N. Special Instruments (Equipment)

O. Surgical Instruments

6. GENERAL MEDICAL KNOWLEDGE

A. Cardiopulmonary Resuscitation

- Fainting
- Cardiac arrest
- Acute drug reaction

B. Anatomy

- Cardiovascular
- Respiratory
- Endocrine
- Nervous
- Ocular

C. Physiology

- Cardiovascular
- Respiratory
- Endocrine
- Nervous
- Ocular

D. Systemic Diseases

- Diabetes
- Hypertension
- Cancer
- Atherosclerosis
- Blood
- Infections
- Blood dyscrasia
- Infectious disease

E. Ocular Diseases

- Refractive errors
- Infection
- Injury
- Red eye
- Presbyopia
- Other common disorders

F. Ocular Emergencies

- First aid
- Management in the absence of the physician

G. Metric Conversions

H. Fundamentals of Microbial Control

- Sanitation
- Disinfection
- Sterilization
- Contamination

7. CLINICAL OPTICS

A. Optics

- Geometric
- Clinical
- Physiologic

B. Retinoscopy

- Principles
- Techniques

C. Refractometry

- Fogging
- Astigmatic dials
- Cross cylinder
- Duochrome
- Accommodation
- General principles

D. Advanced Spectacle Principles

- Vertex distance
- Prism correction
- Bicentric grinding (slab off)
- Aphakic spectacles

E. Low Vision Aids

8. BASIC OCULAR MOTILITY

A. Extraocular Muscle Actions

B. Strabismus

- Phoria/tropia
- Horizontal deviations
- Vertical deviations
- Pseudostrabismus
- Paralytic (including primary and secondary deviations)

C. Amblyopia Detection

D. Evaluation Assessment Methods

- Cover/uncover, alternate cover tests
- Krimsky/Hirschberg
- Diagnostic positions of gaze
- Maddox rod
- Worth 4-dot
- Stereopsis
- Near point of convergence and accommodation
- Ductions and versions, head tilt
- Vergences
- Risley prism
- Diplopia (e.g., Red glass)
- Fusion (e.g., Bagolini lens)

9. VISUAL FIELDS

A. Visual Pathways

- Retina
- Retinal nerve fiber layer
- Optic nerve
- Chiasm
- Optic tract
- Lateral geniculate body
- Optic radiation
- Occipital cortex

B. Visual Fields

- Visual field terminology (isopters, threshold, apostilb, decibel)
- Definition of the visual field
- The "island of vision" analogy

C. Methods of Measuring the Visual Field

- Screening (single stimulus, multiple stimuli, Harrington-Flocks screener, others)
- Threshold perimetry

D. Techniques

- Manual (confrontation, tangent screen, autoplot, arc perimeter, Goldmann)
- Automated (Humphrey, Octopus, Dicon, others)
- Kinetic perimetry
- Static perimetry

E. Errors in Visual Field Testing

- Machine calibration
- Recording and printing results
- Correcting lens (power and positioning)
- Stimulus selection
- Patient preparation (instructions, positioning, comfort, special situations, e.g., low vision, wheelchairs)
- Test selection
- Catch trials, fixation losses, and fluctuation
- Artfactual loss

F. Visual Field Defects from Disease

- Retinal disease
- Optic nerve disease (glaucoma, drusen, optic neuritis)
- Neurological
- Non-organic

10. CONTACT LENSES

A. Basic Principles

- Hard lenses

- Soft lenses
- Toric lenses
- Astigmatism
- Bifocal
- Aphakic
- Extended wear
- Gas permeable
- Truncated
- Bandage lenses
- Oxygen permeability
- Lens characteristics
- Rigid lenses

B. Fitting Procedures

- Keratometry
- Corneal diameter
- Pupil diameter
- Tear secretion
- Eyelid tightness and fissure size
- Fluorescein pattern
- Spectacle prescription conversion
- Over-refraction
- Pediatric
- Contraindications

C. Patient Instruction

- Insertion
- Removal
- Cleaning
- Storage
- Hygiene
- Solutions
- Wearing time

D. Troubleshooting Problems

- Tight
- Loose
- Vascularization
- Ulcers
- Spectacle blur
- Giant papillary conjunctivitis
- Deposits
- Pain
- Keratoconus
- Edema
- Solutions
- Modifications
- Vision

E. Verification of Lenses

- Power
- Base curve
- Diameter
- Central thickness
- Edge profile

11. INTERMEDIATE TONOMOMETRY

A. Aqueous Humor Dynamics

B. Glaucoma

- Basic mechanisms
- Angle closure
- Open angle
- Cupping
- Basic medical management
- Basic surgical management

C. Indentation

- Principles
- Errors
- Cleaning and sterilizing
- Advantages/disadvantages
- Technique

12. OCULAR PHARMACOLOGY — Types, Strengths, Actions, and Complications

A. Anesthetics

B. Mydriatics and Cycloplegics

C. Epinephrine

D. Beta-Blockers

E. Miotics

F. Steroids

G. Antibiotics

H. Carbonic Anhydrase Inhibitors

I. Vasoconstrictors

J. Antihistamines

K. Osmotic Agents

L. Nonsteroidal Anti-Inflammatories

M. Others

13. PHOTOGRAPHY

A. Basics of Photography

- Film
- Exposure
- Focal length
- Depth of field
- Synchronization
- Beam splitters
- Reticles
- Ocular
- Focus
- Video
- Astigmatic correction

B. Fundus Photography

C. Defects/Artifacts

14. MICROBIOLOGY

A. Inflammatory Response

- Infectious
- Non-infectious
- Cell types
- Cell function

B. Microscopy

- Bacteria identification
- Viral inclusions
- Disease correlation with microscopic findings

C. Staining

- Gram
- Giemsa
- Wright
- Special

D. Culture Media

- Bacterial
- Viral
- Fungal
- Other

E. Specimen Collection and Processing

- Collecting
- Labeling
- Fixing
- Staining
- Culturing

15. ADVANCED TONOMOMETRY

A. Pathophysiology of Glaucoma

- Structural changes
- Deterioration of function
- Secondary glaucoma
- Ocular hypertension
- Congenital glaucoma

B. Tonometry Theory

- Applanation
- Indentation

C. Managing Tonometry Problems

- Corneal irregularity and scarring
- High astigmatism
- Orbital disease

16. ADVANCED VISUAL FIELDS

A. Advanced Principles of Visual Field Testing

- Dynamic-kinetic field testing
- Static field testing
- Binocular field testing

Continued

- B. Etiology and Description of Less Common Defects**
 - Toxic
 - Steep vs. sloping margins
 - Absolute vs. relative
 - Nasal steps
 - Altitudinal
 - Scotomata
- 17. ADVANCED COLOR VISION**
 - A. Physiology/Theory**
 - B. Defects**
 - Anomalous trichromats
 - Dichromats
 - Monochromats and achromatopsia
 - C. Advanced Testing Techniques**
 - Anomaloscope
 - Other
- 18. ADVANCED CLINICAL OPTICS**
 - A. Advanced Refractometry**
 - Stenopeic slit
 - Automated refractometers
 - Merits of subjective vs. objective
 - Low vision patients
 - B. Advanced Optics**
 - Simple lens systems
 - Compound lens systems
 - Plane mirrors
 - Curved mirrors
 - Accommodative range
 - Accommodative amplitude
 - Presbyopia
 - Low vision aids
 - Induced prism
 - Safety lenses
 - Schematic eye
 - Conoid of Sturm
- 19. ADVANCED OCULAR MOTILITY**
 - A. Amblyopia**
 - Classification
 - Treatment
 - Cause
 - B. Anatomy and Physiology of the Extraocular Muscles**
 - Location
 - Innervation
 - C. Binocular Function**
 - Hering's Law
 - Sherrington's Law
 - AC/A ratio
 - Angle kappa
 - Fusional amplitude
 - Stereopsis
 - Nystagmus
 - Convergence and divergence
 - Panum's area
 - Retinal correspondence
- 20. ADVANCED PHOTOGRAPHY**
 - A. Fluorescein Angiography**
 - Principle
 - Filters (exciter, barrier)
 - Fluorescein administration
 - Photography technique and sequence
 - Fluorescence
 - B. Slit Lamp**
 - C. External**
 - D. Specular Micrography**
 - E. Film Processing**
- 21. ADVANCED PHARMACOLOGY**
 - A. Basic Concepts of Topical Medications**
 - Stability
 - pH
 - Tonicity
 - Sterility
 - Adverse effects
 - B. Mechanism of Action and Desired Effects**
 - Sympathomimetics
 - Sympatholytics
 - Parasympathomimetics
 - Parasympatholytics
 - Cholinesterase inhibitors
- 22. SPECIAL INSTRUMENTS AND TECHNIQUES**
 - A. Ophthalmic Lasers**
 - Argon
 - Krypton
 - Excimer
 - CO₂
 - Other
 - B. Imaging Techniques**
 - Computerized tomography (CT scans)
 - Magnetic resonance imaging (MRI)
 - Ultrasonography
 - C. IOL Power Computation**
 - D. Electrodiagnostics**
 - Electroretinography
 - Electrooculography
 - Visually evoked potential
 - E. Dark Adaptometry**
 - F. Macular Function Testing**
 - G. Pupillography**
 - H. Ophthalmoscope**
 - I. Slit Lamp**
 - J. Photokeratoscope**
 - K. Pachymetry**
 - L. Low Vision Equipment**
 - M. Contrast Sensitivity**
- 23. ADVANCED GENERAL MEDICAL KNOWLEDGE**
 - A. Ocular Manifestation of Systemic Diseases**
 - Diabetes mellitus
 - Hypertension
 - Atherosclerosis
 - Thyroid disease
 - Pituitary disease
 - Brain tumors
 - Other
 - B. Low Vision/Blindness**
 - Legal
 - Total
 - Functional
 - Psychological/social aspects
 - C. Ocular Disease**
 - Infectious
 - Immunologic
 - Congenital
 - Malignant
 - Other
 - D. Trauma**

Content Areas - Multiple-Choice *Please check JCAHPO's Web site for updates.

(Effective mid-to-late 2009)

CONTENT AREA		% of exam
1	History Taking	3
2	Pupillary Assessment	4
3	Equipment Maintenance and Repair	3
4	Lensometry	6
5	Keratometry	3
6	Medical Ethics, Legal and Regulatory Issues	5
7	Microbiology	5
8	Pharmacology	8
9	Ocular Motility	11
10	In-office Minor Surgical Procedures	3
11	Ophthalmic Patient Services & Education	10
12	Ophthalmic Imaging	6
13	Refractometry	6
14	Supplemental Skills	10
15	Tonometry	5
16	Visual Assessment	6
17	Visual Fields	6

The COMT examination will include questions from each content area. Possible question topics are listed below, under each content area. Some topics may appear similar to those covered at other certification levels, but the level of difficulty and type of knowledge tested at the COMT level is different.

(Effective mid-to-late 2009).

1. HISTORY TAKING

- Ocular
- Medical
- Medication
- Social
- Family

2. PUPILLARY ASSESSMENT

- Measure
- Compare
- Evaluate
- RAPD

3. EQUIPMENT MAINTENANCE AND REPAIR

- Ophthalmic lenses, instruments, and equipment
 - i. Clean & lubricate
 - ii. Tighten screws
 - iii. Replace parts

4. LENOMETRY

- Ground-in prism
- Slab-off
- Neutralize spectacles

5. KERATOMETRY

- Corneal curvature

6. MEDICAL ETHICS, LEGAL AND REGULATORY

- Government and institutional rules and regulations
- Quality assurance
- Ethical & legal standards
- Scribing
- Charting
- Confidentiality
- Informed consent

7. MICROBIOLOGY

- Office antisepsis
- Universal precautions

8. PHARMACOLOGY

- Ocular medications (instilling and identifying)

- Educate patients on medications
- Drug reactions

9. OCULAR MOTILITY

- Version and duction
 - i. Function
 - ii. Anomalies
- Near point of convergence
- Cover tests
- Strabismus with prisms
- Stereoacuity
- Worth 4-Dot
- Near point of accommodation
- Hirshberg
- Krimsky
- Nystagmus

10. IN-OFFICE MINOR SURGICAL PROCEDURES (ASSIST)

- Instrument preparation
- Sterile fields
- Aseptic technique

11. OPHTHALMIC PATIENT SERVICES AND EDUCATION

- Patient education:
 - i. Surgery
 - ii. Systemic & ocular diseases
 - iii. Anatomy & physiology (general)
 - iv. Anatomy & physiology (ocular)
 - v. Safety glasses
- Patient instruction:
 - i. Medication
 - ii. Tests
 - iii. Procedures
 - iv. Treatments
- Patient flow
- Triage
- Forms & Manuals
- Cardiopulmonary emergencies

12. OPHTHALMIC IMAGING

- Fundus photography
- Diagnostic/standardized A-scan
- Corneal topography
- Scanning laser tests for glaucoma/retina
 - i. HRT
 - ii. GDx
 - iii. OCT

13. REFRACTOMETRY

- Retinoscopy
- Manifest refractometry

14. SUPPLEMENTAL SKILLS

- IOL power calculation
- A/C Depth
- Pachymetry
- Calibrate biometry instruments
- Glare testing
- Color vision testing
- Contact A-scan
- Immersion A-scan
- Laser interferometry

15. TONOMETRY

- Goldmann applanation tonometer
 - i. Clean
 - ii. Disinfect
 - iv. Calibrate
- Intraocular pressure

16. VISUAL ASSESSMENT

- Visual acuity
 - i. Optotype
 - ii. Special situations
- Pinhole acuity

17. VISUAL FIELDS

- Amsler Grid
- Confrontation Fields
- Automated perimetry