Appendix B: Content Outlines for the COA, CCOA, COT, and COMT Multiple-Choice Examinations

COA/CCOA candidates are examined in Content Areas 1-6.
COT candidates are examined in Content Areas 1-13.
COMT candidates are examined in Content Areas 1-23.

	CONTENT AREA	COA/CCOA	COT	COMT
1	History Taking	20%	7%	1%
2	Basic Skills & Lensometry	17%	8%	2%
3	Patient Services	16%	4%	1%
4	Basic Tonometry	15%	4%	1%
5	Instrument Maintenance	11%	6%	2%
6	General Medical Knowledge	21%	10%	3%
7	Clinical Optics		14%	10%
8	Basic Ocular Motility		10%	5%
9	Visual Fields		12%	7%
10	Contact Lenses		10%	8%
11	Intermediate Tonometry		4%	3%
12	Ocular Pharmacology		8%	6%
13	Photography		3%	2%
14	Microbiology			2%
15	Advanced Tonometry			3%
16	Advanced Visual Fields			4%
17	Advanced Color Vision			2%
18	Advanced Clinical Optics			8%
19	Advanced Ocular Motility			7%
20	Advanced Photography			4%
21	Advanced Pharmacology			5%
22	Special Instruments and Techniques			8%
23	Advanced General Medical Knowledge			6%

Note: Percentages indicate the percentage of the total examination devoted to the content area.

1. HISTORY TAKING

A. Presenting Complaint/History of Presenting Illness

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

B. Past Ocular History

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

C. Family History

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

D. Systemic Illness, Past and Present

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

E. Medications

- Aspirin-containing medications
- Birth control pills
- Diuretics
- Steroids
- Blood pressure medications
- 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/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
- Aphakic spectacles
- Prism correction
- Bicentric grinding (slab off)

E. Low Vision Aids

8. BASIC OCULAR MOTILITY

A. Extraocular Muscle Actions

B. Strabismus

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

C. Amblyopia Detection

D. Evaluation Assessment Methods

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

9. VISUAL FIELDS

A. Visual Pathways

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

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)
- Kinetic perimetry
- Static perimetry
- Automated (Humphrey, Octopus, Dicon, others)

E. Errors in Visual Field Testing

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

F. Visual Field Defects from Disease

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

10. CONTACT LENSES

A. Basic Principles

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

B. Fitting Procedures

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

C. Patient Instruction

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

D. Troubleshooting Problems

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

E. Verification of Lenses

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

11. INTERMEDIATE TONOMETRY

A. Aqueous Humor Dynamics

B. Glaucoma

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

C. Indentation

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

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

B. Fundus Photography

C. Defects/Artifacts

14. MICROBIOLOGY

A. Inflammatory Response

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

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 TONOMETRY

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

B. Etiology and Description of Less Common Defects

- Toxic
- Steep vs. sloping margins
- Absolute vs. relative
- Nasal steps
- Scotomata
- Altitudinal

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

D. Advanced Strabismus

- Convergence insufficiency/accommodative insufficiency
- Dissociated vertical deviation
- Syndromes and systemic manifestations
- Divergence excess/divergence insufficiency

20. ADVANCED PHOTOGRAPHY

A. Fluorescein Angiography

- Principle
- Photography technique and sequence
- Filters (exciter, barrier)
- Fluorescence
- Fluorescein administration

B. Slit Lamp

C. External

D. Specular Micrography

E. Film Processing

21. ADVANCED PHARMACOLOGY

A. Basic Concepts of Topical Medications

- Stability
- Sterility
- pH
- Adverse effects
- Tonicity

B. Mechanism of Action and Desired Effects

- Sympathomimetics
- Parasympatholytics
- Sympatholytics
- Cholinesterase inhibitors
- Parasympathomimetics

22. SPECIAL INSTRUMENTS AND TECHNIQUES

A. Ophthalmic Lasers

- Argon
- Excimer
- Krypton
- CO_2
- YAG
- 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
- Thyroid disease
- Other
- Hypertension
- Pituitary disease
- Atherosclerosis
- Brain tumors

B. Low Vision/Blindness

- Legal
- Psychological/social aspects
- Total
- Functional

C. Ocular Disease

- Infectious
- Malignant
- Immunologic
- Other
- Congenital

D. Trauma

Appendix C: New Content Outlines for the COA, CCOA, COT, and COMT Multiple-Choice Examinations

COA/CCOA exam updates in 2008
COMT exam updates in 2009
COT exam updates in 2010

Category Area	COA/CCOA	COT	COMT
Administrative and Clerical Duties	14%	6%	4%
Color Vision, Basic Skills, Pupil Function, History Taking	12%	15%	14%
Communication Skills	14%		5%
Contact Lenses	3%	4%	3%
Equipment Maintenance and Repair	3%	3%	3%
Medical Ethics and Legal Issues	7%	4%	
Microbiology and Pharmacology	6%	5%	3%
Ocular Motility	3%	5%	20%
Ophthalmic Patient Services	19%	14%	17%
Ophthalmic Photography	3%	3%	
Optics/Opticianry	5%	16%	16%
Specialized Ophthalmic Testing	3%	14%	12%
Tonometry	3%	6%	
Visual Fields	5%	5%	3%
Surgical Assisting in ASC or Hospital Based OR			

While the new percentage breakdown for each level of certification overlaps in many content areas, the type of information tested within each level is different.

Example: A COA candidate will receive ocular motility questions with a different difficulty level than COT or COMT candidates.

Appendix D: Content Outline for the Ophthalmic Surgical Assisting Examination

Ophthalmic surgical assisting candidates are examined in Content Areas A-H. Percentages indicate the percentage of total questions devoted to the content area.

A. Pre-operative Preparation of Patient (5%)
- Consent
- Intraoperative monitoring

B. Instruments (25%)
- Identification
- Selection/setup
- Maintenance
- Sterilization
- Sutures/supplies
- Function

C. Aseptic Technique (20%)
- Scrubbing/gowning/gloving/prepping
- Circulating
- General knowledge
- Assisting

D. Ophthalmic Anesthesia (5%)
- General
- Local
- Topical

E. Surgical Procedures (27%)
- Cataract surgery
- Corneal surgery
- Glaucoma surgery
- Strabismus surgery
- Oculo-plastics surgery
- Orbital surgery
- Lacrimal surgery
- Refractive surgery
- Retinal surgery
- Laser surgery
- Other

F. Surgical Complications (3%)

G. Ophthalmic Surgical Pharmacology (10%)
- Miotics
- Viscoelastics
- Enzymes
- Mydriatics
- Osmotic 9
- Narcotics
- Other

H. Minor Surgery (5%)
- Assisting the surgeon
- Instructing the patient