Expanded Scope of Practice supporting documentation

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Introduction

The Vermont Office of Professional Regulation (OPR) mission is to protect the public from incompetent or unethical practitioners through a system of licensure which VOA wholly supports. This includes statutory language stating, "Unprofessional conduct means: Performing treatments or providing services that a licensee is not qualified to perform or that are beyond the scope of the licensee's education, training, capabilities, experience, or scope of practice." **No scope expansion will change the obligation of the doctor to provide services that are within his or her capabilities.**

The Association of Schools and Colleges of Optometry (ASCO), American Board of Optometry (ABO) and American Optometric Association (AOA) have compiled a review of training in Ophthalmic surgery (See Appendix 2). This document provides the information that states have used to understand the U.S. landscape for the Optometry scope of practice and expansion.

We have pulled pieces from this document to provide a clear understanding of education, training, access, and highlight that Vermont scope of practice has fallen behind the education levels of Optometry. Vermont has much to offer newly graduated doctors. We strongly believe that the current scope of practice makes it hard to recruit new talent into our State compared to other states.

Doctor of Optometry Training in the U.S. Department of Veterans Affairs

The U.S. Department of Veterans Affairs (VA) is home to the largest optometric clinical education externship program in the U.S, as an adjunct to the education that takes place in clinics at optometry schools/colleges. Every year there are about 1,400 opportunities for Doctors of Optometry candidates to rotate at VA medical facilities for clinical education and training. Each year over 80 percent of the approximately 1,700 graduates of accredited schools and colleges of optometry have performed public health care services at the VA. All residents receive training in primary eye care and with VA's primarily geriatric patient population, the management of ocular disease is a significant portion of the training experience. In April 2020, the VA issued Directive 1899 affirming that Doctor of Optometry and others should practice to the full scope of their licensure and training. In August 2020, the VA rescinded Directive 1132, removing a previous ban that had prevented Doctor of Optometry from providing therapeutic laser eye procedures to veterans. As a result, optometric clinical education is expanding over time to ensure full scope training opportunities and better support the VA Optometry Service as it works to provide care for about 80% of veterans receiving eye care services annually, perform about 70 percent of the more than 3.4 million select ophthalmic procedures, and provide nearly 99 percent of vision rehabilitation services in low vision clinics and blind rehabilitation centers each year.

Scope Expansions U.S. Landscape

All states have updated their optometric practice acts over the years to some extent. States have begun to permit some, if not all the latest procedures being taught in optometry programs today. This has been allowed for years.

Scope of Optometric Practice in 2021

As scope of optometric practice in the U.S. continues to evolve, the term "ophthalmic surgery" is recommended as a description of skills that Doctors of Optometry should possess in order to meet the needs of their patient population adequately. These procedures may be routinely performed in the typical office of a Doctor of Optometry, as surgical procedures and the management of their possible complications fall within the established optometric curriculum, assessment tools, and documentation of ALL the Association of Schools and Colleges of Optometry institutions.

States currently have optometric practice acts which include in their scope the ability to perform ophthalmic surgery such as, but not limited to; injections of diagnostic and therapeutic pharmaceutical agents; drainage and/or removal of eyelid chalazia, cysts, abscesses, bullae and seroma; excision and biopsy of cutaneous lesions; repair of eyelid lacerations, and the use of radiofrequency and thermal cautery, use of lasers for limited treatment of Glaucoma and Narrow Angles.

States that allow Full Scope Ophthalmic Surgery:
Alaska, Arkansas, Kentucky, Louisiana, Mississippi, Oklahoma, Wyoming

States that allow Partial Scope Ophthalmic Surgical Procedures:
California, Colorado, Georgia, Idaho, Indiana, Iowa, Kansas, Montana, New Mexico, North Carolina, North Dakota, Oregon, Tennessee, Utah, Virginia, West Virginia

States that allow only injections:
Wisconsin

**Data is current as of January 2022*

ASCO: Framework for Developing Optometric Curriculum Guidelines and Educational Standards for Ophthalmic Surgery

ASCO has established general guidelines for all optometry schools/colleges to reflect the current state of ophthalmic surgery in 2021. For states that permit advanced procedures, optometry schools/colleges have submitted legal affidavits stating that their curriculums covered training these procedures. In some states, boards of optometry have required every school/college in the U.S. has been required to submit legal affidavits in order to license their graduates in these states.

Process

The framework draws substantially from the Accreditation Council for Graduate Medical Education (ACGME) core competencies, the ASCO 2011 "Attributes" Report, the ASCO Functional Standards for Optometric Education referenced during the admissions process at all schools and colleges of optometry, Accreditation Council on Optometric Education (ACOE) standards for the professional optometric degree, Northeastern State University Oklahoma College of Optometry (NSUOCO) Surgical Anatomy and Introduction to Office-based Surgery (OPT 7042) Course, and coursework of Southern College of Optometry, and the Illinois College of Optometry.

The framework does not specify an exact number of credit hours, contact hours, observations or performed procedures. Educational research over the past two decades has advanced our knowledge of learning and techniques best suited to facilitate learning. The strategies and methods recommended today are not limited to the strategies of the past, thanks to the emergence of new technology-based educational tools. Today's optometry training is providing a more valuable experience based on interaction and experimentation. Studies have demonstrated that authentic learning activities support the acquisition of knowledge that cultivates the kinds of skills that are lasting and more portable.

The three pillars for the core competencies for entry-level ophthalmic surgery includes Professional Values and Ethics, Knowledge, and Skill. Each core competency is accompanied by a list of suggested objectives which provide examples of activities to measure knowledge, skill, and outcomes. The framework is a starting point and is not meant as a prescriptive list of activities to restrict, limit, or regulate. In fact, the project team looks forward to broad engagement and discussion with stakeholders to facilitate implementation.

The "skills" competencies expand upon the entry-level student learning outcomes in the 2011 ASCO Attributes Report which include: "...the ability to prescribe or use ophthalmic materials, contact lenses, vision therapy, low vision devices, pharmaceuticals, and certain surgical procedures, to treat and otherwise manage common vision disorders and disease," and specific procedures utilizing injections, biopsy, excision, curettage, irrigation, ultraviolet radiation, radiofrequency and thermal cautery, to treat and manage vision disorders and disease.

Professional Values and Ethics

All Doctors of Optometry, like M.D.'s, are required to follow professional values and a code of ethics. Examples of those for Optometry; refer to optometric Oath as a practice guideline, demonstrate a commitment to fulfilling professional responsibilities, patient compassion, using quality improvement methods and implement changes with the goal of practice improvement, adhere to patient privacy and protection policies, employ evidence-based practices, participate in prescription drug monitoring systems.

Knowledge

Doctors of Optometry are expected to demonstrate and prove knowledge and application of many areas that most are unaware of. For example:

- Expected to demonstrate knowledge and application of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences to patient care.
    - Must demonstrate competence in their knowledge of basic and clinical sciences specific to optometry and ophthalmic surgery
    - Evidence-based medicine
    - Outcomes-based registries

- Able to implement appropriate infection control, cleaning, and sterilization protocols, as well as

biohazardous waste disposal procedures.

- Aseptic technique
- Awareness, implementation, and documentation of applicable OSHA requirements
- Personal protective equipment/barriers for patient and provider

- Expected to demonstrate an understanding of Applied Basic Sciences.
    - Integration and clinical application of anatomy, physiology, hemostasis, histopathology, and pathophysiology. Describe actions, mechanisms, and applications of relevant pharmacological and anesthetic effects on organ systems and adverse reactions
    - Familiarity with the principles of energy-tissue interactions including laser, visible ultraviolet and infrared light, electrocautery and radiofrequency sources

- Demonstrate knowledge of intra and postoperative complications and how to manage them.
    - Hemorrhaging
    - Infection
    - Intraocular hypertension
    - Inflammation
    - Anesthesia and anesthesia-related adverse events
    - Adverse pharmaceutical reactions including anaphylaxis
    - Wound healing complications
    - Other potential complications, relevant to the procedure

- Expected to understand ophthalmic surgical instrumentation, including its purpose, design, intended use, and related equipment and supplies.
    - Equipment for injection
    - Wound closure
    - Surgical instrumentation
    - Ophthalmic lasers
    - Radiosurgical technology
    - Personal protective equipment for providers and patients
    - Sterilization of surgical equipment
    - Asepsis and sterile field creation
    - Ancillary equipment and supplies

- Working knowledge of the laws and regulations relating to ophthalmic surgery.
    - Occupational Safety and Health Administration (OSHA)
    - State scopes of practice
    - Centers for Medicare and Medicaid Services (CMS)
    - Appropriate coding and billing practices
    - Accreditation and credentialing – e.g., Accreditation Council on Optometric Education (ACOE), American Board of Optometry (ABO), Joint Commission (surgery centers, and hospitals)
    - Stark and anti-kickback statutes

- Demonstrates an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.
    - Work effectively in various health care delivery settings and systems relevant to their clinical discipline
    - Coordinate patient care within the health care system relevant to their clinical discipline
    - Advocate for quality patient care and optimal patient care outcomes
    - Incorporate considerations of cost awareness and risk-benefit analysis inpatient and/or population-based care as appropriate
    - Work in inter-professional teams to enhance patient safety, care and improve quality
    - Participate in identifying system errors and implementing potential systems solutions

Skills & Requirements

- Ability to obtain an appropriate case history and proper informed consent
- Be able to properly document an ophthalmic surgical procedure report following the standards set by the JCAHO and AAAHC for sufficient information to:
    - Identify the patient
    - Support the diagnosis
    - Justify the treatment
    - Document the postoperative course and results
    - Promote continuity of care

- Appropriately evaluate and assess the ophthalmic and general medical indications and contraindications for ophthalmic surgery in order to obtain a valid informed consent, including alternatives, risks, benefits, and limitations or contraindications.

- Provide acute and long-term post-procedure care for ophthalmic surgery.
    - Management and/or treatment of adverse events
    - Maximizing procedural outcomes and systematic assessment for quality improvement
    - Sequelae of procedure complications
    - Wound healing
    - Medications
    - Necessity for further or ongoing intervention or consultation

- Manage acute and chronic complications which may be associated with ophthalmic surgery and anesthesia.
    - Supportive training (e.g., CPR, Basic Life Support)
    - Ability to manage early and late stage wound complications
    - Ability to identify and respond to intra and postoperative systemic complications.
    - Ability to utilize resuscitative equipment

- Expected to demonstrate the psychomotor skills and ASCO Functional Standards necessary to perform procedures safely and effectively.
    - Coordination and control of activity in free space and/or through magnification and illumination (e.g., manual dexterity, eye-hand coordination, and kinesthetic sense)

- Expected to demonstrate appropriate use, indication, and action of ophthalmic ultraviolet, visible, and infrared radiation LASER procedures
    - Trabeculoplasty
    - Post-cataract capsulotomy
    - Peripheral iridotomy
    - Refractive corneal modification for purposes of refractive changes

- Expected to demonstrate appropriate use, indication, and action of ophthalmic radiofrequency and thermal cautery procedures
    - Procedural hemostasis
    - Lesion removal

- Expected to demonstrate the psychomotor and cognitive skills necessary to perform nasolacrimal procedures
    - Punctal dilation and irrigation
    - Lacrimal probing
    - Punctal occlusion
    - Punctoplasty

- Expected to demonstrate the psychomotor and cognitive skills necessary to perform corneal procedures
    - Foreign body (FB) removal
    - Epithelial debridement
    - Emergent paracentesis
    - Cornea/Photorefractive Keratectomy
    - Cornea/Collagen cross-linking
    - Microstromal puncture

- Expected to demonstrate the psychomotor and cognitive skills necessary to perform conjunctival procedures
    - FB removal
    - Lymphatic cyst removal
    - Granuloma removal
    - Biopsy

- Expected to demonstrate the psychomotor and cognitive skills necessary to administer local and topical anesthesia effectively
    - Local anesthesia toxicity and management
    - Allergic reaction and anaphylaxis

    - Infiltrative local anesthesia
    - Regional anesthesia

- Expected to demonstrate the psychomotor and cognitive skills necessary to perform injection techniques effectively
    - Intradermal
    - Subcutaneous
    - Subconjunctival
    - Intralesional
    - Intramuscular
    - Venipuncture
    - Intraocular

- Expected to demonstrate the psychomotor and cognitive skills necessary to perform procedures on the lids and adnexa effectively
    - Suture techniques, including suture removal
    - Lesion excision, scalpel, scissors, dermablade, currette
    - Lesion incision and curettage
    - Cutaneous lesion biopsy
    - Intralesional injection
    - Lesion radiosurgical destruction
    - Laceration repair
    - Everting lid sutures for involutional entropion

- Expected to demonstrate effective, culturally competent, interpersonal communication skills, oral and written, that result in a clear understanding of health information by patients, their families, and health professionals which result in meaningful outcomes for the patient
    - Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
    - Communicate effectively with physicians, other health professionals, and health related agencies
    - Maintain comprehensive, timely, and legible electronic, or paper, health records, where applicable
    - Act in a consultative role to other physicians and health professionals
    - Work effectively as a member or leader of a health care team or other professional groups

Access and Cost

At first glance Ophthalmologists and Optometrists in Vermont appear to have a lot of overlapping geographical areas of coverage. The problem with this approach is that it does not take into consideration the sub specialization of Ophthalmology. Vermont has the following subspecialty surgeons: Cataract, Glaucoma, Retina, Pediatrics, Neuro-Ophthalmology, Oculoplastics. Depending on the subspecialty of each Ophthalmologist in

the State, many will not perform some or all the ophthalmic scope procedures under consideration, this severely limits the pool of surgeons for a given procedure. A simple count does not represent the reality in Vermont due to how rural most of our state is. Patients tend to request certain providers, regardless of wait times due to familiarity. There is no way to know the untold harm that delay in treatment may or may not cause.

State laws mandate reimbursement parody between Optometry and Ophthalmology. A patient who is seen by a Doctor of Optometry will need to cover the additional cost of a surgical consult either through the patient's insurance, or out of pocket, often a combination of both. This fee could be avoided by allowing trained providers to perform the service in office, saving costs to the healthcare system and to our patients.

Reimbursement parody does not exist when a patient is seen at a hospital or within a hospital affiliated provider. Patient cost goes up both in allowable reimbursement for the same fee, and occasionally through facility fees. Patients pay higher rates at hospitals and, depending on where they end up going, large facility fees. Allowing trained Doctors of Optometry to perform the requested scope procedures allows savings to the healthcare system and to patients.

Savings Associated with Scope Expansion

The American Optometric Association received a report from Avalon Health Economics which explores the main benefits of state optometric scope of practice expansion and provide a logical framework through which to assess the value of scope of practice expansion. The Cost-Benefit section provides a simple model to derive the monetary value of scope of practice expansion. It was determined that scope of practice expansion adds $600 million per year in transaction costs savings and another $4 billion per year in savings attributable to access-related improvements in health outcomes.

Safety

Currently, there are 24 states that have a higher scope of practice than Vermont. In these states there is no reliable data showing increased risk to patients from expanding optometric scope. The Vermont Optometric Association has argued that readily available statutorily mandated adverse event reporting data, as well as third party malpractice insurer rates are an effective argument on the safety of these procedures for the up to 20+ years they have been allowed in other states. We have provided in testimony, as well as to OPR, data from large malpractice insurers demonstrating no change in costs for States with higher levels of scope.

Education

About Doctor of Optometry Training and Education

Over a four-year period, professional post-baccalaureate education of students pursuing a Doctor of Optometry (O.D.) degree consists of classroom, laboratory, and clinical education, including a progressive clinical experience. This is similar to students pursuing an allopathic (M.D.) or osteopathic (D.O.) medical degree or Dental Medical Degree (DMD).

In the final two years, during rotation, M.D./D.O. students determine their specialty selection D.M.D./O.D. Students begin an immersive training period of doctorate-level health care

professional clinical study focused on their pre-chosen specialty. Optometry students focus on the eye, visual system, and associated systemic disease through classroom learning, laboratory exercises, and direct clinical care as like oral. At the end of the four years, optometry and dental students have the option of choosing a residency.

In addition to concentrations on the eye, visual system, and systemic health, optometry students, progress through basic medical sciences in educational and hands-on learning that includes:

- Histology, genetics, and biochemistry
- Human anatomy and physiology including whole body, head/neck, and eye
- Cell and molecular, biology, biochemistry, immunology, and pathology
- Microbiology, pharmacology, therapeutics, and pathology
- Neuroscience, with a concentration on the visual system
- Cardiovascular, respiratory, musculoskeletal, renal, gastrointestinal, and endocrine system anatomy, physiology, and cell biology
- Clinical medicine of systemic diseases and disorders
- Principles of evidence-based medicine.

Doctoral education also includes clinical education unique and specific to Doctor of Optometry in supporting their clinical care role and comprehensive approach to assessment. The curriculum includes demonstrated competency in the knowledge of:

- Geometric, physical, and ophthalmic optics
- Ocular anatomy, physiology, and biochemistry
- Pharmacology
- Ocular diseases and disorders; anterior, posterior, and other structural diseases and their evaluation, management, and treatment
- Neuroanatomy and neuro-ophthalmic disease
- Ocular manifestations of systemic diseases and disorders and their treatment
- Visual neurophysiology and perception
- Binocular/developmental vision, and pediatrics
- Geriatrics; chronic visual impairment; vision loss
- Contact lenses, including therapeutic, refractive, and diagnostic applications
- Ophthalmic Surgery and ocular disease co-management
- Injections, lasers, and advanced ocular techniques.

Doctor of Optometry Program Admission Requirements

Admission requirements for optometric education remain consistent with U.S. pre-medical school requirements. Pre-optometry students are included in undergraduate pre-medical and health professional advising and counseling programs to ensure successful completion of college requirements and planning for successful candidate matriculation into optometry schools and colleges while achieving their undergraduate bachelor's degree.

To successfully gain admission, required pre-optometry undergraduate didactic and laboratory coursework is extensive and covers a wide variety of advanced health, science, and mathematics courses, including general biology, general chemistry, organic chemistry, and physics. Additionally, optometry programs often require a host of associated coursework.

- Human Anatomy and Physiology
- Biochemistry
- Microbiology
- Genetics
- Calculus
- Psychology
- Biostatistics/statistics
- English
- Social science and other humanities.

Optometry Admission Test (OAT) and Other Standardized Exams

All schools and colleges of optometry accept the OAT. Many schools and colleges also accept the GRE, MCAT, DAT, or PCAT in lieu of the OAT. The OAT is a standardized examination designed to measure general academic ability and comprehension of scientific information. It consists of four subtests: Survey of the Natural Sciences (Biology, General Chemistry, and Organic Chemistry), Reading Comprehension, Physics, and Quantitative Reasoning. The OAT is scored on a 200- to 400-point scale in increments of 10. At least one year of college education is required prior to taking the OAT, but most students elect to complete two or more years of college-level coursework prior to taking the exam.

Accreditation

All optometry programs must meet extensive accreditation standards. As with other U.S. health care doctoral training programs, no person may be licensed to practice optometry in the United States unless they have graduated from an accredited school/college of optometry.

The Accreditation Council on Optometric Education (ACOE) is the only accrediting body for professional optometric degree (O.D.) programs, optometric residency programs and optometric technician programs in the United States and Canada.

ACOE is recognized as an accrediting body by two external agencies - the U.S. Department of Education (USDE) and the Council on Higher Education Accreditation (CHEA). Through periodic reviews by both USDE and CHEA, the ACOE demonstrates compliance with their respective criteria.

ACOE serves the public and the profession of optometry by establishing, maintaining, and applying standards to ensure the academic quality and continuous improvement of optometric education that reflect the contemporary practice of optometry. The scope of the ACOE encompasses professional optometric degree programs, optometric residency programs, and optometric technician programs. *In addition, schools/colleges are accredited by one of six regional organizations recognized by the United States Department of Education and the Council for Higher Education Accreditation.*

There are currently 23 U.S. optometry programs and two in Canada accredited by ACOE.

National Boards

All 50 states require successful completion of parts of the National Board of Examiners in Optometry prior to applying for state licensure to practice as a Doctor of Optometry in the U.S.

The National Board of Examiners in Optometry (N.B.E.O.) is the independent, not for profit testing organization that oversees and administers board testing for doctor of optometry in the continental U.S. and Puerto Rico.

Established in 1951, N.B.E.O.'s mission is "to serve the public and the profession of optometry by developing, administering, scoring, and reporting results of valid examinations that assess competence."

Part I (Applied Basic Science) is taken the spring of the third year, Part II (Patient Assessment and Management) is taken in December of the fourth year, and Part III (Clinical Skills) is taken any time during your fourth year.

Special National Examinations

Additional opportunities for examinations are accessible to Doctor of Optometry and include both laser and surgical procedures. These have been developed and administered based on evolving individual state licensure and advancing scope of practice requirements, and include:

- Treatment and Management of Ocular Disease (TMOD®)
- Advanced Competency in Medical Optometry (ACMO®)
- The Laser and Surgical Procedures Examination (LSPE™)
- Injections Skill Examination (ISE®)

Ophthalmic Procedures Endorsement - American Optometric Association Model Language

(a) Upon application, the board shall certify eligible licensees to perform advanced procedures as defined in this Subchapter if the applicant meets requirements set forth by the board, and

(i) The licensee shall demonstrate proof of licensure in good standing in the State of Vermont.

(ii) The licensee shall demonstrate proof of passage of the (1) Injections Skills and the (2) Laser and Surgical Procedures Examination administered by the National Board of Examiners or other accredited testing body/agency in Optometry, or a similarly rigorous examination administered by a school or college of optometry and approved by the Board of Optometry.

(iii) The licensee shall demonstrate satisfactory completion of a course of instruction approved by the board that may include:

(1) the following didactic classroom instructions:

(a) laser physics, hazards, and safety;
(b) biophysics of lasers;
(c) laser application on clinical optometry;
(d) laser tissue interactions;
(e) laser indications, contraindications, and potential complications;
(f) gonioscopy;

(g) laser therapy for open angle glaucoma;
(h) laser therapy for angle closure glaucoma;
(i) posterior capsulotomy;
(j) common complications: lids, lashes, lacrimal system;
(k) medicolegal aspects of anterior segment procedures;
(l) peripheral iridotomy;
(m) laser trabeculoplasty;
(n) minor surgical procedures;
(o) overview of surgical instruments, asepsis, and O.S.H.A.;
(p) surgical anatomy of the eyelids;
(q) emergency surgical procedures;
(r) chalazion management;
(s) epiluminescence microscopy;
(t) local anesthesia: techniques and complications;
(u) anaphylaxis and other office emergencies;
(v) radiofrequency surgery;
(w) post-operative wound care;

(2) The following in laboratory instruction
(a) Lab based Laser instruction on the following;
(i) Selective Laser Trabeculoplasty
(ii) Peripheral Laser Iridotomy
(iii) YAG capsulotomy
(b) Lab based Injection instruction on the following;
(i) Injections into the eyelid
(ii) Injections of the subconjunctival space
(iii) Intramuscular injection
(iv) Subcutaneous injections
(v) Intravenous injections
(vi) Intralesional injections
(c) Lab based surgical instruction on the following;
(i) Management of lid lesions.

(3) In vivo instruction for each procedure by an Ophthalmologist or Optometrist who is currently licensed to perform these procedures.

(4) A board approved course of instruction shall be:
(a) provided by an accredited optometry, osteopathy or medical school;
(b) a minimum of 32 clock hours in length;

(iv) Beginning with the graduating class of 2020 any optometrist who provides proof that he/she graduated from an optometry school whose program includes all of the training and testing requirements established by the board may be deemed to have met the requirements

for certification outlined in section (III) to perform authorized ophthalmic surgery procedures.

(v) The board may waive any of the above requirements for an applicant optometrist who is licensed and currently in good standing in a United States jurisdiction having license requirements that are substantially equivalent to the requirements of this chapter.

(b) An Optometrist licensed under this chapter who possesses the endorsement shall be able to perform the following advanced procedures.

(i) Anterior segment laser procedures
- (1) Selective Laser Trabeculoplasty
- (2) Peripheral Laser Iridotomy
- (3) Peripheral Laser Iridoplasty
- (4) YAG capsulotomy

(ii) Injections
- (1) Injections applicable to the diagnostic care or treatment of the eye and its adnexa.

(iii) Eyelid Surgical Procedures
- (1) Removal of benign eyelid and eye growths
- (2) Chalazion Excision

(iv) Other procedures as defined by the Board provided that they are
- (1) not on the prohibited list of procedures
- (2) taught at a recognized school or college of optometry.

(c) The following ophthalmic surgery procedures are excluded from the practice of optometry, except for the preoperative and postoperative care of these procedures: (i)The following procedures:
- (a) Retina laser procedures.
- (b) Penetrating keratoplasty or corneal transplant.
- (c) The administration of general anesthesia
- (d) Surgery done with general anesthesia

(ii) The following non-laser surgical procedures:
- (a) Surgery related to removal of the eye from a living human being.
- (b) Surgery requiring full thickness incision or excision of the cornea or sclera, excluding anterior chamber paracentesis to reduce intraocular pressure in patients with acute closed-angle glaucoma.
- (c) Surgery requiring incision of the iris and ciliary body, including diathermy or cryotherapy
- (d) Surgery requiring incision of the vitreous.
- (e) Surgery requiring incision of the retina.
- (f) Surgical extraction of the crystalline lens.
- (g) Surgical intraocular implants.

(h) Incisional or excisional surgery of the extraocular muscles.
(i) Surgery of the eyelid for suspect malignancies or for incisional cosmetic or mechanical repair of blepharochalasis, ptosis, and tarsorrhaphy.
(j) Surgery of the bony orbit, including orbital implants.
(k) Incisional or excisional surgery of the lacrimal system other than probing or related procedures.
(l) Surgery requiring full thickness conjunctivoplasty with graft or flap.
(m)Pterygium surgery.

(d) Prohibitions

(1) Performing authorized ophthalmic surgery procedures without endorsement based upon the education requirements outlined in this subchapter shall be grounds for suspension or revocation of an optometry license and/or credentialing to perform authorized advanced procedures.

(2) Performance of authorized ophthalmic surgery procedures by any person without a valid and current endorsement issued by the board to perform such procedures shall be considered a violation of Subchapter 4.

Doctor of Optometry Degree

Upon successful completion of optometry program requirements, candidates graduate from their accredited schools/colleges of optometry having earned and granted the degree, Doctor of Optometry (O.D.). Doctor of Optometry are then eligible to apply for and take state licensure examinations. Individual state boards of optometry, as independent public agencies, determine requirements for licensure to meet state scope of practice guidelines.

Doctor of Optometry can choose to participate in additional one-year post-graduate residency training programs following graduation from optometry school/college. This experience offers Doctor of Optometry focused training in a clinical area of optometric care such as pediatric optometry, primary care, cornea and contact lens, vision rehabilitation, and ocular disease.

The Doctor of Optometry Curriculum in Detail

While the sequence of course work varies from one program to another, some general characteristics are shared by all.

In the first and second year of the professional program, course work is concentrated in the basic and biomedical sciences (anatomy, physiology, pathology, biochemistry, pharmacology, and public health, optics, and vision science). These serve as the foundational underpinnings for clinical knowledge and application in the patient care setting. For example, the courses for anatomy and physiology are provided because they provide the required foundations necessary for surgical procedures. Furthermore, the course for physical optics is provided because this course provides the foundational knowledge to understand the properties of lasers. Patient care experience is incorporated with an increasing level of responsibility and increasing student learning expectations, culminating in a 12-month final year comprised entirely of direct patient care in a variety of clinical settings.

Typically, direct patient care experiences begin early in the curriculum. Students begin their clinical experience in pre-clinical skills laboratories with virtual reality simulators and classmates serving as

patients in the first year, and then proceed to clinical training with real patients. This training includes obtaining full medical case histories, performing examinations, learning diagnostic and surgical techniques, and discussing treatment options and plans. As the curriculum progresses, students spend part of their time in the classroom and part of their time in the clinic examining, diagnosing, and treating patients with acute and chronic eye diseases. The final year is entirely clinical training where clinicians are supervised one-on-one with an attending optometric physician, which includes off-campus clinical externship rotations. Sites for external rotations are available in the United States and abroad. Clinic settings include military facilities, Veteran's Affairs (VA) hospitals, public health service hospitals, community health centers, and various specialty and private practices. The lengths of the external rotations vary from eight to sixteen weeks.

Sample Curriculum

Here are some sample course descriptions, these particularly focus on courses relating to advanced procedures or ophthalmic surgery. Full information on every institution's curriculum and course descriptions are available to the public on the individual schools/colleges' websites. Additional information is available via ASCO website at optometriceducation.org.

The Ohio State University School of Optometry

In addition to basic systemic anatomy, physiology, pathology, and pharmacology coursework, our students also extensively study the structure, function, and pathology of the eye and orbit. Noteworthy, this coursework is not taken by any medical student. Relevant highlights of our curriculum include:

- A detailed course in ocular anatomy with both didactic and hands-on laboratory inspection and dissection of the globe, histological examination of all ocular tissue, and examination of all nervous and vascular supply to the orbit. This course covers a complete tissue study of every layer and tissue of the lids, conjunctiva, and globe in addition to the anatomy of the orbit. This course comprises 50 hours of didactic lecture and 30 hours of hands-on laboratory work.

- A detailed course in the physiology of the eye and orbit. This course covers all fluid dynamics of the globe, detail on all immunological and inflammatory mechanisms of ocular trauma, and a discussion of blood flow, lymphatic drainage, neural control, etc. This course comprises 50 hours of didactic coursework.

- An extensive course in the optical structures of the eye discussing in detail the exact thicknesses, curvatures, changes of these structures over lifetime, measurements of these structures using instrumentation and interpretation of these images. This course is comprised 50 hours of didactic lecture and 30 hours of laboratory hands-on work.

- A 28-hour course in the understanding of lasers and ionizing radiation and its interaction with human tissue. A 50-hour course in the clinical use of optical instruments such as slit lamp biomicroscopes, fundoscopy lenses, etc. with extensive training and practice in the precise use of these instruments and practical examinations ensuring that every student is proficient in the precise visualization and clinical interpretation of the health/pathology of each layer of the eye.

- An extensive clinical rotation in which our students conduct complete vision examinations

on patients under the direct supervision of licensed attending optometrists. These examinations typically include complete slit lamp biomicroscopic examinations of the eye and adnexa of each patient, thereby ensuring excellent skills in these procedures, e.g., examination and clinical interpretation of ocular tissues and treatment and management of inflammation and infection of any part of the visual system. At Ohio State each student currently completes approximately 1700 full eye examinations before graduation.

- A 30-hour course in direct training (didactic and hands-on laboratory) in the area of lasers, injections, and advanced procedures that has been approved by all states with advanced optometric scope as meeting the needed didactic and hand on procedures for licensure in those states.

- A 17-week (40 hours per week) rotation in their fourth year in an ophthalmology office or surgical co-management site where students work directly with ophthalmologists in pre- and post-surgical care, thereby learning the diagnosis and treatment of complications of ophthalmic surgery, surgical candidate selection and observation of surgical procedures.

Western University of Health Sciences College of Optometry

A composite list of relevant topics is summarized; relevant content may be introduced in one course in the curriculum and reinforced in another, which may reach a higher level in another course in the curriculum. These may be applied in a subsequent course in the curriculum and may not be readily evident that all the important content is embedded within our curriculum simply upon review of the course descriptions.

- laser physics, hazards, and safety
- biophysics of lasers
- laser application on clinical optometry
- laser tissue interactions;
- laser indications, contraindications, and potential complications
- gonioscopy
- laser therapy for open angle glaucoma
- laser therapy for angle closure glaucoma
- posterior capsulotomy
- common complications: lids, lashes, lacrimal system
- medicolegal aspects of anterior segment procedures
- peripheral iridotomy
- laser trabeculoplasty
- minor surgical procedures
- overview of surgical instruments, asepsis
- surgical anatomy of the eyelids
- emergency surgical procedures
- chalazion management
- local anesthesia: techniques and complications.

OPTM 8120 Principles and Practices of Optometry VI: Laser Eye Procedures and Minor Surgical Eye Care (2.0 credit hours)
This course covers the uses of lasers to perform certain surgical eye procedures, including laser therapies for open angle glaucoma, for angle closure glaucoma, and for posterior capsulotomy. The course will include a review of laser biophysics, laser-tissue interactions, as well as contraindications and complications associated with laser procedures on ocular tissues. This course will also cover surgical preparation and management of lid and adnexal lesions with an emphasis on benign neoplasms and chalazion. Additional topics include medicolegal aspects of surgical eye care and postoperative wound care. The lab portion of the course will provide hands on experience in suturing techniques and ophthalmic laser operations.

OPTM 8021 Principles and Practice of Optometry V: Special Procedures (2.0 credit hours)
This course will cover the theory and methods of clinical techniques that build upon basic examination skills acquired during the courses Principles and Practice of Optometry I through IV. Clinical techniques including scleral depression, A- and B-scan ultrasonography, punctual occlusion, punctal dilation and irrigation, removal of foreign bodies from the cornea and conjunctiva, and the injection techniques of IM, SubQ and IV will be presented in a hands-on format. The course will include non-glaucoma visual fields and applications of significant optometric thought processing.

OPTM 6175 Ocular Disease: Diagnosis and Treatment of the Posterior Segment (4.0 credit hours)
This course builds upon the framework presented in the Principles and Practice of Optometry curricular track to present advanced concepts in ocular disease management. The anatomical, physiological, histological, and pathological processes of ocular disease will be emphasized. Topics include in-depth discussion of diseases and abnormalities of the vitreous and retina as well as vitreo-retinal pathology associated with systemic diseases.

OPTM 6073 Ocular Disease: Diagnosis and Treatment of Glaucoma (2.5 credit hours)
This course covers the pathophysiology, diagnosis, treatment, and management of patients with all forms of glaucoma, with an emphasis on evidence-based therapeutic interventions. The course includes technique and interpretation of visual fields for glaucoma diagnosis and management. Topical and systemic medical therapies will be emphasized. The course will also discuss current surgical management of various forms of glaucoma.

OPTM 6053 Optical Science: Physical Optics (3.0 credit hours)
This course presents the physics of light, including the wave and particle behavior of light. In particular, the course will include the characteristics of electromagnetic radiation, wave motion, total and partial coherence of light, interference, diffraction (single slit, double slit, gratings, circular apertures), zone plates, polarization, birefringence, anti-reflective lens coatings, lasers, emission and absorption spectra. Examples of applications in vision science and ocular diagnostic instruments will be provided.

OPTM 5133 Systemic Pharmacology (2.0 credit hours)
This course will cover medications commonly prescribed for systemic conditions, their indications and mode of action, as well as their ocular and visual side effects and toxicities.

Topics include pharmacodynamics, pharmacokinetic aspects of drug formulations, routes of administration, and dosing & elimination, with an emphasis on drug indications, mechanisms of action, adverse effects, drug interactions, and contraindications. Additionally, a review of the pathophysiology of systemic diseases as it relates to current drug treatment paradigms will reinforce the connection between the medications and their corresponding indications.

OPTM 5130 Ocular Physiology (3.0 credit hours)

This course presents in depth coverage of the physiology of the eye, adnexa and visual systems. Topics include the physiology of the eyelids, lacrimal gland and its apparatus, tear production, cornea and lens, ocular fluid dynamics, vitreous body, retina, choroid and optic nerve. Topics of visual function and nutrition related to development and normal ocular function will be covered. When possible, relevant comparisons to disease states will be discussed to show the clinical relevance of the physiological concepts. The topics related to visual function includes, visual acuity, color vision, contrast sensitivity function, in health and disease states, accommodation function and decline in accommodation function with aging and presbyopic changes.

OPTM 5041 Anatomy for the Optometrist (4.0 credit hours)

This course covers all aspects of anatomy relevant to the practice of Optometry. Course content covers broad aspects of gross anatomy. Ocular anatomy is covered in detail including adnexa, orbit, orbital content, structure, and functional relationship of various ocular structures and their clinical importance. Through lectures and laboratory exercises students are introduced to the anatomy of the head and neck and neuroanatomy. Particular attention is paid to the cranial nerves, both their normal function and the numerous clinical syndromes that affect them as they pertain to optometric practice.

Sample topical outlines for selected content areas relevant to expanded scope of practice ***[selected courses only]*** In the following section, some samples of topical outlines are provided. These outlines go beyond the course descriptions to provide another layer of detail to elaborate on the curricular content more fully. The samples do not represent the entirety of the course content, and merely provide a portion of the content that is particularly relevant to demonstrating the education and training in support of expanded scope of practice.

OPTM 8120 Sample Topics

- Cataract surgery in Review
- IOL calculations and IOL types (premium IOLs)
- Femtosecond Laser-Assisted Cataract Surgery (FLACS)
- Post-op cataract complications
- LASIK in Review
- Post-op LASIK complications
- Innovations in corneal refractive procedures SMILE procedure
- Safety overview for minor surgical procedures: indications, surgical procedures. Instrumentation, anesthesia, asepsis & OSHA, medicolegal aspects, management of anaphylaxis & other complications
- Laser glaucoma procedures
- Gonioscopy review & ALT/SLT procedures
- YAG posterior capsulotomy

- Peripheral Iridectomy (PI)
- YAG cap, PI, ALT laser procedures (3-hr lab with proficiency)
- Minor corneal procedures: FB removal, amniotic membranes
- Corneal FB removal, lid speculum, pressure patch, amniotic membrane (2-hr lab with proficiency)
- Basic lid procedures e.g. chalazion, benign lesions
- Oculoplastic Procedures
- Glaucoma surgeries e.g. MIGS, trabs, tubes Retinal laser procedures e.g. PRP, macular grid Surgical Retinal Procedures
- Suturing and subdermal injections (2-hr lab with proficiency)

OPTM 8021 Sample Topics

- Injections
- Reclined BIO
- Scleral Depression BIO 3-Mirror Fundus Ocular Foreign Bodies Punctal Plugs
- Dilation & Irrigation
- Cataract Surgical Procedures
- Anterior Segment OCT Refractive Surgeries
- Fundus Auto Fluorescence Sample Assessments
- Demonstrate ability to perform the complete process of injections for IM
- Demonstrate ability to perform the complete process of injections for IV
- Perform complete process of specialty testing suite including Interpretation and Report
- Integrate specialty fundus exam techniques (scleral depression BIO and 3-Mirror fundus lens) suitably into ocular health evaluation
- Examine angles with four mirror lens
- Discuss the processes and procedures of ocular cataract surgeries
- Discuss the processes and procedures of corneal refractive surgeries
- Demonstrate ability to perform Anterior Segment OCT
- Examine the retina using FAF
- Perform the sequence of managing corneal foreign bodies
- Complete process of ultrasonography
- Safely implement punctal health procedures of dilation/irrigation and plugs

OPTM 6053 Sample Topics

- Laser Theory and Clinical Laser Applications
- Spontaneous emission
- Stimulated emission
- Three-level ruby laser
- Brewster windows
- Laser types
- Helium Neon laser
- Pulsed laser
- Mode locking

- Q-switching
- Lasers in eye care
- Laser tissue interaction
- Photocoagulation
- Photoablation
- Photodisruption

OPTM 6073 Sample Topics

- Surgical management
- Laser options
- Types of surgeries
- MIGS
- Consideration in selection of procedures
- Transitioning from medical to surgical options
- Future developments
- Anaphylaxis and other office emergencies
- Post-operative wound care

University of Alabama at Birmingham School of Optometry

The fundamental curricular contents required for advanced procedures, including ophthalmic laser surgical procedures, injections, and minor surgical procedures, are woven into the UAB School of Optometry curriculum from the 1st year of school and into the 4th, and include systemic and ocular anatomy, physiology, microbiology, pathology, biochemistry, pharmacology, management for conditions in eye care – with over 1000 hours of didactic and laboratory contact time for each student not including clinical encounters through clinical/patient care. In the first and second year of the program, optometry students take the same systemic curriculum as the dental students and medical students (Fundamentals in Health Sciences, Neuroscience, Gross Anatomy, Cardiovascular, Respiratory, Gastrointestinal, Musculoskeletal/Skin, Hematology, Endocrine, and Renal Systems) which was the design of the medical optometry curriculum from its inception in 1969.

2019-20	CONTACT HOURS
FUNDAMENTALS I	92
CLINICAL OPTICS	96
OCULAR ANATOMY	64
PHYSIOLOGY	64
BIOCHEM	24
FUNDAMENTALS II	92
SYSTEMS	290
OCULAR MICRO	16
VISUAL OPTICS	96
CEVS III (SLE, BIO, GONIO)	152
PHARM	64

ANT SEG	96
POST SEG	56
GLAUCOMA	24
NEURO	32
CLINICAL MANAGEMENT	48
TOTAL RELATED	1306
INJECTIONS MSP	48
LASERS	16.5
TOTAL RELATED	64.5

To ensure that students can apply fundamental concepts clinically, and perform surgical procedures, there are two required, stand-alone courses for injections/minor surgical procedures and ophthalmic lasers (OPT 326 and OPT 323) and have been since 2008 and 2012 respectively. These two courses account for an additional 46 contact hours. OPT 326 and OPT 323 were designed based on the broadest scope of optometric practice and utilize standardized high fidelity model-based practices to ensure safety and essential skills. The courses do not simply teach technical skills, but cover anatomy, pharmacology, clinical application, indications, contraindications, and management of potential complications. Furthermore, faculty for the OPT326 and OPT 323 courses are only those who are certified in the surgical procedures.

Northeastern State University Oklahoma College of Optometry

Select Course Descriptions – NSU Courses with Surgical and Laser Correlates

5103 General Pharmacology
General principles of drug action and specific systemic treatment. Mechanisms of action and therapeutic guidelines for: autonomic drugs, anti-infective agents including those used for prophylaxis pre- and post-operatively, anti-inflammatory agents, agents used in the treatment of allergy, major drugs acting on the CNS, cardiovascular, kidney, and endocrine systems, agents used for local or infiltrative anesthesia and analgesia relevant to office-based procedures, antiseptic agents and common over-the-counter drugs. Adverse side effects and drug interaction of commonly prescribed pharmaceuticals.

4126 Geometric and Physical Optics
Imaging of light: ray tracing through optical systems; aberrations and optical systems design. Physics of light: sources, spectra, scatter, polarization, refraction, reflection, absorption, interference, diffraction. Theory behind diagnostic and therapeutic ophthalmic lasers. Lecture and laboratory.

4271 Interpersonal Communications
Interpersonal and interprofessional relationships. Creating and enhancing a professional image; communicating with patients; interpreting patient complaints and concerns; enhancement of patient understanding and compliance; interviewing and history taking techniques; referrals; surgical co-management; dealing with difficult patients.

5203 Ocular Pharmacology
Principles of ocular pharmacology and medical treatment, clinical administration of oral, topical, and injectable drugs and utilization of diagnostic agents in the clinical/surgical care of the eye and adnexa. Principles and specific management
and treatment of ocular disease, trauma, anterior segment surgery, and laser
treatment/surgery by systemic, local, and topical therapy, including antisepsis. Clinician responsibility in the treatment and management of ocular and systemic complications of pharmaceutical use.

4133 Clinical Immunology and Microbiology
A study of the cellular and biochemical aspects of the human immune system and the immune response to infectious disease. Abnormal immune responses will be discussed. Lectures will also cover microbial aspects of infectious diseases (including postoperative infections) caused by bacteria, viruses, fungi and parasites, with emphasis on pathogenic mechanisms, host-pathogen interaction and antimicrobial therapy.

7101 Systemic Therapy in Ocular Disease and Trauma
Basic systemic therapy in ocular disease. Clinical indications, dosage, drug interactions, and common complications of enteral and parenteral medications utilized in ocular disease. Management of surgical post-operative complications with systemic medications.

7132 Differential Diagnosis of Ocular Disease and Trauma
A review of ocular disease, including eyelid lesions, and trauma with emphasis on
clinical presentation, adjunctive testing, differential diagnosis as well as treatment with oral agents, topical agents, office-based surgical procedures and therapeutic lasers.

6223 Strabismus and Amblyopia
Basic principles of strabismus and amblyopia. This will include the symptoms, signs, diagnosis, test administration, test data analysis and therapy with lenses/prisms, vision therapy, and surgical options including procedures, referral criteria and outcomes. Lecture and laboratory.

5183 Optometric Clinical Methods III
This course emphasizes instrumentation and procedures for the detection, diagnosis, and management of pathological conditions. Includes introduction to office-based surgical procedures. Credit will not be awarded for Optometry 5183 until the pre-clinical examination has been completed successfully. Lecture and laboratory.

4213 The Human Nervous System
Structure and function of the central, peripheral, and autonomic nervous systems
including anatomic correlates to periocular sensory anesthesia. Particular emphasis is placed on the anatomy and physiology of the visual system as it applies to the
processing of visual information. Lecture and laboratory.

6081 Optometric Case Studies I
Case presentation and a discussion of selected topics in optometric clinical care
including optometric surgical and laser procedures by faculty, students, and invited

speakers. Current literature will be explored which applies to the subjects under discussion.

6251 Optometric Case Studies II
Case presentation and a discussion of selected topics including optometric surgical and laser procedures in optometric clinical care by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

7081 Optometric Case Studies III
Case presentation and a discussion of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

7171 Optometric Case Studies IV
Case presentations and discussions of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

5273 Ocular Disease I:
Cataracts, Corneal, and External Ocular Disease Epidemiology, pathophysiology, differential diagnosis, management, and treatment of cataract, corneal and external ocular diseases, including disorders of the crystalline lens, eyelids, lacrimal system, conjunctiva, cornea, sclera and episclera. Includes cataract pre-operative and post-operative care as well as indications for treatment of posterior capsular haze with the Nd:YAG laser. Also includes instruction of office-based surgical procedures for the treatment and relief of ocular abnormalities.

5291 Clinical Practice I
Performance of clinical procedures and observation with case discussion. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes observing and assisting faculty, residents and upper-class students with office-based minor surgical procedures, including anterior segment laser procedures.

6093 Clinical Practice II
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office based surgical procedures, including anterior segment laser procedures.

6195 Clinical Practice III
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office based surgical procedures, including anterior segment laser procedures.

6295 Clinical Practice IV
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, including anterior segment laser procedures.

7095 Clinical Practice V
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

7196 Clinical Practice VI
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

7293 Clinical Practice VII
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems in on- and off-campus clinics. Optometric examinations conducted under the supervision of clinical and adjunct faculty within clinical, private practice and hospital settings. Includes performance of office-based surgical procedures, biopsy, and anterior segment laser procedures.

6231 Optometric Clinical Methods IV
Course topics covered include instrumentation and technical skills necessary for surgical procedures performed in the primary eye care setting. Includes OSHA regulations pertaining to blood borne pathogens. Included techniques are asepsis, iv injections, fluorescein angiography, management of anaphylaxis, wound management, basic suturing, and in-office minor surgical procedures. The course discusses the indications for, alternatives to, and risk/benefits of all techniques, as well as the management of complications. The course includes lecture and hands on participation.

4264 Ocular Anatomy and Physiology
Gross and microscopic anatomy of the orbit and its contents including the globe, muscles, bone structure, blood and nerve supplies; embryology, histology, anatomy and physiology of the eye including the chemical composition, metabolic activities; physiological functions of the various tissues of the eye and related structures including sensory and motor innervation of the face and biomechanics of the eyelid as relevant to office-based eyelid surgical procedures. Lecture and laboratory.

7042 Office–Based Surgery

The role of office-based surgical practice within the comprehensive scope of current optometric practice. Application of evidence-based medicine and basic science human anatomy to office- based surgical patient selection, planning, instrumentation, procedures, anesthesia, and pre- and post-operative care.

7031 Ophthalmic Applications of Lasers
Laser biophysics, hazards, safety precautions, indications and contraindications for specific procedures, performance of the procedures, and follow-up care including management of complications are reviewed.

University of Pikeville, Kentucky College of Optometry

OPT 715 Advanced Topics in Ocular Disease Management
This course is a continuation of OPT 628. It includes discussion of advanced procedures and recent discoveries pertaining to the detection, diagnosis and management of posterior segment disorders.

OPT 716 Glaucoma Diagnosis & Management
This course is a comprehensive presentation of primary and secondary glaucomas, including etiology, mechanisms, prevalence and classification. The course emphasizes diagnostic testing including the use of advanced technologies, imaging procedures, photographic techniques and management options including medical, surgical and laser procedures.

OPT 717 Inter-Professional Clinical Case Analysis & Management
Clinical cases involving multidisciplinary involvement will be presented. Participation will include discussion by physicians, nurses, pharmacists, social workers, public health personnel, and other professional personnel as well as optometrists to exemplify and provide proper sequential and/or parallel management and arrive at an integrated approach in solving the patient's issues.

OPT 722 Epidemiology and Research Methodology Epidemiology
Discusses the factors that concern the frequency of occurrence of certain eye diseases or conditions among a defined population, particularly rural areas of Appalachia and other rural areas in America, and their effect on the health and well-being of their patients. It discusses screening, standards of care and reviews major epidemiological eye studies together with those determinants that contribute to ocular diseases and conditions in aging and poverty. Other topics include those factors that contribute to or worsen the effect of visual impairment such as pharmacological factors or cognitive impairment in the aged population or psychological factors in the young. There is also a detailed analysis of health care policy. Research Methodology covers development of a research question, experimental design, specific aims and statistical analysis, writing of the research proposal, grant applications, regulatory requirements related to human subject and animal research, CITI and other mandatory training for carrying out research and clinical trials, presentation of papers and posters and publication in refereed journals.

OPT 723 Clinical Internship IV
The student continues supervised clinical patient care with emphasis on the intern delivering care in the role of the provider. Asin Clinical Internship III, care is supervised by KYCO clinical faculty and will take place mainly in the KYCO primary care clinics within the College and at one or more

KYCO network clinics. Case conferences and Grand Rounds experiences will be assigned. Emphasis is upon correct interpretation and management of refractive and disease cases that have moderate complexity.

OPT 725 Neuro-Ophthalmic Disease, Neurological Disorders & Acquired Brain Injury
This course provides an in-depth discussion of the diagnosis of and management strategies for various neurological disorders that can affect vision and visual perception. Other systemic conditions such as some of vascular or cardiac etiologies or space-occupying lesions of the brain may also contribute to visual abnormalities or loss. Testing and neurological evaluation is discussed in depth and is accompanied by various radiological and other technologies that help the diagnostic process. The diagnostic strategies for the confirmation of acquired brain injuries are also covered in detail.

OPT 726 Clinical Medicine & Systemic Disease: Management & Co-Management
This course covers the major systemic diseases that have ocular and visual implications and reviews their etiology as discussed in pathology, the patient's signs and symptoms and other clinical assessments to not only reach a definitive diagnosis but also develop effective management plans. Since many systemic diseases have ocular correlates or implications, management often takes the form of co-management. The course will emphasize certain diseases such as diabetes, cardiovascular disorders, infectious and other conditions prevalent in the general and Appalachian populations.

OPT 727 Ophthalmic Surgery I: Laser Procedures
This course provides instruction and laboratory experience in advanced ocular therapeutic laser procedures. Topics will include a review of laser physics, tissue interaction, laser hazards and safety, and laser treatment protocol. As part of this course, students will perform simulated laser treatments as well as receive instruction for providing pre- and post-operative patient care in preparation for the clinical application of these procedures.

OPT 728 Optometry Review I
This course will review basic concepts focusing on the content presented in past and ongoing courses coordinated with the matrix outlined by the National Board of Optometry and the Accreditation Committee on Optometric Education. Targeted topics include principles of optics, general and ocular pharmacology and pharmacogenetics, and systemic and ocular disease. The goal of the course is to help participants prepare for their national board and state licensure exams, driving the course content.

OPT 731 Pre & Post-Operative Management of Ophthalmic Surgery Patients
This course presents the evaluation and management, including surgical decision-making in the care of the pre-operative candidate patient for ophthalmic surgery. All pre-surgical testing, counselling and preparation of the patient is presented as are the post-operative procedures, medications, and device management.

OPT 732 Advances in Optometry & Ocular Imaging
This seminar course is intended for presentations on contemporary and future innovations in the practice of optometry from the development of new technologies and instrumentation, to better management strategies, research in pharmacogenetics, detection of markers predictive of disease,

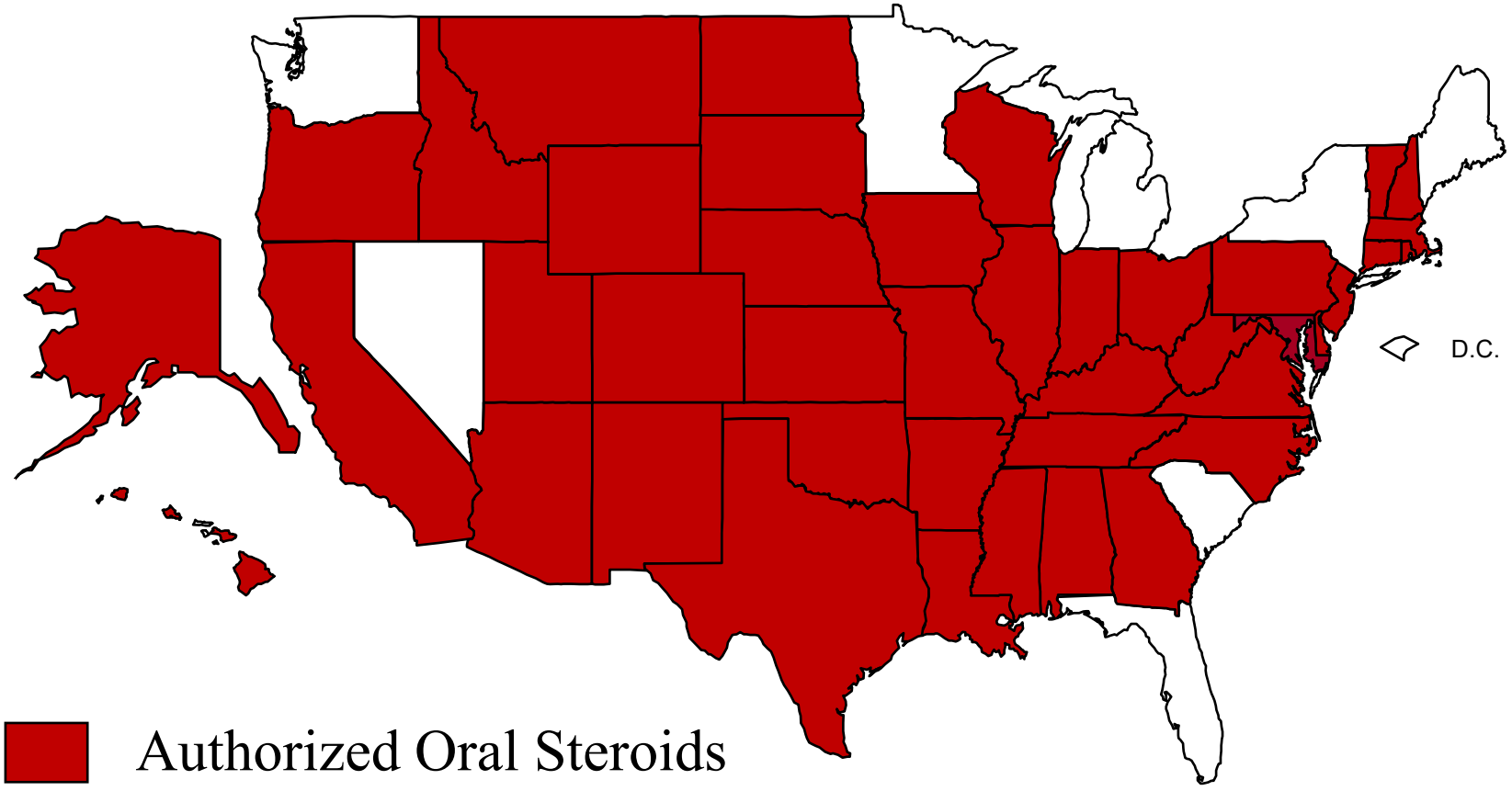
pharmaceutical discoveries, and better optical solutions to current refractive disorders. A wide array of advanced corneal and refractive imaging systems devices will also be introduced.

OPT 733 Clinical Internship V
Continuing supervised clinical patients care with emphasis upon the intern delivering care in the role of the provider. Care will be supervised by KYCO clinical faculty and will take place mainly in the KYCO primary eye care clinics within the College and at one or more KYCO network clinics. Case conferences and grand round experiences will be assigned. Emphasis is upon correct interpretation and management of refractive and disease cases that have high complexity.

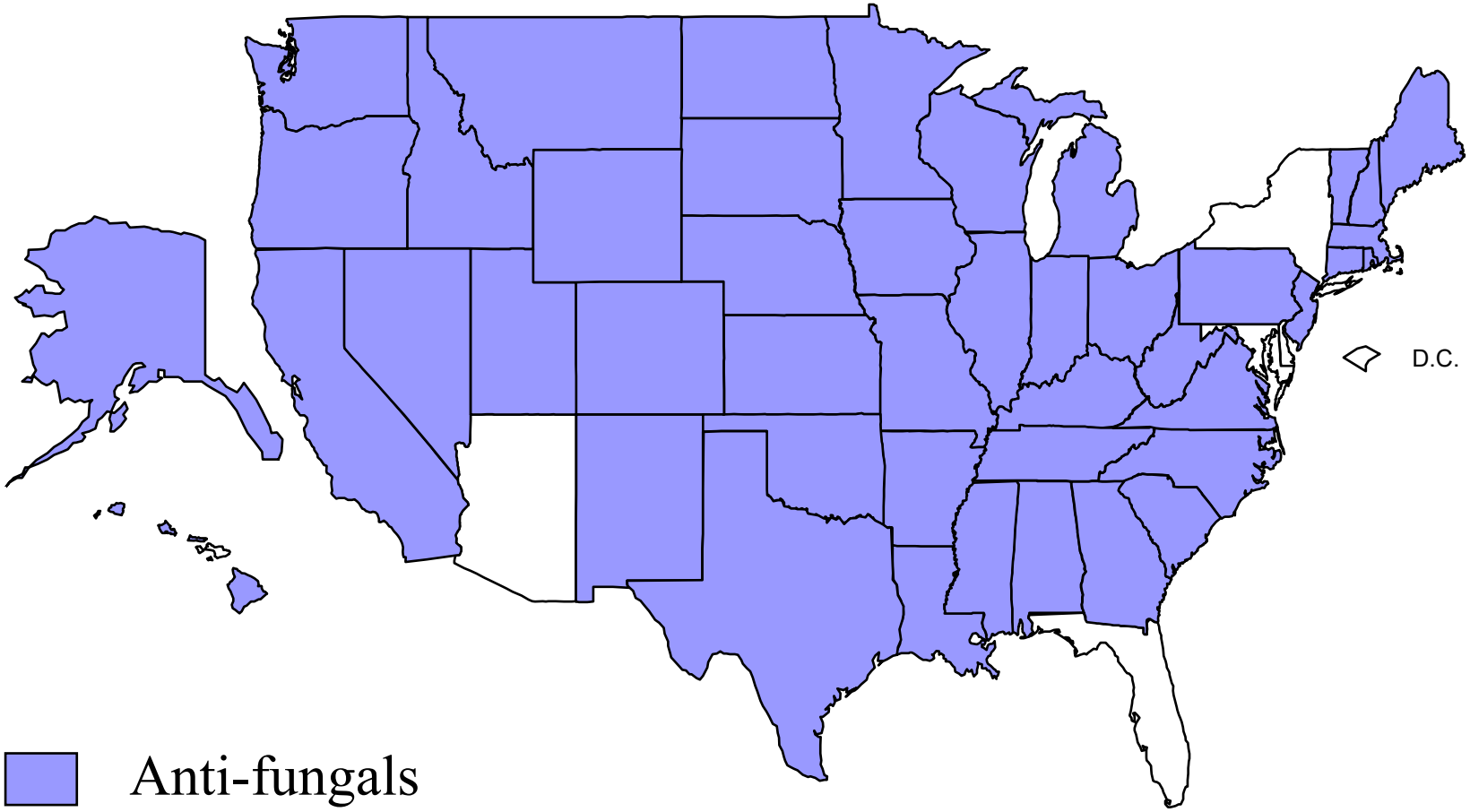
OPT 735 Ophthalmic Surgery II: Injections & Periocular Surgery
This course provides an introduction to minor periocular surgical procedures including informed consent, OSHA guidelines and asepsis, sterile techniques, lesion removal, and post-operative wound care. Various techniques, including radiofrequency surgery will be discussed. Injection topics include indications and techniques for periocular injections, venipuncture, local anesthesia, and emergency procedures for anaphylaxis.

OPT 811, 812, 813, 821, 822, 823, 831, 832, & 833 Clinical Externships
The fourth-year rotations occur within the KYCO clinical network and include direct supervised patients care in the Primary Eye Care clinics with rotations to appropriate clinical facilities for direct and observed supervised clinical experience in specialty eye diseases, contact lenses, pediatrics, low vision, ophthalmic dispensing services as well as observational participation in other medical specialty clinics. Clinical management by interns during the fourth year is expected to reflect an ability to evaluate and manage a complex case load including surgical care.

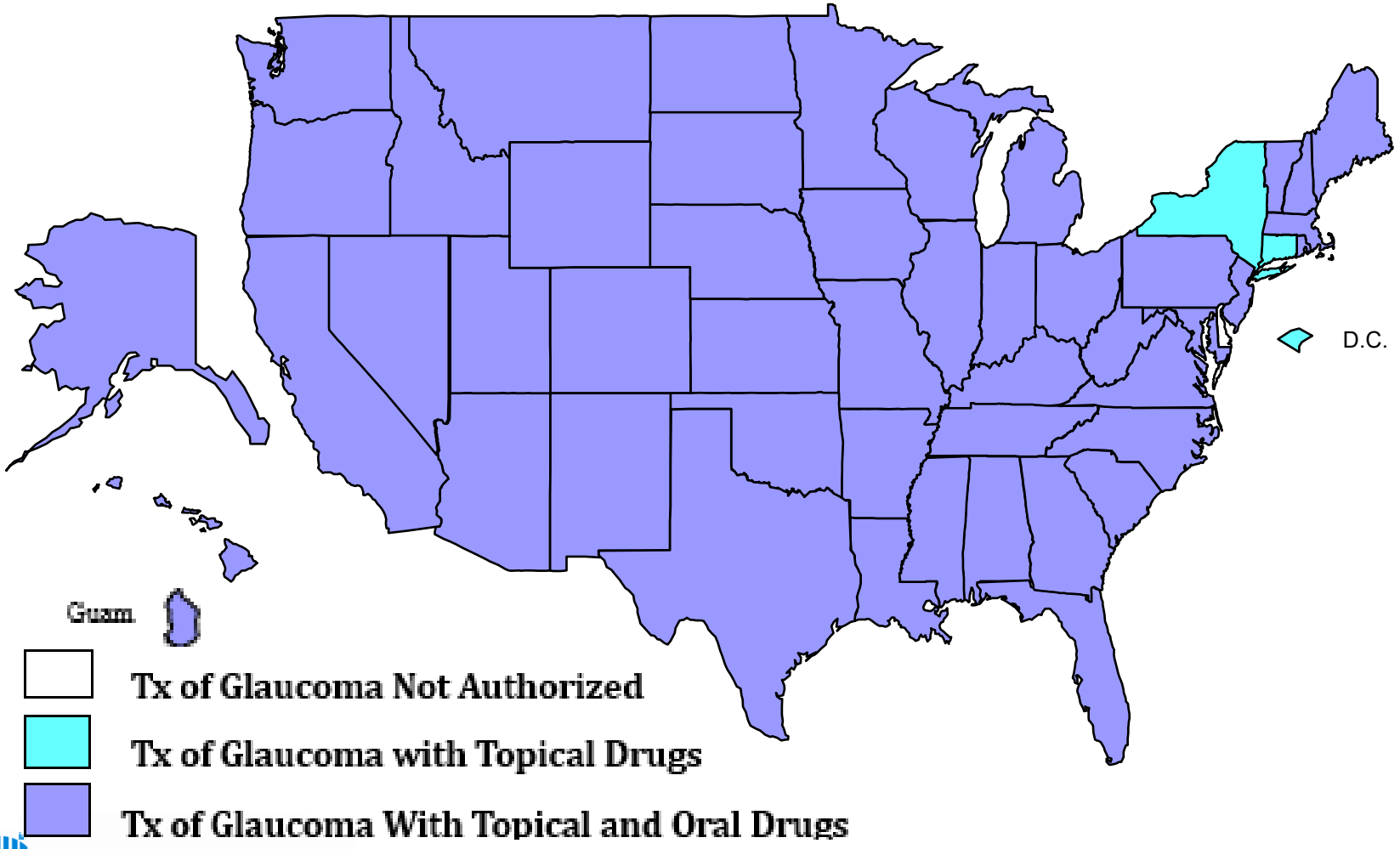
Oral Steroids



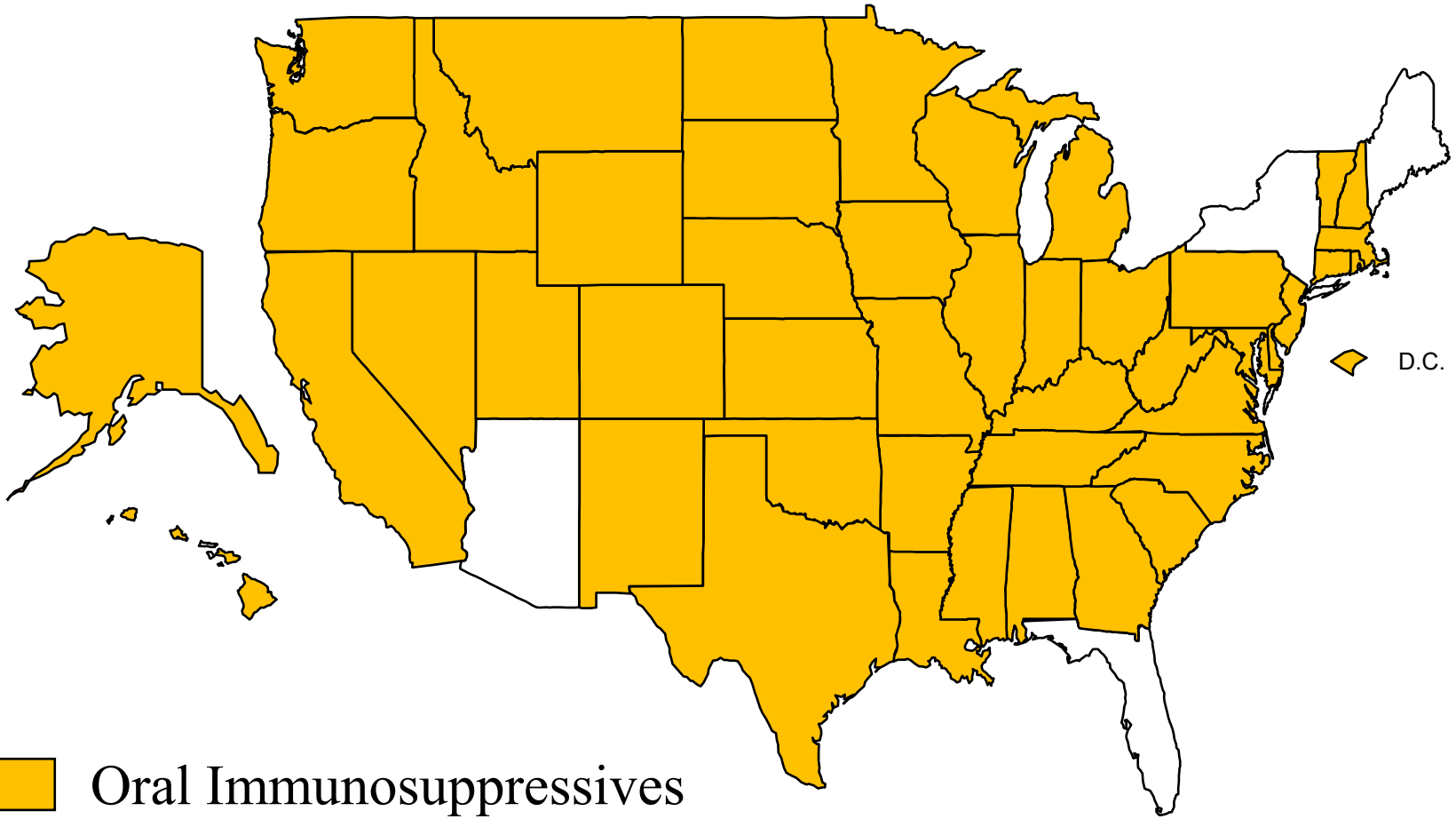
Oral Anti-fungal Medications



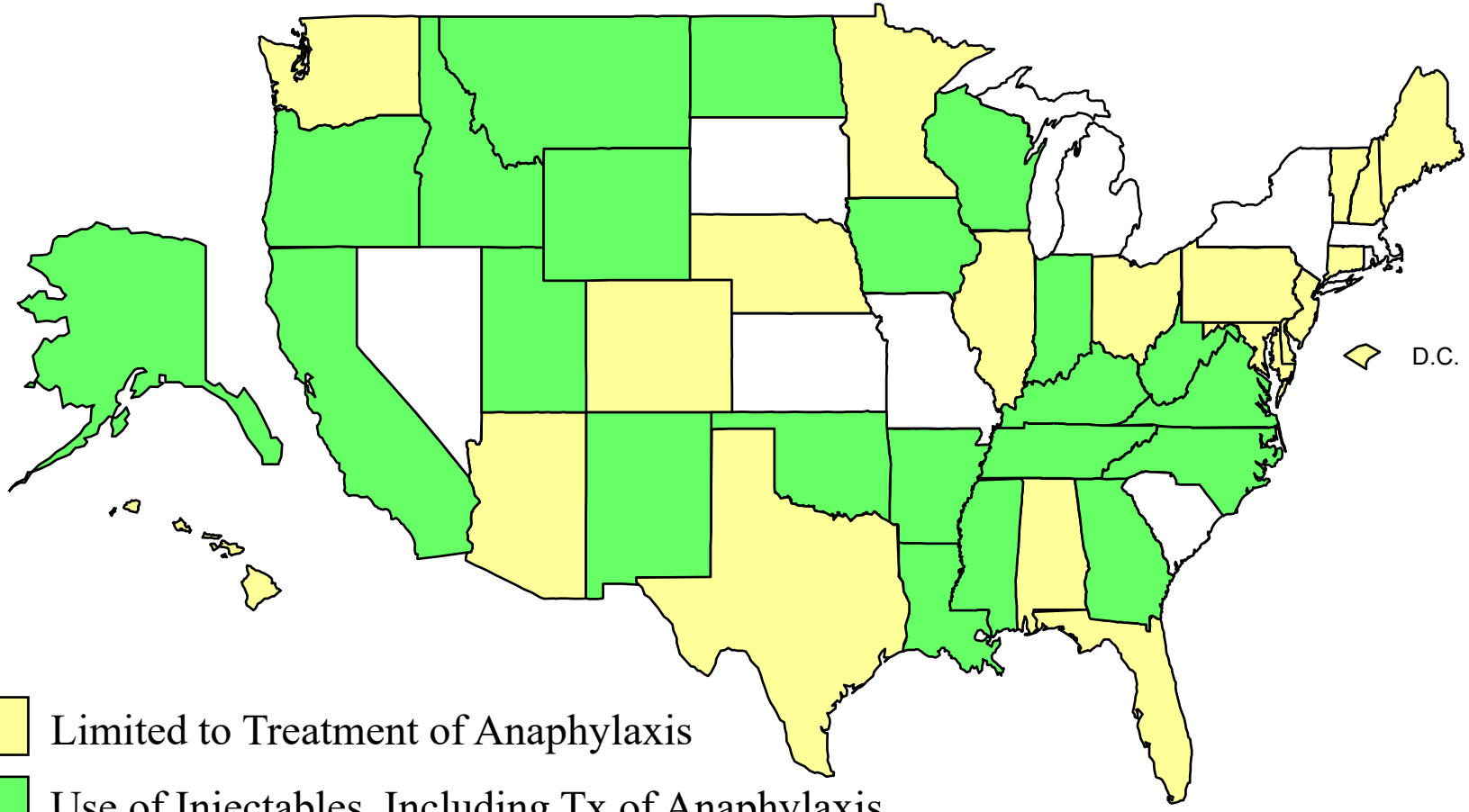
Glaucoma Prescriptive Authority



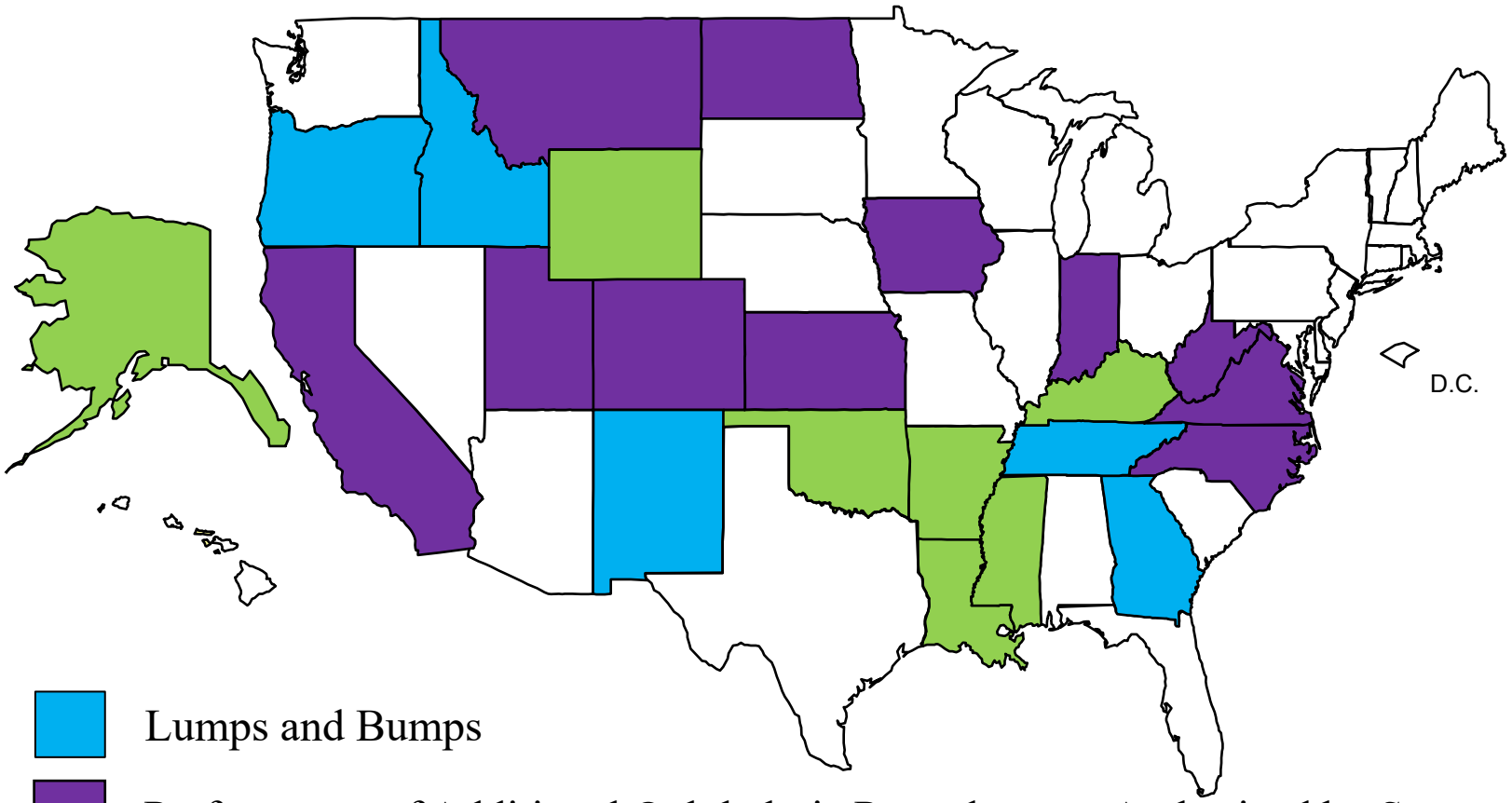
Oral Immunosuppressives



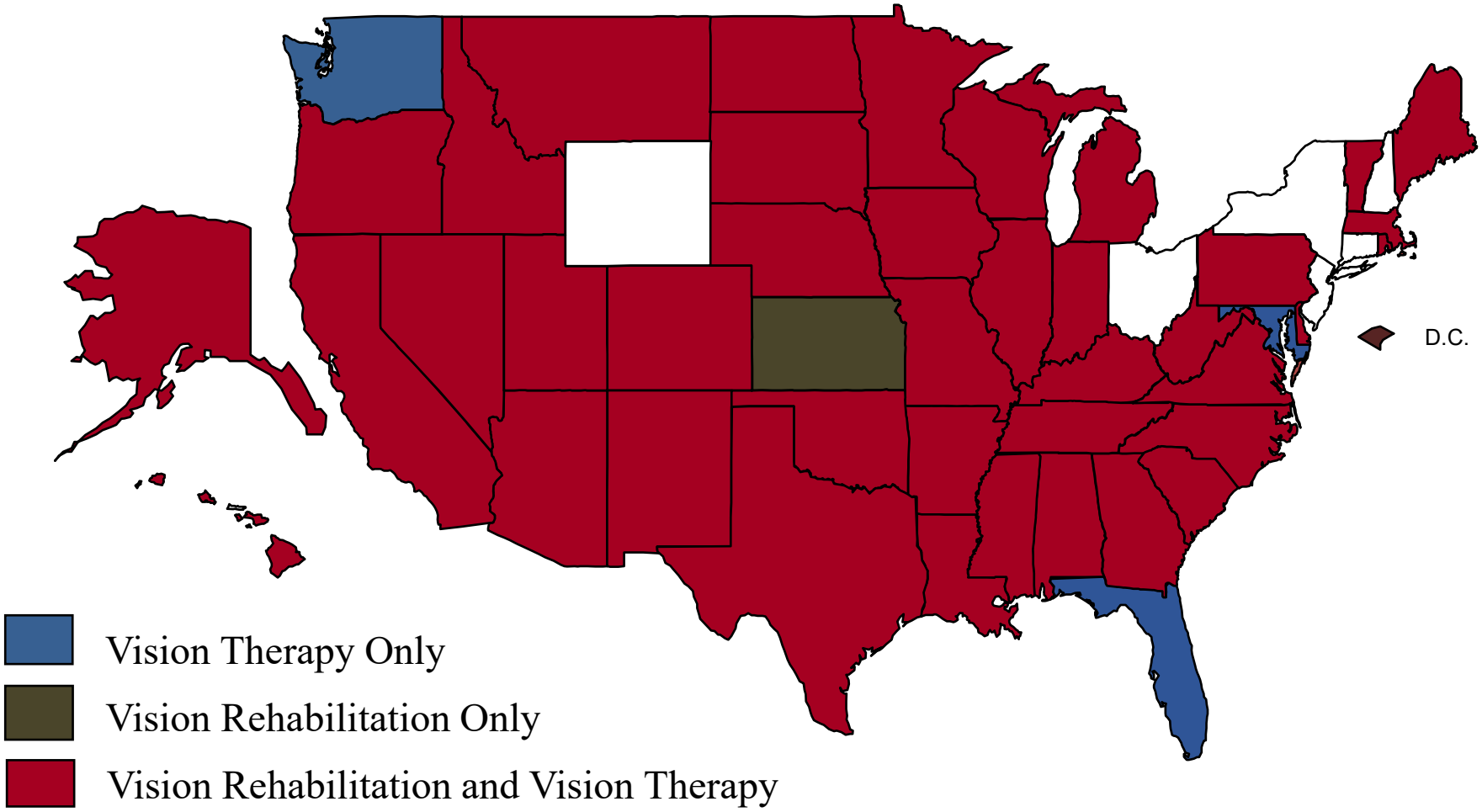
Injectable Authority



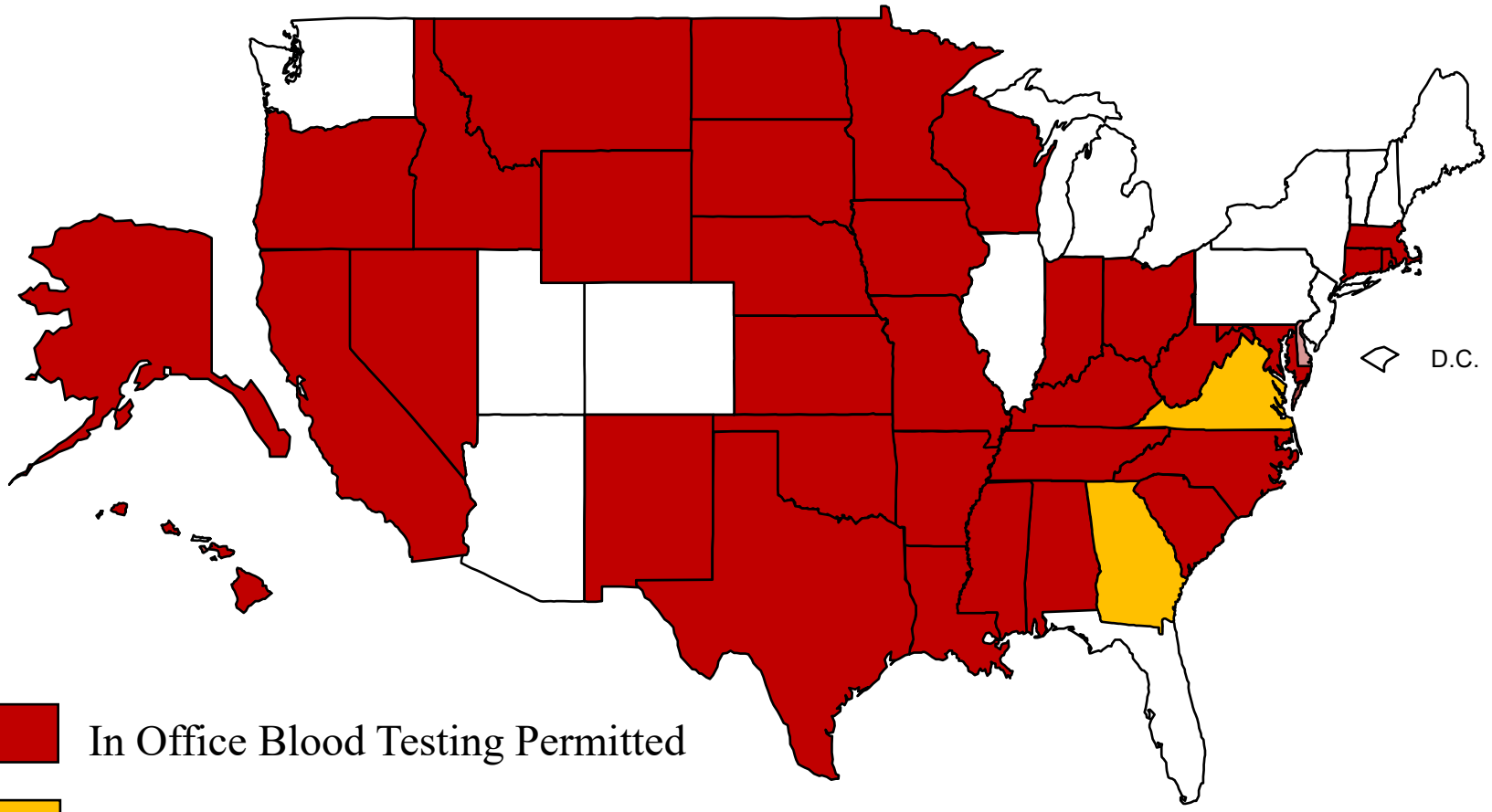
Ophthalmic Procedures Beyond Foreign Body Removal and Treatment of the Lacrimal System



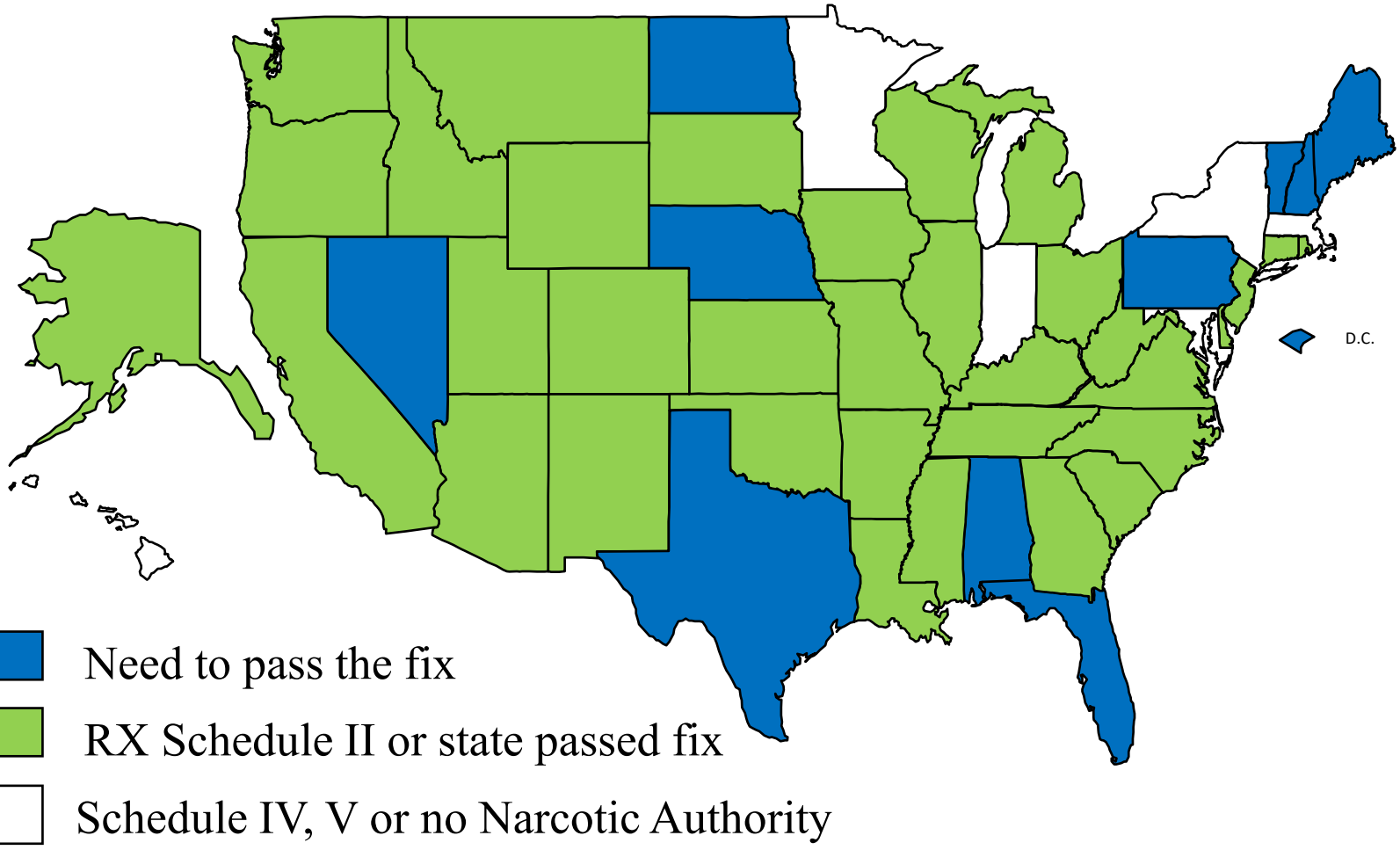
Vision Rehabilitation or Vision Therapy



In Office Blood Testing Permitted



RX of Hydrocodone Combination Drugs



State	Ophthalmic Surgery	Lumps and Bumps	State Authorized Procedures	Rx Controlled Substances	Rx Hydrocodone	Oral Steroids	Oral Immunosuppressives	Oral Anti-fungals	Glaucoma Authority	Injectable Authority	Diagnostic Testing	In-office Blood Testing	Vision Rehab/Therapy	Punctal Plug and Foreign Body Removal
Alabama				3-5		X	X	X	T&O	A	X	X		X
Alaska	X	X	P	2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
Arizona				2!,3	X	X			T&O	A	X		R&T	X
Arkansas	X	X	P	2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
California			P	2!,3	X	X	X	X	T&O	X	X	X	R&T	X
Colorado			P	2!, 3-5	X	X	X	X	T&O	A	X		R&T	X
Connecticut				2-5	X	X	X	X	T	A	X	X		X
D.C.							X		T	A	P		R	X
Delaware				2!, 3-5	X	X	X		T&O	A	P	P		X
Florida				3-4[i]					T&O	A	P			X
Georgia		X		2!,3-5	X	X	X	X	T&O	X	P	P	R&T	X
Hawaii						X	X	X	T&O	A	X	X	R&T	X
Idaho		X		2-5	X	X	X	X	T&O	X	X	X	R&T	X
Illinois				2!, 3-5	X	X	X	X	T&O	A	P		R&T	X
Indiana			P	4[ii]		X	X	X	T&O	X	X	X		X
Iowa			P	2-5	X	X	X	X	T&O	X	X	X	R&T	X
Kansas			P	2-5	X	X	X	X	T&O		X	X	R	X
Kentucky	X	X	X	2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
Louisiana	X	X	X	2-5	X	X	X	X	T&O	X	X	X	R&T	X
Maine				3-5				X	T&O	A	X		R&T	X
Maryland						X	X		T	A	X			X
Massachusetts				3-5		X	X	X	T&O		X	X	R&T	X
Michigan				2!, 3-5	X		X	X	T&O		P			X
Minnesota				4-5			X	X	T&O	A	X	X	R	X
Mississippi	X	X		2!,3-5	X	X	X	X	T&O	X	X	X	R&T	X
Missouri				2-5	X	X	X	X	T&O		X	X	R&T	X
Montana			P	2-5	X	X	X	X	T&O	X	X	X		X
Nebraska				2-5	X	X	X	X	T&O	A	X	X	R&T	X
Nevada				3-5		X	X	X	T&O		X		R&T	X
New Hampshire				3-4		X	X	X	T&O	A	X			X
New Jersey				2!, 3-5	X	X	X	X	T&O	A	P			X
New Mexico		X		2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
New York									T					X
North Carolina			P	2-5	X	X	X	X	T&O	X	X	X		X
North Dakota			P	3		X	X	X	T&O	X	X	X		X
Ohio				2-4	X	X	X	X	T&O	A	X			X
Oklahoma	X	X	X	2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
Oregon		X		2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X

State	Ophthalmic Surgery	Lumps and Bumps	State Authorized Procedures	Rx Controlled Substances	Rx Hydrocodone	Oral Steroids	Oral Immunosuppressives	Oral Anti-fungals	Glaucoma Authority	Injectable Authority	Diagnostic Testing	In-office Blood Testing	Vision Rehab/Therapy	Punctal Plug and Foreign Body Removal
Pennsylvania				2!,3-5	X	X	X	X	T&O	A			R&T	X
Rhode Island				2!, 3-5	X	X	X	X	T&O		X	X	R&T	X
South Carolina				2!, 3-5	X		X	X	T&O		X	X		X
South Dakota				2-5	X	X		X	T&O		X	X	R&T	X
Tennessee		X		2-5	X	X	X	X	T&O	X	X	X	R&T	X
Texas				3-5		X	X	X	T&O	A	X	X	R&T	X
Utah		X	P	2!, 3-5	X	X	X	X	T&O	X	X		R&T	X
Vermont				3-5		X	X	X	T&O	A	P		R&T	X
Virginia		X	P	2!,3-4	X	X	X	X	T&O	X	X	P		X
Washington				2!, 3-5	X		X	X	T&O	A	X		T	X
West Virginia			P	2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
Wisconsin				2!, 3-5	X	X	X	X	T&O	X	X	X	R&T	X
Wyoming	X	X	X	2!,3-5	X	X	X	X	T&O	X	X	X		X

A - anaphylaxis only

P – Performance of Additional Surgical Procedures as Authorized by State Board of Optometry

T&O - topicals and orals

2! - Hydrocodone products only

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[i] APAP w/codeine & Tramadol

[ii] Tramadol

POSITION PAPER

Optometry Graduates' Clinical Competencies

Approved, ASCO Board of Directors, 11/15/21

Optometric education is the foundation upon which clinical practice skills and competencies are learned, practiced and evaluated, with rigor, to meet the highest possible levels for eye health and vision care. ASCO's position is that:

- Life-long learning builds on this educational foundation.

- The advancement of optometric education constantly evolves to meet the demands of the patient population, in order to best serve its primary eye health and vision care needs.

- Optometry is a legislated profession, and each state's scope of practice is dictated by the laws within that state, which are enacted by that state's legislative body according to the available evidence which supports the contemporary practice of optometry. This evidence represents a valuable resource for well-informed scope of practice.

- The Schools and Colleges of Optometry are upheld by elected officials at the state and federal levels as the definitive leaders on curricula that teach all aspects of comprehensive optometric education.

All optometry schools and colleges within the United States are members of the Association of Schools and Colleges of Optometry (ASCO) that follow the standards of the Accreditation Council on Optometric Education (ACOE), thus ensuring their graduates have attained the clinical competencies necessary for the independent practice of contemporary optometry. Furthermore, all ASCO member institutions regularly ensure ongoing curricular review and evaluation with guidance from appropriate stakeholders. All accredited schools and colleges of optometry teach to the highest levels of optometric practice, so as to best prepare future Doctors of Optometry and future leaders of the profession.

Framework for Developing Optometric Curriculum Guidelines and Educational Standards for Ophthalmic Surgery

Statement of Purpose

Patients benefit from increased choice, access, and competition for services provided by qualified health care professionals. Fragmentation of standards in optometry, scope of practice, and expectations across the United States create uncertainty and confusion for the public, profession, regulators, students, and educators.

As the result of an iterative process that began with a project team appointed by the American Optometric Association, and with input from the Association of Schools and Colleges of Optometry (ASCO), a preliminary list of core competencies and objectives are provided as a framework for a clear, concise plan for stakeholders to encourage discussion and action for increasing patient access to ophthalmic surgery. These proposed competencies are a need-based addition to the entry-level student learning outcomes endorsed by ASCO, which are defined in the *2011 Attributes of Students Graduating from the Schools and Colleges of Optometry*.

Similar to the standards developed for dental laser education in 1999, this document describing competencies in ophthalmic surgery is "intended to provide guidance to Doctors of Optometry and educators, and to assure the public on the issues of education, competency, and quality of care."[1] The responsibility of demonstrating competency in ophthalmic surgery is profession-wide and achieved through entry-level education in the schools and colleges of optometry and may be supplemented with post-graduate education in residency. For existing Doctors of Optometry without entry-level preparation in ophthalmic surgery, post-graduate continuing education workshops utilizing blended learning technologies would be appropriate.[9]

Several states currently have optometric practice acts which include in their scope the ability to perform ophthalmic surgery such as but not limited to: injections of diagnostic and therapeutic pharmaceutical agents; drainage of eyelid chalazia, cysts, abscesses, bullae and seroma; excision and biopsy of cutaneous lesions; repair of eyelid lacerations, removal of foreign bodies of the cornea and conjunctiva; probing/irrigation of the lacrimal drainage structures; the use of ultraviolet, visible, and infrared radiation for treatment of specific ocular conditions; and the use of radiofrequency and thermal cautery.

The term "ophthalmic surgery" is recommended as a description of skills Doctors of Optometry should possess in order to meet the needs of the patient population adequately. These procedures may be routinely performed in the typical office of a Doctor of Optometry, as surgical procedures and the management of their possible complications, fall well within the established optometric curriculum, assessment tools, and documentation of the ASCO institutions.[10]

These curriculum guidelines support the major tenets of health care reform by broadening access to care, providing clarity of the standards for practicing at the highest level of licensure, potential cost savings by reducing duplicate testing inherent in a referral-only based system, and the opportunity to increase patient satisfaction.

Process

The framework draws substantially from the Accreditation Council for Graduate Medical Education (**ACGME**) core competencies, the previously mentioned ASCO 2011 "Attributes" Report, the ASCO Functional Standards for Optometric Education referenced during the admissions process at all schools and colleges of optometry, Accreditation Council on Optometric Education (**ACOE**) standards for the professional optometric degree, Northeastern State University Oklahoma College of Optometry (**NSUOCO**) Surgical Anatomy and Introduction to Office-based Surgery (OPT 7042) Course, and coursework of Southern College of Optometry, and the Illinois College of Optometry.

The framework does not specify an exact number of credit hours, contact hours, observations or performed procedures. Educational research over the past two decades has advanced our knowledge of learning and techniques best suited to facilitate learning. The strategies and methods recommended today are not limited to the strategies of the past. Thanks to the emergence of new technology-based educational tools, we can now offer today's learner a more valuable experience based on interaction and experimentation.[9] Studies have demonstrated that authentic learning activities support the acquisition of knowledge that cultivates the kinds of skills that are lasting and more portable.[13]

Per the 2011 *Attributes of Students Graduating from the Schools and Colleges of Optometry Report*:

> "Health care education programs and their accreditors must focus on the student's (provider's) demonstration of competency for which attitudes, knowledge and skills are pre-requisite."

The important and valuable task of managing and/or evaluating the achievement of educational outcomes certifying that graduates of Schools and Colleges of Optometry possess appropriate attributes to allow them to serve the needs of the public is an ongoing and significant task."[4]

The three pillars for the core competencies for entry-level ophthalmic surgery include: **1) Professional Values and Ethics; 2) Knowledge; and 3) Skill**. Each core competency is accompanied by a list of suggested objectives which provide examples of activities to measure knowledge, skill, and outcomes. **The framework is a starting point and is not meant as a prescriptive list of activities to restrict, limit, or regulate.** In fact, the project team looks forward to broad engagement and discussion with stakeholders to facilitate implementation. The "skills" competencies expand upon the entry-level student learning outcomes in the 2011 ASCO Attributes Report, which include: "...the ability to prescribe or use ophthalmic materials, contact lenses, vision therapy, low vision devices, pharmaceuticals, and certain surgical

procedures, to treat and otherwise manage common vision disorders and disease,[4] "and specific procedures utilizing injections, biopsy, excision, curettage, irrigation, ultraviolet radiation, radiofrequency and thermal cautery, to treat and manage vision disorders and disease.

Educational Structure

The process we used to develop the framework for core competencies and objectives was modeled after the work of the ASCO Low Vision Educator Special Interest Group (SIG). An iterative process using the Delphi Survey Technique and Nominal Group Technique led to consensus and has been used in other health outcomes research.

While the project team sponsor has been the American Optometric Association (AOA), with further input from ASCO, the intent is to have broad stakeholder engagement from other professional associations (e.g., AOA, AAO, ASCO); state associations; regulatory boards (e.g., ARBO and individual states); assessment/testing organizations, (NBEO, ABO, ACOE); and interested optometrists.

This initial draft report is submitted in fulfillment of the charge from the 2017 AOA House of Delegates to investigate a process to bring together stakeholders across the profession, accreditation, and regulatory agencies to develop a way forward for increasing patient access to ophthalmic surgery.

Project Team Members

The project team consists of five optometrists with varied volunteer and practice experience spanning multiple optometric organizations. The team includes Christopher Wolfe, OD, FAAO,; Richard Castillo, OD, DO,; Gregory Moore, OD,; Stanley Woo, OD, MS, MBA, FAAO,; Chris Wroten, OD,; and AOA staff member Catherine Hendricks.

The Government Affairs Committee of the Association of Schools and Colleges of Optometry (ASCO) has facilitated feedback from the schools and colleges of optometry through review by the ASCO Academic Affairs Committee, ASCO Clinical Affairs Committee, ASCO Chief Academic Officers, and the ASCO Board of Directors.

A. Professional Values and Ethics[3,4]

A.1. Expected to provide patient care that is compassionate, appropriate, and effective for the promotion of health and the treatment of health problems.

A.1.1 Be respectful and responsive to individual patients' preferences and needs, and ensure their values guide all clinical decisions[1]

A.1.2 Be mindful and apply varying dimensions of compassion including attentiveness, active listening, helping, and understanding[2]

A.2. Expected to demonstrate the ability to investigate and critically evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on perpetual self-evaluation and life-long learning.[3,4]

A.2.1 Identify strengths, deficiencies, and limits in one's knowledge and expertise

A.2.2 Systematically analyze practice using quality improvement methods and implement changes with the goal of practice improvement

A.2.3 Incorporate formative evaluation feedback into daily practice
A.2.4 Employ evidence-based practice and participate in learning and research activities to the extent possible[7]
A.2.5 Working knowledge of applicable Clinical Practice Guidelines (AOA) and Preferred Practice Patterns (AAOphthalmology)
A.2.6 Set learning and improvement goals

A.3. Demonstrate a commitment to fulfilling professional responsibilities and an adherence to ethical principles.
A.3.1 Responsiveness to patients needs that supersede self-interest
A.3.2 Compassion, integrity, and respect for others
A.3.3 Demonstrate commitment to continuity of surgical care
A.3.4 Accountability to patients, society and the optometric profession
A.3.5 Refer to and make visible the Optometric Oath as a resource guiding clinical practice philosophy
A.3.6 Adherence to patient privacy and protection policies

A.4. Participate in identifying system errors and implementing potential systems solutions, including participation in disease and clinical registries and government reporting programs as appropriate.
A.4.1 Apply quality improvement to identify hazards in patient care with the objective to improve outcomes[7]
A.4.2 Participate in a qualified clinical data registry, like AOA MORE
A.4.3 Participate in prescription monitoring programs (PMP)
A.4.4 Awareness of reporting options and requirements to state, regional, or national authorities
A.4.5 Maintenance of procedure logs in various practice settings
A.4.6 Report adverse outcomes in ophthalmic surgery as part of quality assurance

B. <u>Knowledge</u>[3,4]
B.1. Expected to demonstrate knowledge and application of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences to patient care.
B.1.1 Must demonstrate competence in their knowledge of basic and clinical sciences specific to optometry and ophthalmic surgery
B.1.2 Evidence-based medicine
B.1.3 Outcomes-based registries

B.2. Able to implement appropriate infection control, cleaning, and sterilization protocols, as well as biohazardous waste disposal procedures.
B.2.1 Aseptic technique
B.2.2 Awareness, implementation, and documentation of applicable OSHA requirements
B.2.3 Personal protective equipment/barriers for patient and provider

B.3. Expected to demonstrate an understanding of Applied Basic Sciences.
B.3.1 Integration and clinical application of anatomy, physiology, hemostasis, histopathology,

and pathophysiology. Describe actions, mechanisms, and applications of relevant pharmacological and anesthetic effects on organ systems and adverse reactions

B.3.2 Familiarity with the principles of energy-tissue interactions including laser, visible ultraviolet and infrared light, electrocautery and radiofrequency sources

B.4. Demonstrate knowledge of intra and postoperative complications and how to manage them.
B.4.1 Hemorrhaging
B.4.2 Infection
B.4.3 Intraocular hypertension
B.4.4 Inflammation
B.4.5 Anesthesia and anesthesia-related adverse events
B.4.6 Adverse pharmaceutical reactions including anaphylaxis
B.4.7 Wound healing complications
B.4.8 Other potential complications, relevant to the procedure

B.5. Expected to understand ophthalmic surgical instrumentation, including its purpose, design, intended use, and related equipment and supplies.
B.5.1 Equipment for injection
B.5.2 Wound closure
B.5.3 Surgical instrumentation
B.5.4 Ophthalmic lasers
B.5.5 Radiosurgical technology
B.5.6 Personal protective equipment for providers and patients
B.5.7 Sterilization of surgical equipment
B.5.8 Asepsis and sterile field creation
B.5.9 Ancillary equipment and supplies

B.6. Working knowledge of the laws and regulations relating to ophthalmic surgery.
B.6.1 Occupational Safety and Health Administration (OSHA)
B.6.2 State scopes of practice
B.6.3 Centers for Medicare and Medicaid Services (CMS)
B.6.4 Appropriate coding and billing practices
B.6.5 Accreditation and credentialing – e.g., Accreditation Council on Optometric Education (ACOE), American Board of Optometry (ABO), Joint Commission (surgery centers, and hospitals)
B.6.6 Stark and anti-kickback statutes

B.7. Demonstrates an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.[14]
B.7.1 Work effectively in various health care delivery settings and systems relevant to their clinical discipline
B.7.2 Coordinate patient care within the health care system relevant to their clinical discipline
B.7.3 Advocate for quality patient care and optimal patient care outcomes
B.7.4 Incorporate considerations of cost awareness and risk-benefit analysis inpatient and/or

population-based care as appropriate

B.7.5 Work in inter-professional teams to enhance patient safety, care and improve quality

B.7.6 Participate in identifying system errors and implementing potential systems solutions

C. Skills[3,4,8]

C.1. Ability to obtain an appropriate case history and proper informed consent

C.2. Be able to properly document an optometric surgical procedure report following the standards set by the JCAHO and AAAHC for sufficient information to:

C.2.1 Identify the patient

C.2.2 Support the diagnosis

C.2.3 Justify the treatment

C.2.4 Document the postoperative course and results

C.2.5 Promote continuity of care

C.3. Appropriately evaluate and assess the ophthalmic and general medical indications and contraindications for ophthalmic surgery in order to obtain a valid informed consent, including alternatives, risks, benefits, and limitations or contraindications.

C.4. Provide acute and long-term post-procedure care for ophthalmic surgery.

C.4.1 Management and/or treatment of adverse events

C.4.2 Maximizing procedural outcomes and systematic assessment for quality improvement

C.4.3 Sequelae of procedure complications

C.4.4 Wound healing

C.4.5 Medications

C.4.6 Necessity for further or ongoing intervention or consultation

C.5. Manage acute and chronic complications which may be associated with ophthalmic surgery and anesthesia.

C.5.1 Supportive training (e.g., CPR, Basic Life Support)

C.5.2 Ability to manage early and late stage wound complications

C.5.3 Ability to identify and respond to intra and postoperative systemic complications.

C.5.4 Ability to utilize resuscitative equipment

C.6. Expected to demonstrate the psychomotor skills and ASCO Functional Standards necessary to safely and effectively perform procedures.

C.6.1 Coordination and control of activity in free space and/or through magnification and illumination (e.g., manual dexterity, eye-hand coordination, and kinesthetic sense)

C.7. Expected to demonstrate appropriate use, indication, and action of ophthalmic ultraviolet, visible, and infrared radiation LASER procedures

C.7.1 Trabeculoplasty

C.7.2 Post-cataract capsulotomy

C.7.3 Peripheral iridotomy

C.7.4 C.6.4 Refractive corneal modification for purposes of refractive changes

C.8. Expected to demonstrate appropriate use, indication, and action of ophthalmic radiofrequency and thermal cautery procedures
C.8.1 Procedural hemostasis
C.8.2 Lesion removal

C.9. Expected to demonstrate the psychomotor and cognitive skills necessary to perform nasolacrimal procedures
C.9.1 Punctal dilation and irrigation
C.9.2 Lacrimal probing
C.9.3 Punctal occlusion
C.9.4 Punctoplasty

C.10. Expected to demonstrate the psychomotor and cognitive skills necessary to perform corneal procedures
C.10.1 Foreign body (FB) removal
C.10.2 Epithelial debridement
C.10.3 Emergent paracentesis
C.10.4 Cornea/Photorefractive Keratectomy
C.10.5 Cornea/Collagen cross-linking
C.10.6 Microstromal puncture

C.11. Expected to demonstrate the psychomotor and cognitive skills necessary to perform conjunctival procedures
C.11.1 FB removal
C.11.2 Lymphatic cyst removal
C.11.3 Granuloma removal
C.11.4 Biopsy

C.12. Expected to demonstrate the psychomotor and cognitive skills necessary to administer local and topical anesthesia effectively
C.12.1 Local anesthesia toxicity and management
C.12.2 Allergic reaction and anaphylaxis
C.12.3 Infiltrative local anesthesia
C.12.4 Regional anesthesia

C.13. Expected to demonstrate the psychomotor and cognitive skills necessary to perform injection techniques effectively
C.13.1 Intradermal
C.13.2 Subcutaneous
C.13.3 Subconjunctival
C.13.4 Intralesional
C.13.5 Intramuscular
C.13.6 Venipuncture
C.13.7 Intraocular

C.14. Expected to demonstrate the psychomotor and cognitive skills necessary to perform procedures on the lids and adnexa effectively
C.14.1 Suture techniques, including suture removal
C.14.2 Lesion excision, scalpel, scissors, dermablade, currette
C.14.3 Lesion incision and curettage
C.14.4 Cutaneous lesion biopsy
C.14.5 Intralesional injection
C.14.6 Lesion radiosurgical destruction
C.14.7 Laceration repair
C.14.8 Everting lid sutures for involutional entropion

C.15. Expected to demonstrate effective, culturally competent, interpersonal communication skills, oral and written, that result in a clear understanding of health information by patients, their families, and health professionals which result in meaningful outcomes for the patient
C.15.1 Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
C.15.2 Communicate effectively with physicians, other health professionals, and health related agencies
C.15.3 Maintain comprehensive, timely, and legible electronic, or paper, health records, where applicable
C.15.4 Act in a consultative role to other physicians and health professionals
C.15.5 Work effectively as a member or leader of a health care team or other professional groups

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Doctor of Optometry Professional Education: A Review of Training in Ophthalmic Surgery

As with the exponential growth of medical knowledge in today's evolving health care arena, the profession of Optometry continues to incorporate the latest clinical technologies and advances in patient care. Optometric education in 21st century eye health and vision care continues to combine cutting-edge, expanded didactic and clinical curricula. For the U.S. to achieve optimum population health outcomes, this knowledge and expertise must be made adaptable to augmented community wide access. Doctors of optometry require modernization of state practice acts that incorporate today's educational and clinical advances into contemporary scope of practice.

Scope of practice of health care professions are defined by state legislatures. To address questions regarding what today's Doctor of Optometry graduates are learning and how they are trained in preparation to deliver comprehensive eye care, this document provides an overview of today's professional Doctor of Optometry programs.

Definition of Optometry

Doctors of optometry take a leading role in patient care with respect to eye health and vision care. Doctors of optometry examine, diagnose, treat, and manage diseases, injuries, and disorders of the visual system, the eye, and associated structures as well as identify, diagnose and coordinate care of related systemic conditions affecting the eye. As primary health care providers, Doctors of optometry have extensive, ongoing training to examine, diagnose, treat and manage ocular disorders, diseases and injuries, and ocular complications and manifestations of systemic diseases. Doctors of optometry are the nation's front-

line primary eye care providers; doctors of optometry provide more than two-thirds of primary eye health and vision care in the U.S. Trend analysis of Medicare Physician/Supplier data show an increase of more than 740,000 patients for optometry and a decrease of more than 450,000 patients for ophthalmology, as measured over the last six years. This represents a 12.3% increase in total persons with optometry utilization and a 4.2% decrease in total persons with ophthalmology utilization, consistent with a growth of primary care.[i]

About Doctor of Optometry Training and Education

Professional post-baccalaureate education of students pursuing a Doctor of Optometry (O.D.) degree consists of classroom, laboratory, and clinical education, including a progressive clinical experience over four years, similar to students pursuing an allopathic (M.D.) or osteopathic (D.O.) medical degree or Dental Medical Degree (DMD). In the final two years when M.D./D.O. students are doing rotations to determine their specialty selection D.M.D./O.D. students begin a immersive training period of doctorate-level health care professional clinical study focused on their pre-chosen specialty. Optometry students focus on the eye, visual system, and associated systemic disease through classroom learning, laboratory exercises, and direct clinical care and dental students do likewise for oral systems At the end of the four years optometry and dental students have the option of choosing a residency, whereas medical and osteopathic students must select and fulfill a residency requirement to practice their speciality.

In addition to concentrations on the eye, visual system, and systemic health, optometry students, progress through basic medical sciences in didactic and hands-on learning that includes:

- Histology, genetics, and biochemistry
- Human anatomy and physiology including whole body, head/neck, and eye
- Cell and molecular, biology, biochemistry, immunology, and pathology
- Microbiology, pharmacology, therapeutics, and pathology
- Neuroscience, with a concentration on the visual system
- Cardiovascular, respiratory, musculoskeletal, renal, gastrointestinal, and endocrine system anatomy, physiology and cell biology
- Clinical medicine of systemic diseases and disorders
- Principles of evidence based medicine.

Doctoral education also includes didactic and clinical education unique and specific to doctors of optometry in supporting their clinical care role and

comprehensive approach to assessment. The curriculum includes demonstrated competency in the knowledge of:

- Geometric, physical, and ophthalmic optics
- Ocular anatomy, physiology, and biochemistry
- Pharmacology
- Ocular diseases and disorders; anterior, posterior, and other structural diseases and their evaluation, management, and treatment
- Neuroanatomy and neuro-ophthalmic disease
- Ocular manifestations of systemic diseases and disorders and their treatment
- Visual neurophysiology and perception
- Binocular/developmental vision, and pediatrics
- Geriatrics; chronic visual impairment; vision loss
- Contact lenses; including therapeutic, refractive, and diagnostic applications
- Ophthalmic Surgery and ocular disease co-management
- Injections, lasers, and advanced ocular techniques.

Doctor of Optometry Training in the U.S. Department of Veterans Affairs

The U.S. Department of Veterans Affairs (VA) is home to the largest optometric clinical education externship program in the U.S, as an adjunct to the education that takes place in clinics at optometry schools/colleges. Every year there are about 1,400 opportunities for Doctor of Optometry candidates to rotate at VA medical facilities for clinical education and training. Each year over 80 percent of the approximately 1,700 graduates of accredited schools and colleges of optometry have performed public health care services at VA. All residents receive training in primary eye care and with VA's primarily geriatric patient population, the management of ocular disease is a significant portion of the training experience. In April 2020, the Veterans Health Administration (VA) issued Directive 1899 affirming that doctors of optometry and others should practice to the full scope of their licensure and training. In August 2020, VA rescinded Directive 1132, removing a previous ban that had prevented doctors of optometry from providing therapeutic laser eye procedures to veterans. As a result, optometric clinical education is expanding over time to ensure full scope training opportunities and better support the VA Optometry Service as it works to: provide care for about 80% of veterans receiving eye care services annually, perform about 70 percent of the more than 3.4 million select ophthalmic procedures, and provide nearly 99 percent of vision rehabilitation services in low vision clinics and blind rehabilitation centers each year.

Doctor of Optometry Program Admission Requirements

Admission requirements for optometric education remain consistent with U.S. pre-medical school requirements. Pre-optometry students are included in undergraduate pre-medical and health professional advising and counseling programs to ensure successful completion of college requirements and planning for successful candidate matriculation into optometry schools and colleges while achieving their undergraduate bachelor's degree.

To successfully gain admission, required pre-optometry undergraduate didactic and laboratory coursework is extensive and covers a wide variety of advanced health, science, and mathematics courses, including general biology, general chemistry, organic chemistry, and physics. Additionally, optometry programs often require a host of associated coursework some of which is beyond that required for M.D./D.O. applicants:

- Human Anatomy and Physiology
- Biochemistry
- Microbiology
- Genetics
- Calculus
- Psychology
- Biostatistics/statistics
- English
- Social science and other humanities.

Optometry Admission Test (OAT) and Other Standardized Exams

All schools and colleges of optometry accept the OAT. Many schools and colleges also accept the GRE, MCAT, DAT, or PCAT in lieu of the OAT. The OAT is a standardized examination designed to measure general academic ability and comprehension of scientific information. It consists of four subtests: Survey of the Natural Sciences (Biology, General Chemistry, and Organic Chemistry), Reading Comprehension, Physics, and Quantitative Reasoning. The OAT is scored on a 200- to 400-point scale in increments of 10. At least one year of college education is required prior to taking the OAT, but most students elect to complete two or more years of college-level coursework prior to taking the exam.

Optometry Schools and Colleges

Optometry schools and colleges function either as private institutions, or as institutions within public universities as a component of a greater health care

medical and health sciences educational complex that includes medical, nursing, dental, and other health care professional programs. Ultimately, each accredited doctorate-level professional program must teach all necessary content for their graduates to pass professional national boards and meet state licensure requirements.

Accreditation

All optometry programs must meet extensive accreditation standards. As with other U.S. health care doctoral training programs, no person may be licensed to practice optometry in the United States unless they have graduated from an accredited school/college of optometry.

The Accreditation Council on Optometric Education (ACOE) is the only accrediting body for professional optometric degree (O.D.) programs, optometric residency programs and optometric technician programs in the United States and Canada.

ACOE is recognized as an accrediting body by two external agencies - the U.S. Department of Education (USDE) and the Council on Higher Education Accreditation (CHEA). Through periodic reviews by both USDE and CHEA, the ACOE demonstrates compliance with their respective criteria.

ACOE serves the public and the profession of optometry by establishing, maintaining, and applying standards to ensure the academic quality and continuous improvement of optometric education that reflect the contemporary practice of optometry. The scope of the ACOE encompasses professional optometric degree programs, optometric residency programs, and optometric technician programs. *In addition, schools/colleges are accredited by one of six regional organizations recognized by the United States Department of Education and the Council for Higher Education Accreditation.*

There are currently 23 U.S. optometry programs and two in Canada accredited by ACOE.

National Boards

All 50 states require successful completion of parts of the National Board of Examiners in Optometry prior to applying for state licensure to practice as a doctor of optometry in the U.S.

The National Board of Examiners in Optometry (N.B.E.O.) is the independent, not for profit testing organization that oversees and administers board testing for doctors of optometry in the continental U.S. and Puerto Rico. Established in 1951, the mission of the NBEO is "to serve the public and the profession of optometry by developing, administering, scoring, and reporting results of valid examinations that assess competence." Part I (Applied Basic Science) is taken the spring of the third year, Part II (Patient Assessment and Management) is taken in December of the fourth year, and Part III (Clinical Skills) is taken any time during your fourth year.

Special National Examinations

Additional voluntary examinations, including a national board certification exam and a laser and surgical procedures examination, have also been developed and are administered based on practice standards or evolving individual state licensure and advancing scope of practice requirements, and include:

- American Board of Optometry Board Certification
- Treatment and Management of Ocular Disease (TMOD®)
- Advanced Competency in Medical Optometry (ACMO®)
- Laser and Surgical Procedures Examination (LSPE™).

Doctor of Optometry Degree

Upon successful completion of optometry program requirements, candidates graduate from their accredited schools/colleges of optometry having earned and granted the degree, Doctor of Optometry (O.D.). Doctors of optometry are then eligible to apply for and take state licensure examinations. Individual U.S. state boards of optometry, as independent public agencies, determine requirements for licensure to meet state scope of practice guidelines.

Doctors of optometry can choose to participate in additional one-year post-graduate residency training programs following graduation from optometry school/college. This experience offers doctors of optometry focused training in a clinical area of optometric care such as pediatric optometry, primary care, cornea and contact lens, vision rehabilitation, and ocular disease.

The Doctor of Optometry Curriculum in Detail

While the sequence of course work varies from one program to another, some general characteristics are shared by all. In the first and second year of the

professional program, course work is concentrated in the basic and biomedical sciences (anatomy, physiology, pathology, biochemistry, pharmacology, and public health, optics, and vision science). These serve as the foundational underpinnings for clinical knowledge and application in the patient care setting. For example, the courses for anatomy and physiology are provided because they provide the required foundations necessary for surgical procedures. Furthermore, the course for physical optics is provided because this course provides the foundational knowledge to understand the properties of lasers. Patient care experience is incorporated with an increasing level of responsibility and increasing student learning expectations, culminating in a 12-month final year comprised entirely of direct patient care in a variety of clinical settings.

Typically, direct patient care experiences begin early in the curriculum. Students begin their clinical experience in pre-clinical skills laboratories with virtual reality simulators and classmates serving as patients in the first year, and then proceed to clinical training with real patients. This training includes obtaining full medical case histories, performing examinations, learning diagnostic and surgical techniques, and discussing treatment options and plans. As the curriculum progresses, students spend part of their time in the classroom and part of their time in the clinic examining, diagnosing and treating patients with acute and chronic eye diseases. The final year is entirely clinical training where clinicians are supervised one-on-one with an attending optometric physician, which includes off-campus clinical externship rotations. Sites for external rotations are available in the United States and abroad. Clinic settings include military facilities, Veteran's Affairs (VA) hospitals, public health service hospitals, community health centers, and various specialty and private practices. The lengths of the external rotations vary from eight to 16 weeks.

While it is not possible to include all curriculum outlines and course descriptions for every school/college of optometry, some sample course descriptions are included. These particularly focus on courses relating to advanced procedures or ophthalmic surgery. Full information on every institution's curriculum and course descriptions are available to the public on the individual schools/colleges' websites. Additional information is available via ASCO website at optometriceducation.org.

Example A: Western University of Health Sciences College of Optometry.

A composite listing of topics from various courses throughout the curriculum relevant to expanded scope of practice.

In the following section, a composite list of relevant topics is summarized. Because relevant content may be introduced in one course in the curriculum, may be reinforced in another course in the curriculum, may reach a higher level in another course in the curriculum, and may be applied in a subsequent course in the curriculum, it may not be readily evident that all of the important content is embedded within our curriculum simply upon review of the course descriptions provided. Here is the composite list of topics that span our curriculum:

- laser physics, hazards, and safety
- biophysics of lasers
- laser application on clinical optometry
- laser tissue interactions;
- laser indications, contraindications, and potential complications
- gonioscopy
- laser therapy for open angle glaucoma
- laser therapy for angle closure glaucoma
- posterior capsulotomy
- common complications: lids, lashes, lacrimal system
- medicolegal aspects of anterior segment procedures
- peripheral iridotomy
- laser trabeculoplasty
- minor surgical procedures
- overview of surgical instruments, asepsis
- surgical anatomy of the eyelids
- emergency surgical procedures
- chalazion management
- local anesthesia: techniques and complications.

OPTM 8120 Principles and Practices of Optometry VI: Laser Eye Procedures and Minor Surgical Eye Care (2.0 credit hours)

This course covers the uses of lasers to perform certain surgical eye procedures, including laser therapies for open angle glaucoma, for angle closure glaucoma, and for posterior capsulotomy. The course will include a review of laser biophysics, laser-tissue interactions, as well as contraindications and complications associated with laser procedures on ocular tissues. This course will also cover surgical preparation and management of lid and adnexal lesions with an emphasis on benign neoplasms and chalazion. Additional topics include medicolegal aspects of surgical eye care and postoperative wound care. The lab portion of the course will provide hands on experience in suturing techniques and ophthalmic laser operations.

OPTM 8021 Principles and Practice of Optometry V: Special Procedures (2.0 credit hours)

This course will cover the theory and methods of clinical techniques that build upon basic examination skills acquired during the courses Principles and Practice of Optometry I through IV. Clinical techniques including scleral depression, A- and B-scan ultrasonography, punctual occlusion, punctal dilation and irrigation, removal of foreign bodies from the cornea and conjunctiva, and the injection techniques of IM, SubQ and IV will be presented in a hands-on format. The course will include non-glaucoma visual fields and applications of significant optometric thought processing.

OPTM 6175 Ocular Disease: Diagnosis and Treatment of the Posterior Segment (4.0 credit hours)

This course builds upon the framework presented in the Principles and Practice of Optometry curricular track to present advanced concepts in ocular disease management. The anatomical, physiological, histological, and pathological processes of ocular disease will be emphasized. Topics include in-depth discussion of diseases and abnormalities of the vitreous and retina as well as vitreo-retinal pathology associated with systemic diseases.

OPTM 6073 Ocular Disease: Diagnosis and Treatment of Glaucoma (2.5 credit hours)

This course covers the pathophysiology, diagnosis, treatment, and management of patients with all forms of glaucoma, with an emphasis on evidence-based therapeutic interventions. The course includes technique and interpretation of visual fields for glaucoma diagnosis and management. Topical and systemic medical therapies will be emphasized. The course will also discuss current surgical management of various forms of glaucoma.

OPTM 6053 Optical Science: Physical Optics (3.0 credit hours)

This course presents the physics of light, including the wave and particle behavior of light. In particular, the course will include the characteristics of electromagnetic radiation, wave motion, total and partial coherence of light, interference, diffraction (single slit, double slit, gratings, circular apertures), zone plates, polarization, birefringence, anti-reflective lens coatings, lasers, emission and absorption spectra. Examples of applications in vision science and ocular diagnostic instruments will be provided.

OPTM 5133 Systemic Pharmacology (2.0 credit hours)

This course will cover medications commonly prescribed for systemic conditions, their indications and mode of action, as well as their ocular and visual side effects and toxicities. Topics include pharmacodynamics, pharmacokinetic aspects of drug formulations, routes of administration, and dosing & elimination, with an emphasis on drug indications, mechanisms of action, adverse effects, drug interactions, and contraindications. Additionally, a review of the pathophysiology of systemic diseases as it relates to current drug treatment paradigms will reinforce the connection between the medications and their corresponding indications.

OPTM 5130 Ocular Physiology (3.0 credit hours)

This course presents in depth coverage of the physiology of the eye, adnexa and visual systems. Topics include the physiology of the eyelids, lacrimal gland and its apparatus, tear production, cornea and lens, ocular fluid dynamics, vitreous body, retina, choroid and optic nerve. Topics of visual function and nutrition related to development and normal ocular function will be covered. When possible, relevant comparisons to disease states will be discussed to show the clinical relevance of the physiological concepts. The topics related to visual function includes, visual acuity, color vision, contrast sensitivity function, in health and disease states, accommodation function and decline in accommodation function with aging and presbyopic changes.

OPTM 5041 Anatomy for the Optometrist (4.0 credit hours)

This course covers all aspects of anatomy relevant to the practice of Optometry. Course content covers broad aspects of gross anatomy. Ocular anatomy is covered in detail including adnexa, orbit, orbital content, structure, and functional relationship of various ocular structures and their clinical importance. Through lectures and laboratory exercises students are introduced to the anatomy of the head and neck and neuroanatomy. Particular attention is paid to the cranial nerves, both their normal function and the numerous clinical syndromes that affect them as they pertain to optometric practice.

Sample topical outlines for selected content areas relevant to expanded scope of practice ***[selected courses only]*** In the following section, some samples of topical outlines are provided. These outlines go beyond the course descriptions to provide another layer of detail to more fully elaborate on the curricular content. The samples do not represent the entirety of the course content, and merely provide a portion of the content that is particularly relevant to demonstrating the education and training in support of expanded scope of practice.

OPTM 8120 Sample Topics

- Cataract surgery in Review
- IOL calculations and IOL types (premium IOLs)
- Femtosecond Laser-Assisted Cataract Surgery (FLACS)
- Post-op cataract complications
- LASIK in Review
- Post-op LASIK complications
- Innovations in corneal refractive procedures SMILE procedure
- Safety overview for minor surgical procedures: indications, surgical procedures. Instrumentation, anesthesia, asepsis & OSHA, medicolegal aspects, management of anaphylaxis & other complications
- Laser glaucoma procedures
- Gonioscopy review & ALT/SLT procedures
- YAG posterior capsulotomy
- Peripheral Iridectomy (PI)
- YAG cap, PI, ALT laser procedures (3-hr lab with proficiency)
- Minor corneal procedures: FB removal, amniotic membranes
- Corneal FB removal, lid speculum, pressure patch, amniotic membrane (2-hr lab with proficiency)
- Basic lid procedures e.g. chalazion, benign lesions
- Oculoplastic Procedures
- Glaucoma surgeries e.g. MIGS, trabs, tubes Retinal laser procedures e.g. PRP, macular grid Surgical Retinal Procedures
- Suturing and subdermal injections (2-hr lab with proficiency)

OPTM 8021 Sample Topics

- Injections
- Reclined BIO
- Scleral Depression BIO 3-Mirror Fundus Ocular Foreign Bodies Punctal Plugs
- Dilation & Irrigation
- Cataract Surgical Procedures
- Anterior Segment OCT Refractive Surgeries
- Fundus Auto Fluorescence Sample Assessments
- Demonstrate ability to perform the complete process of injections for IM
- Demonstrate ability to perform the complete process of injections for IV
- Perform complete process of specialty testing suite including Interpretation and Report
- Integrate specialty fundus exam techniques (scleral depression BIO and 3-Mirror fundus lens) suitably into ocular health evaluation
- Examine angles with four mirror lens
- Discuss the processes and procedures of ocular cataract surgeries
- Discuss the processes and procedures of corneal refractive surgeries
- Demonstrate ability to perform Anterior Segment OCT
- Examine the retina using FAF
- Perform the sequence of managing corneal foreign bodies
- Complete process of ultrasonography
- Safely implement punctal health procedures of dilation/irrigation and plugs

OPTM 6053 Sample Topics

- Laser Theory and Clinical Laser Applications
- Spontaneous emission
- Stimulated emission
- Three-level ruby laser
- Brewster windows
- Laser types
- Helium Neon laser
- Pulsed laser
- Mode locking
- Q-switching
- Lasers in eye care
- Laser tissue interaction
- Photocoagulation
- Photoablation
- Photodisruption

OPTM 6073 Sample Topics

- Surgical management
- Laser options
- Types of surgeries
- MIGS
- Consideration in selection of procedures

- Transitioning from medical to surgical options
- Future developments
- Anaphylaxis and other office emergencies
- Post-operative wound care

Example B: The Ohio State University School of Optometry

At The Ohio State University College of Optometry, in addition to basic systemic anatomy, physiology, pathology, and pharmacology coursework, our students also extensively study the structure, function, and pathology of the eye and orbit. This coursework is not taken by any medical student. Relevant highlights of our curriculum include (course outlines enclosed):

1. A detailed course in ocular anatomy with both didactic and hands-on laboratory inspection and dissection of the globe, histological examination of all ocular tissue, and examination of all nervous and vascular supply to the orbit. This course covers a complete tissue study of every layer and tissue of the lids, conjunctiva, and globe in addition to the anatomy of the orbit. This course comprises 50 hours of didactic lecture and 30 hours of hands-on laboratory work.

2. A detailed course in the physiology of the eye and orbit. This course covers all fluid dynamics of the globe, detail on all immunological and inflammatory mechanisms of ocular trauma, and a discussion of blood flow, lymphatic drainage, neural control, etc. This course comprises 50 hours of didactic coursework.

3. An extensive course in the optical structures of the eye discussing in detail the exact thicknesses, curvatures, changes of these structures over lifetime, measurements of these structures using instrumentation and interpretation of these images. This course is comprised 50 hours of didactic lecture and 30 hours of laboratory hands-on work.

4. A 28-hour course in the understanding of lasers and ionizing radiation and its interaction with human tissue. A 50-hour course in the clinical use of optical instruments such as slit lamp biomicroscopes, fundoscopy lenses, etc. with extensive training and practice in the precise use of these instruments and practical examinations ensuring that every student is proficient in the precise visualization and clinical interpretation of the health/pathology of each layer of the eye.

5. An extensive clinical rotation in which our students conduct complete vision examinations on patients under the direct supervision of licensed attending optometrists. These examinations typically include complete slit lamp biomicroscopic examinations of the eye and adnexa of each patient, thereby ensuring excellent skills in these procedures, e.g., examination and clinical interpretation of ocular tissues and treatment and management of inflammation and infection of any part of the visual system. At Ohio State each student currently completes approximately 1700 full eye examinations before graduation.

6. A 30-hour course in direct training (didactic and hands-on laboratory) in the area of lasers,

injections, and advanced procedures that has been approved by all states with advanced optometric scope as meeting the needed didactic and hand on procedures for licensure in those states.

7. A 17-week (40 hours per week) rotation in their fourth year in an ophthalmology office or surgical co-management site where students work directly with ophthalmologists in pre- and post-surgical care, thereby learning the diagnosis and treatment of complications of ophthalmic surgery, surgical candidate selection and observation of surgical procedures.

Example C: University of Alabama at Birmingham School of Optometry

The fundamental curricular contents required for advanced procedures, including ophthalmic laser surgical procedures, injections, and minor surgical procedures, are woven into the UAB School of Optometry curriculum from the 1st year of school and into the 4th, and include systemic and ocular anatomy, physiology, microbiology, pathology, biochemistry, pharmacology, management for conditions in eye care – with over 1000 hours of didactic and laboratory contact time for each student not including clinical encounters through clinical/patient care. In the first and second year of the program, optometry students take the same systemic curriculum as the dental students and medical students (Fundamentals in Health Sciences, Neuroscience, Gross Anatomy, Cardiovascular, Respiratory, Gastrointestinal, Musculoskeletal/Skin, Hematology, Endocrine, and Renal Systems) which was the design of the medical optometry curriculum from its inception in 1969.

2019-20	CONTACT HOURS
FUNDAMENTALS I	92
CLINICAL OPTICS	96
OCULAR ANATOMY	64
PHYSIOLOGY	64
BIOCHEM	24
FUNDAMENTALS II	92
SYSTEMS	290
OCULAR MICRO	16
VISUAL OPTICS	96
CEVS III (SLE, BIO, GONIO)	152
PHARM	64
ANT SEG	96
POST SEG	56
GLAUCOMA	24
NEURO	32
CLINICAL MANAGEMENT	48

TOTAL RELATED	1306
INJECTIONS MSP	48
LASERS	16.5
TOTAL RELATED	64.5

In order to ensure that students are able to apply fundamental concepts clinically, and perform surgical procedures, there are two required, stand-alone courses for injections/minor surgical procedures and ophthalmic lasers (OPT 326 and OPT 323), and have been since 2008 and 2012 respectively. These two courses account for an additional 46 contact hours. OPT 326 and OPT 323 were designed based on the broadest scope of optometric practice and utilize standardized high fidelity model-based practices to ensure safety and essential skills. The courses do not simply teach technical skills, but cover anatomy, pharmacology, clinical application, indications, contraindications and management of potential complications. Furthermore, faculty for the OPT326 and OPT 323 courses are only those who are certified in the surgical procedures.

Example D: Northeastern State University Oklahoma College of Optometry
Select Course Descriptions – NSU Courses with Surgical and Laser Correlates

5103 General Pharmacology
General principles of drug action and specific systemic treatment. Mechanisms of action and therapeutic guidelines for: autonomic drugs, anti-infective agents including those used for prophylaxis pre- and post-operatively, anti-inflammatory agents, agents used in the treatment of allergy, major drugs acting on the CNS, cardiovascular, kidney, and endocrine systems, agents used for local or infiltrative anesthesia and analgesia relevant to office-based procedures, antiseptic agents and common over-the-counter drugs. Adverse side effects and drug interaction of commonly prescribed pharmaceuticals.

4126 Geometric and Physical Optics
Imaging of light: ray tracing through optical systems; aberrations and optical systems design. Physics of light: sources, spectra, scatter, polarization, refraction, reflection, absorption, interference, diffraction. Theory behind diagnostic and therapeutic ophthalmic lasers. Lecture and laboratory.

4271 Interpersonal Communications

Interpersonal and interprofessional relationships. Creating and enhancing a professional image; communicating with patients; interpreting patient complaints and concerns; enhancement of patient understanding and compliance; interviewing and history taking techniques; referrals; surgical co-management; dealing with difficult patients.

5203 Ocular Pharmacology
Principles of ocular pharmacology and medical treatment, clinical administration of oral, topical, and injectable drugs and utilization of diagnostic agents in the clinical/surgical care of the eye and adnexa. Principles and specific management and treatment of ocular disease, trauma, anterior segment surgery, and laser treatment/surgery by systemic, local, and topical therapy, including antisepsis. Clinician responsibility in the treatment and management of ocular and systemic complications of pharmaceutical use.

4133 Clinical Immunology and Microbiology
A study of the cellular and biochemical aspects of the human immune system and the immune response to infectious disease. Abnormal immune responses will be discussed. Lectures will also cover microbial aspects of infectious diseases (including postoperative infections) caused by bacteria, viruses, fungi and parasites, with emphasis on pathogenic mechanisms, host-pathogen interaction and antimicrobial therapy.

7101 Systemic Therapy in Ocular Disease and Trauma
Basic systemic therapy in ocular disease. Clinical indications, dosage, drug interactions, and common complications of enteral and parenteral medications utilized in ocular disease. Management of surgical post-operative complications with systemic medications.

7132 Differential Diagnosis of Ocular Disease and Trauma
A review of ocular disease, including eyelid lesions, and trauma with emphasis on clinical presentation, adjunctive testing, differential diagnosis as well as treatment with oral agents, topical agents, office-based surgical procedures and therapeutic lasers.

6223 Strabismus and Amblyopia
Basic principles of strabismus and amblyopia. This will include the symptoms, signs, diagnosis, test administration, test data analysis and therapy with lenses/prisms, vision therapy, and surgical options including procedures, referral criteria and outcomes. Lecture and laboratory.

5183 Optometric Clinical Methods III
This course emphasizes instrumentation and procedures for the detection, diagnosis, and management of pathological conditions. Includes introduction to office-based surgical procedures. Credit will not be awarded for Optometry 5183 until the pre-clinical examination has been completed successfully. Lecture and laboratory.

4213 The Human Nervous System
Structure and function of the central, peripheral, and autonomic nervous systems including anatomic correlates to periocular sensory anesthesia. Particular emphasis is placed on the anatomy and physiology of the visual system as it applies to the processing of visual information. Lecture and laboratory.

6081 Optometric Case Studies I
Case presentation and a discussion of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

6251 Optometric Case Studies II
Case presentation and a discussion of selected topics including optometric surgical and laser procedures in optometric clinical care by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

7081 Optometric Case Studies III
Case presentation and a discussion of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

7171 Optometric Case Studies IV
Case presentations and discussions of selected topics in optometric clinical care including optometric surgical and laser procedures by faculty, students, and invited speakers. Current literature will be explored which applies to the subjects under discussion.

5273 Ocular Disease I:
Cataracts, Corneal, and External Ocular Disease Epidemiology, pathophysiology, differential diagnosis, management, and treatment of cataract, corneal and external ocular diseases, including disorders of the crystalline lens, eyelids, lacrimal

system, conjunctiva, cornea, sclera and episclera. Includes cataract pre-operative and post-operative care as well as indications for treatment of posterior capsular haze with the Nd:YAG laser. Also includes instruction of office-based surgical procedures for the treatment and relief of ocular abnormalities.

5291 Clinical Practice I
Performance of clinical procedures and observation with case discussion. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes observing and assisting faculty, residents and upper-class students with office-based minor surgical procedures, including anterior segment laser procedures.

6093 Clinical Practice II
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office based surgical procedures, including anterior segment laser procedures.

6195 Clinical Practice III
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office based surgical procedures, including anterior segment laser procedures.

6295 Clinical Practice IV
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, including anterior segment laser procedures.

7095 Clinical Practice V
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within clinical and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

7196 Clinical Practice VI
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems. Optometric examinations conducted under the supervision of clinical faculty within
clinical and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

7293 Clinical Practice VII
Clinical practice under supervision of clinical faculty in the screening, examination, diagnosis, treatment, and management of vision conditions and other health problems in on- and off-campus clinics. Optometric examinations conducted under the supervision of clinical and adjunct faculty within clinical, private practice and hospital settings. Includes performance of office-based surgical procedures, biopsy and anterior segment laser procedures.

6231 Optometric Clinical Methods IV
Course topics covered include instrumentation and technical skills necessary for surgical procedures performed in the primary eye care setting. Includes OSHA regulations pertaining to blood borne pathogens. Included techniques are: asepsis, iv injections, fluorescein angiography, management of anaphylaxis, wound management, basic suturing, and in-office minor surgical procedures. The course discusses the indications for, alternatives to, and risk/benefits of all techniques, as well as the management of complications. The course includes lecture and hands on participation.

4264 Ocular Anatomy and Physiology
Gross and microscopic anatomy of the orbit and its contents including the globe, muscles, bone structure, blood and nerve supplies; embryology, histology, anatomy and physiology of the eye including the chemical composition, metabolic activities; physiological functions of the various tissues of the eye and related structures including sensory and motor innervation of the face and biomechanics of the eyelid as relevant to office-based eyelid surgical procedures. Lecture and laboratory.

7042 Office–Based Surgery
The role of office-based surgical practice within the comprehensive scope of current optometric practice. Application of evidence-based medicine and basic science human anatomy to office- based surgical patient selection, planning, instrumentation, procedures, anesthesia, and pre- and post-operative care.

7031 Ophthalmic Applications of Lasers
Laser biophysics, hazards, safety precautions, indications and contraindications for specific procedures, performance of the procedures, and follow-up care including management of complications are reviewed.

Example E: University of Pikeville, Kentucky College of Optometry

OPT 715 Advanced Topics in Ocular Disease Management
This course is a continuation of OPT 628. It includes discussion of advanced procedures and recent discoveries pertaining to the detection, diagnosis and management of posterior segment disorders.

OPT 716 Glaucoma Diagnosis & Management
This course is a comprehensive presentation of primary and secondary glaucomas, including etiology, mechanisms, prevalence and classification. The course emphasizes diagnostic testing including the use of advanced technologies, imaging procedures, photographic techniques and management options including medical, surgical and laser procedures.

OPT 717 Inter-Professional Clinical Case Analysis & Management
Clinical cases involving multi-disciplinary involvement will be presented. Participation will include discussion by physicians, nurses, pharmacists, social workers, public health personnel, and other professional personnel as well as optometrists to exemplify and provide proper sequential and/or parallel management and arrive at an integrated approach in solving the patient's issues.

OPT 722 Epidemiology and Research Methodology Epidemiology
Discusses the factors that concern the frequency of occurrence of certain eye diseases or conditions among a defined population, particularly rural areas of Appalachia and other rural areas in America, and their effect on the health and well-being of their patients. It discusses screening, standards of care and reviews major epidemiological eye studies together with those determinants that contribute to ocular diseases and conditions in aging and poverty. Other topics include those factors that contribute to or worsen the effect of visual impairment such as pharmacological factors or cognitive impairment in the aged population or psychological factors in the young. There is also a detailed analysis of health care policy. Research Methodology covers development of a research question, experimental design, specific aims and statistical analysis, writing of the research proposal, grant applications, regulatory requirements related to human subject and

animal research, CITI and other mandatory training for carrying out research and clinical trials, presentation of papers and posters and publication in refereed journals.

OPT 723 Clinical Internship IV
The student continues supervised clinical patient care with emphasis on the intern delivering care in the role of the provider. Asin Clinical Internship III, care issupervised by KYCO clinical faculty and will take place mainly in the KYCO primary care clinics within the College and at one or more KYCO network clinics. Case conferences and Grand Rounds experiences will be assigned. Emphasis is upon correct interpretation and management of refractive and disease cases that have moderate complexity.

OPT 725 Neuro-Ophthalmic Disease, Neurological Disorders & Acquired Brain Injury
This course provides an in-depth discussion of the diagnosis of and management strategies for various neurological disorders that can affect vision and visual perception. Other systemic conditions such as some of vascular or cardiac etiologies or space-occupying lesions of the brain may also contribute to visual abnormalities or loss. Testing and neurological evaluation is discussed in depth and is accompanied by various radiological and other technologies that help the diagnostic process. The diagnostic strategies for the confirmation of acquired brain injuries are also covered in detail.

OPT 726 Clinical Medicine & Systemic Disease: Management & Co-Management
This course covers the major systemic diseases that have ocular and visual implications and reviews their etiology as discussed in pathology, the patient's signs and symptoms and other clinical assessments in order to not only reach a definitive diagnosis but also develop effective management plans. Since many systemic diseases have ocular correlates or implications, management often takes the form of co-management. The course will emphasize certain diseases such as diabetes, cardiovascular disorders, infectious and other conditions prevalent in the general and Appalachian populations.

OPT 727 Ophthalmic Surgery I: Laser Procedures
This course provides instruction and laboratory experience in advanced ocular therapeutic laser procedures. Topics will include a review of laser physics, tissue interaction, laser hazards and safety, and laser treatment protocol. As part of this

course, students will perform simulated laser treatments as well as receive instruction for providing pre and post-operative patient care in preparation for the clinical application of these procedures.

OPT 728 Optometry Review I
This course will review basic concepts focusing on the content presented in past and ongoing courses coordinated with the matrix outlined by the National Board of Optometry and the Accreditation Committee on Optometric Education. Targeted topics include principles of optics, general and ocular pharmacology and pharmacogenetics, and systemic and ocular disease. The goal of the course is to help participants prepare for their national board and state licensure exams, driving the course content.

OPT 731 Pre & Post-Operative Management of Ophthalmic Surgery Patients
This course presents the evaluation and management, including surgical decision-making in the care of the pre-operative candidate patient for ophthalmic surgery. All pre-surgical testing, counselling and preparation of the patient is presented as are the post-operative procedures, medications, and device management.

OPT 732 Advances in Optometry & Ocular Imaging
This seminar course is intended for presentations on contemporary and future innovations in the practice of optometry from the development of new technologies and instrumentation, to better management strategies, research in pharmacogenetics, detection of markers predictive of disease, pharmaceutical discoveries and better optical solutions to current refractive disorders. A wide array of advanced corneal and refractive imaging systems devices will also be introduced.

OPT 733 Clinical Internship V
Continuing supervised clinical patients care with emphasis upon the intern delivering care in the role of the provider. Care will be supervised by KYCO clinical faculty and will take place mainly in the KYCO primary eye care clinics within the College and at one or more KYCO network clinics. Case conferences and grand round experiences will be assigned. Emphasis is upon correct interpretation and management of refractive and disease cases that have high complexity.

OPT 735 Ophthalmic Surgery II: Injections & Periocular Surgery
This course provides an introduction to minor periocular surgical procedures including informed consent, OSHA guidelines and asepsis, sterile techniques, lesion removal, and post-operative wound care. Various techniques, including

radiofrequency surgery will be discussed. Injection topics include indications and techniques for periocular injections, venipuncture, local anesthesia, and emergency procedures for anaphylaxis.

OPT 811, 812, 813, 821, 822, 823, 831, 832, & 833 Clinical Externships
The fourth year rotations occur within the KYCO clinical network and include direct supervised patients care in the Primary Eye Care clinics with rotations to appropriate clinical facilities for direct and observed supervised clinical experience in specialty eye diseases, contact lenses, pediatrics, low vision, ophthalmic dispensing services as well as observational participation in other medical specialty clinics. Clinical management by interns during the fourth year is expected to reflect an ability to evaluate and manage a complex case load including surgical care.

Recent scope expansions

All states have updated their optometric practice acts over the years to some extent, e.g. prescriptive authority and foreign body removal. Other states permit some if not all the latest procedures being taught in optometry programs today.

Scope of Optometric Practice in 2020

The scope of optometric practice in the U.S. continues to evolve. State practice acts define what is included in care delivered by doctors of optometry. Some states have kept pace with expanding health care and clinical technologies and have updated individual practice acts to reflect the evolving health care landscape. Emerging clinical procedures- often referred to in statutes as 'advanced procedures' - and new therapeutic treatment options are currently allowed in some, but not all, states throughout the country.

Several states currently have optometric practice acts which include in their scope the ability to perform ophthalmic surgery such as but not limited to: injections of diagnostic and therapeutic pharmaceutical agents; drainage and/or removal of eyelid chalazia, cysts, abscesses, bullae and seroma; excision and biopsy of cutaneous lesions; repair of eyelid lacerations, removal of foreign bodies of the cornea and conjunctiva; probing/irrigation of the lacrimal drainage structures; the use of ultraviolet, visible, and infrared radiation for treatment of specific ocular conditions; and the use of radiofrequency and thermal cautery.

The term "ophthalmic surgery" is recommended as a description of skills doctors of optometry should possess in order to meet the needs of the patient population adequately. These procedures may be routinely performed in the typical office of a

doctor of optometry, as surgical procedures and the management of their possible complications fall well within the established optometric curriculum, assessment tools, and documentation of the Association of Schools and Colleges of Optometry institutions.

The document below was developed to establish general guidelines for all optometry schools/colleges to reflect the current state of ophthalmic surgery in 2020. For states that already permit these advanced procedures, optometry schools/colleges had to submit legal affidavits stating that their curriculums covered training on these procedures. Every school/college in the U.S. has submitted legal affidavits to those state licensure boards testifying that they do teach and educate their graduates to perform these procedures.

Framework for Developing Optometric Curriculum Guidelines and Educational Standards for Ophthalmic Surgery

Process

The framework draws substantially from the Accreditation Council for Graduate Medical Education (**ACGME**) core competencies, the previously mentioned ASCO 2011 "Attributes" Report, the ASCO Functional Standards for Optometric Education referenced during the admissions process at all schools and colleges of optometry, Accreditation Council on Optometric Education (**ACOE**) standards for the professional optometric degree, Northeastern State University Oklahoma College of Optometry (**NSUOCO**) Surgical Anatomy and Introduction to Office-based Surgery (OPT 7042) Course, and coursework of Southern College of Optometry, and the Illinois College of Optometry.

The framework does not specify an exact number of credit hours, contact hours, observations or performed procedures. Educational research over the past two decades has advanced our knowledge of learning and techniques best suited to facilitate learning. The strategies and methods recommended today are not limited to the strategies of the past. Thanks to the emergence of new technology-based educational tools, we can now offer today's learner a more valuable experience based on interaction and experimentation.[9] Studies have demonstrated that authentic learning activities support the acquisition of knowledge that cultivates the kinds of skills that are lasting and more portable.[13]

The three pillars for the core competencies for entry-level ophthalmic surgery include: **1) Professional Values and Ethics; 2) Knowledge; and 3) Skill**. Each core competency is accompanied by a list of suggested objectives which provide examples of activities to measure knowledge, skill, and outcomes. **The framework is a starting point and is not meant as a prescriptive list of activities to restrict, limit, or regulate.** In fact, the project team looks forward to broad engagement and discussion with stakeholders to facilitate implementation.

The "skills" competencies expand upon the entry-level student learning outcomes in the 2011 ASCO Attributes Report, which include: "...the ability to prescribe or use ophthalmic materials, contact lenses, vision therapy, low vision devices, pharmaceuticals, and certain surgical procedures, to treat and otherwise manage common vision disorders and disease,[4] "and specific procedures utilizing injections, biopsy, excision, curettage, irrigation, ultraviolet radiation, radiofrequency and thermal cautery, to treat and manage vision disorders and disease.

A. Professional Values and Ethics

A.1. Expected to provide patient care that is compassionate, appropriate, and effective for the promotion of health and the treatment of health problems.

A.1.1 Be respectful and responsive to individual patients' preferences and needs, and ensure their values guide all clinical decisions[1]

A.1.2 Be mindful and apply varying dimensions of compassion including attentiveness, active listening, helping, and understanding[2]

A.2. Expected to demonstrate the ability to investigate and critically evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on perpetual self-evaluation and life-long learning.[3,4]

A.2.1 Identify strengths, deficiencies, and limits in one's knowledge and expertise

A.2.2 Systematically analyze practice using quality improvement methods and implement changes with the goal of practice improvement

A.2.3 Incorporate formative evaluation feedback into daily practice

A.2.4 Employ evidence-based practice and participate in learning and research activities to the extent possible[7]

A.2.5 Working knowledge of applicable Clinical Practice Guidelines (AOA) and Preferred Practice Patterns (AAOphthalmology)

A.2.6 Set learning and improvement goals

A.3. Demonstrate a commitment to fulfilling professional responsibilities and an adherence to ethical principles.

A.3.1 Responsiveness to patients needs that supersede self-interest

A.3.2 Compassion, integrity, and respect for others

A.3.3 Demonstrate commitment to continuity of surgical care

A.3.4 Accountability to patients, society and the optometric profession

A.3.5 Refer to and make visible the Optometric Oath as a resource guiding clinical practice

philosophy

A.3.6 Adherence to patient privacy and protection policies

A.4. Participate in identifying system errors and implementing potential systems solutions, including participation in disease and clinical registries and government reporting programs as appropriate.

A.4.1 Apply quality improvement to identify hazards in patient care with the objective to improve outcomes[7]

A.4.2 Participate in a qualified clinical data registry, like AOA MORE

A.4.3 Participate in prescription monitoring programs (PMP)

A.4.4 Awareness of reporting options and requirements to state, regional, or national authorities

A.4.5 Maintenance of procedure logs in various practice settings

A.4.6 Report adverse outcomes in ophthalmic surgery as part of quality assurance

B. <u>Knowledge</u>

B.1. Expected to demonstrate knowledge and application of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences to patient care.

B.1.1 Must demonstrate competence in their knowledge of basic and clinical sciences specific to optometry and ophthalmic surgery

B.1.2 Evidence-based medicine

B.1.3 Outcomes-based registries

B.2. Able to implement appropriate infection control, cleaning, and sterilization protocols, as well as biohazardous waste disposal procedures.

B.2.1 Aseptic technique

B.2.2 Awareness, implementation, and documentation of applicable OSHA requirements

B.2.3 Personal protective equipment/barriers for patient and provider

B.3. Expected to demonstrate an understanding of Applied Basic Sciences.

B.3.1 Integration and clinical application of anatomy, physiology, hemostasis, histopathology, and pathophysiology. Describe actions, mechanisms, and applications of relevant pharmacological and anesthetic effects on organ systems and adverse reactions

B.3.2 Familiarity with the principles of energy-tissue interactions including laser, visible ultraviolet and infrared light, electrocautery and radiofrequency sources

B.4. Demonstrate knowledge of intra and postoperative complications and how to manage them.

B.4.1 Hemorrhaging

B.4.2 Infection

B.4.3 Intraocular hypertension

B.4.4 Inflammation

B.4.5 Anesthesia and anesthesia-related adverse events

B.4.6 Adverse pharmaceutical reactions including anaphylaxis

B.4.7 Wound healing complications

B.4.8 Other potential complications, relevant to the procedure

B.5. Expected to understand ophthalmic surgical instrumentation, including its purpose, design, intended use, and related equipment and supplies.

B.5.1 Equipment for injection
B.5.2 Wound closure
B.5.3 Surgical instrumentation
B.5.4 Ophthalmic lasers
B.5.5 Radiosurgical technology
B.5.6 Personal protective equipment for providers and patients
B.5.7 Sterilization of surgical equipment
B.5.8 Asepsis and sterile field creation
B.5.9 Ancillary equipment and supplies

B.6. Working knowledge of the laws and regulations relating to ophthalmic surgery.
B.6.1 Occupational Safety and Health Administration (OSHA)
B.6.2 State scopes of practice
B.6.3 Centers for Medicare and Medicaid Services (CMS)
B.6.4 Appropriate coding and billing practices
B.6.5 Accreditation and credentialing – e.g., Accreditation Council on Optometric Education (ACOE), American Board of Optometry (ABO), Joint Commission (surgery centers, and hospitals)
B.6.6 Stark and anti-kickback statutes
B.7. Demonstrates an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.[14]
B.7.1 Work effectively in various health care delivery settings and systems relevant to their clinical discipline
B.7.2 Coordinate patient care within the health care system relevant to their clinical discipline
B.7.3 Advocate for quality patient care and optimal patient care outcomes
B.7.4 Incorporate considerations of cost awareness and risk-benefit analysis inpatient and/or population-based care as appropriate
B.7.5 Work in inter-professional teams to enhance patient safety, care and improve quality
B.7.6 Participate in identifying system errors and implementing potential systems solutions

C. Skills

C.1. Ability to obtain an appropriate case history and proper informed consent
C.2. Be able to properly document an ophthalmic surgical procedure report following the standards set by the JCAHO and AAAHC for sufficient information to:
C.2.1 Identify the patient
C.2.2 Support the diagnosis
C.2.3 Justify the treatment
C.2.4 Document the postoperative course and results
C.2.5 Promote continuity of care

C.3. Appropriately evaluate and assess the ophthalmic and general medical indications and contraindications for ophthalmic surgery in order to obtain a valid informed consent, including alternatives, risks, benefits, and limitations or contraindications.

C.4. Provide acute and long-term post-procedure care for ophthalmic surgery.
C.4.1 Management and/or treatment of adverse events

C.4.2 Maximizing procedural outcomes and systematic assessment for quality improvement
C.4.3 Sequelae of procedure complications
C.4.4 Wound healing
C.4.5 Medications
C.4.6 Necessity for further or ongoing intervention or consultation

C.5. Manage acute and chronic complications which may be associated with ophthalmic surgery and anesthesia.
C.5.1 Supportive training (e.g., CPR, Basic Life Support)
C.5.2 Ability to manage early and late stage wound complications
C.5.3 Ability to identify and respond to intra and postoperative systemic complications.
C.5.4 Ability to utilize resuscitative equipment

C.6. Expected to demonstrate the psychomotor skills and ASCO Functional Standards necessary to safely and effectively perform procedures.
C.6.1 Coordination and control of activity in free space and/or through magnification and illumination (e.g., manual dexterity, eye-hand coordination, and kinesthetic sense)

C.7. Expected to demonstrate appropriate use, indication, and action of ophthalmic ultraviolet, visible, and infrared radiation LASER procedures
C.7.1 Trabeculoplasty
C.7.2 Post-cataract capsulotomy
C.7.3 Peripheral iridotomy
C.7.4 C.6.4 Refractive corneal modification for purposes of refractive changes

C.8. Expected to demonstrate appropriate use, indication, and action of ophthalmic radiofrequency and thermal cautery procedures
C.8.1 Procedural hemostasis
C.8.2 Lesion removal

C.9. Expected to demonstrate the psychomotor and cognitive skills necessary to perform nasolacrimal procedures
C.9.1 Punctal dilation and irrigation
C.9.2 Lacrimal probing
C.9.3 Punctal occlusion
C.9.4 Punctoplasty

C.10. Expected to demonstrate the psychomotor and cognitive skills necessary to perform corneal procedures
C.10.1 Foreign body (FB) removal
C.10.2 Epithelial debridement
C.10.3 Emergent paracentesis
C.10.4 Cornea/Photorefractive Keratectomy
C.10.5 Cornea/Collagen cross-linking
C.10.6 Microstromal puncture

C.11. Expected to demonstrate the psychomotor and cognitive skills necessary to perform

conjunctival procedures
C.11.1 FB removal
C.11.2 Lymphatic cyst removal
C.11.3 Granuloma removal
C.11.4 Biopsy

C.12. Expected to demonstrate the psychomotor and cognitive skills necessary to administer local and topical anesthesia effectively
C.12.1 Local anesthesia toxicity and management
C.12.2 Allergic reaction and anaphylaxis
C.12.3 Infiltrative local anesthesia
C.12.4 Regional anesthesia

C.13. Expected to demonstrate the psychomotor and cognitive skills necessary to perform injection techniques effectively
C.13.1 Intradermal
C.13.2 Subcutaneous
C.13.3 Subconjunctival
C.13.4 Intralesional
C.13.5 Intramuscular
C.13.6 Venipuncture
C.13.7 Intraocular

C.14. Expected to demonstrate the psychomotor and cognitive skills necessary to perform procedures on the lids and adnexa effectively
C.14.1 Suture techniques, including suture removal
C.14.2 Lesion excision, scalpel, scissors, dermablade, currette
C.14.3 Lesion incision and curettage
C.14.4 Cutaneous lesion biopsy
C.14.5 Intralesional injection
C.14.6 Lesion radiosurgical destruction
C.14.7 Laceration repair
C.14.8 Everting lid sutures for involutional entropion

C.15. Expected to demonstrate effective, culturally competent, interpersonal communication skills, oral and written, that result in a clear understanding of health information by patients, their families, and health professionals which result in meaningful outcomes for the patient
C.15.1 Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
C.15.2 Communicate effectively with physicians, other health professionals, and health related agencies
C.15.3 Maintain comprehensive, timely, and legible electronic, or paper, health records, where applicable
C.15.4 Act in a consultative role to other physicians and health professionals
C.15.5 Work effectively as a member or leader of a health care team or other professional groups

[i] https://www.aoa.org/AOA/Documents/Advocacy/HPI/HPI%20Medicare%20Physician%20Utilization.pdf

Optometry's Essential and Expanding Role in Health Care: Assured Quality and Greater Access for Healthier Communities

White Paper

June 12, 2019

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EXECUTIVE SUMMARY

A two-decade drumbeat of bold, future-focused and entirely bi-partisan changes in U.S. state laws has ushered in the modern practice of optometry. The result has been a dramatic expansion of the profession's independent physician role in health care coupled with the increased ability of those in need of eye health and vision care to directly access personalized quality, comprehensive eye health care provided by doctors of optometry in their home communities through a choice of practice settings.

Since 1998, state affiliates of the American Optometric Association have supported and played a positive role in enacting 62 laws in 47 states expanding optometric scope of practice, in turn, granting tens of millions of patients the ability to select doctors of optometry for their essential medical eye health and vision care. Over the same period of time, associations covering all 50 states and the District of Columbia, successfully reduced insurance restrictions and eliminated other barriers to access to doctors of optometry chosen by a patient, including the enactment of powerful "any willing provider" laws. State association advocacy has also resulted in patient safety laws in 23 states, protecting the public from online vision tests, illegal contact lens sales and other dangerous health and medical device-related scams.

This policy direction reflects the notably positive trust relationship between doctors of optometry and their patients and, more broadly, the increasing public recognition of doctors of optometry as the primary eye care providers for families, often delivering care across generations, while practicing in more than 10,176 communities nationwide or counties accounting for 99 percent of the total U.S. population. At the same time, there remain outdated, misguided, politically-influenced and even arbitrarily-drawn laws in the majority of states still imposing harsh burdens on patients by delaying or denying critical access and continuity of care, all at significant individual and systemic cost.

As was the case with successful advocacy-inspired updates to state practice acts prior to 1998 (see Appendix A), in virtually all instances, opposition to optometric scope expansion is typically limited to the specific health care special interests that face increased economic pressures arising from it. By 2019, their decades-old reflexive and diversionary opposition, based on an array of false claims, is facing new scrutiny, even becoming the focus of competition and "cease and desist" directives (see Appendix B) from the public health and patient advocacy community.

In this report, we explore the main benefits of state optometric scope of practice expansion and provide a logical framework through which to assess the value of scope of practice expansion. This report is divided into four sections: Introduction, Analysis, Cost-Benefit, and Public Perception.

The Analysis section documents the need for improvements in access to eye health and vision care, and discusses the literature supporting the ten important domains that form the basis for the value

proposition underlying scope of practice expansion. The Cost-Benefit section provides a simple model to derive the monetary value of scope of practice expansion. We determined that scope of practice expansion adds $600 million per year in transaction costs savings and another $4 billion per year in savings attributable to access-related improvements in health outcomes. Finally, the public perception survey found that nearly all voters nationwide consider having access to eye health and vision care a priority; 96% of voters deemed it as either very or somewhat important. Americans want access and ease. In sum, this research provides strong support for scope of practice expansion for doctors of optometry in the U.S.

1. INTRODUCTION

1.1. Numerous forces are placing increasing demands on the health care system in the U.S., including general population growth, the rising mean age of the population, and the increasing dispersion of the population into areas that are more difficult to serve, such as urban, rural, and "exurb" communities.[1] For instance, the incidence of obesity has risen in the U.S. over the past 30 years where now 71.6% of American adults[2] aged 20 and over are considered overweight or obese. This trend is alarming considering obesity is associated with a higher incidence of chronic diseases, including diabetes, cardiovascular disease and cancer. In the case of eye health and vision care, ocular comorbidities have also risen as the rates of obesity and diabetes rise sharply. Additionally, the passage of the Affordable Care Act (ACA), which mandated specific provisions for comprehensive vision care through the essential health benefits, has added more insured individuals to the market, and these newly insured individuals will begin consuming health care resources at a higher rate. This effort by policy makers is only reinforced by the U.S. Department of Health and Human Services (HHS) report from this year, which notably says "states should consider changes to their scope of practice statutes to allow all health care providers to practice to the top of their license, utilizing their full skill set." At the same time, there are rising concerns that pressures on demand are fast exceeding the supply of medical care providers. Consequently, policy makers have in recent years increased their efforts to bolster the supply of well-trained high quality providers and create a more efficient system capable of handling the pressures on demand.

1.2. Eye care is more than simply ancillary care, it is essential care. Consider that most eye and vision problems tend to worsen with age or if left untreated, while concomitantly causing patients considerable anxiety, discomfort and reduced overall quality of life.[3] In fact, Americans are more than twice as likely to worry about losing their vision than they are the next highest worry, losing their memory.[4] This is especially poignant given the

[1] For different reasons, each of these geographic distinctions present supply challenges. For urban areas, the problem is often encouraging providers to locate there. This may not be a problem in large growing cities, but can be a problem in cities where growth is static. In the case of rural areas and exurbs, the problem is largely one of travel distance and the density of providers.

[2] Centers for Disease Control and Prevention, "Selected Health Conditions and Risk Factors, by Age: United States, Selected Years 1988-1994 through 2015-2016," (2017).

[3] See generally B. B. Gauer et al., "Access, Provision, and Cost of Routine Eye Care: A Comparison of Oregon Optometrists and Ophthalmologists," *J Am Optom Assoc* 65, no. 4 (1994); K. A. Kirtland et al., "Geographic Disparity of Severe Vision Loss - United States, 2009-2013," *MMWR Morb Mortal Wkly Rep* 64, no. 19 (2015); Engineering National Academies of Sciences et al., "The National Academies Collection: Reports Funded by National Institutes of Health," in *Making Eye Health a Population Health Imperative: Vision for Tomorrow*, ed. A. Welp, et al. (Washington (DC): National Academies Press (US) Copyright 2016 by the National Academy of Sciences. All rights reserved., 2016).

[4] American Eye-Q® survey: The American Optometric Association commissioned a 20-minute, online survey among a nationally-representative sample of n=1,002 U.S. adults ages 18+. The margin of error for

public's ever-greater awareness of the toll that Alzheimer's disease and dementia, and cognitive decline, exact on America's seniors. Moreover, when asked who they trust most for accurate, reliable information on their eye health, Americans are more than twelve times as likely to turn to their eye doctor than their primary care physician.[4] Many Americans already regard their doctor of optometry as fulfilling their primary eye care provider needs, yet many states' scope of practice acts unnecessarily limit these highly trained providers from truly satisfying that capacity. The current, doctoral level education and advanced training that doctors of optometry receive in accredited schools and colleges of optometry nationwide are often curtailed arbitrarily and without merit by some states' scope of practice acts to little more than comprehensive eye examinations. These providers have the education, clinical experience and ability to furnish expanded, high-impact services, such as prescribing relevant pharmaceuticals by any route of administration, administering injections, and providing a range of advanced surgical procedures. These scope of practice expansions have been shown to improve quality and increase access to care.

1.3. The overall objective of this report is to demonstrate the value and benefits of scope of practice expansion. The remainder of the report is divided into three sections. The "Analysis" section (2.0) is titled as such because it extends beyond a simple literature review and ties together the key domains that establish the rationale and value for scope of practice expansion. Ten key domains are analyzed: (1) demand, (2) supply, (3) training, (4) quality, (5) productivity, (6) competition, (7) access, (8) scope of practice, (9) advanced procedures, and (10) transaction costs. A simple cost-benefit model is presented in Section 3.0. The model estimates transaction cost and outcomes-related savings associated with scope of practice-driven access expansion. Finally, Section 4.0 presents the results of a new public opinion survey on the perceived value of doctors of optometry among voters, illustrating and adding further support to many of the concepts discussed in Sections 2.0 and 3.0.

this sample is +/-3.1% at the 95% confidence level. The survey was fielded between November 3 and November 9, 2017.

2. ANALYSIS

2.1. *Demand*. Doctors of optometry can meet the increased demand for eye health services that is projected in conjunction with the overall demand for health care services as reflected by several important trends. Chiefly among these, the burgeoning population of older Americans; the demand for medical services accelerated by the passage of the ACA; and swelling obesity figures that have given rise to a public health emergency of type 2 diabetes diagnoses. Seeing an eye doctor regularly reduces the risk of vision loss for individuals with diabetes, but only about 2/3 of those individuals get that care.[5] As primary eye care providers, doctors of optometry can affect a meaningful difference through the timely detection, intervention, treatment and monitoring of these patients. This impact is no more apparent than when considering that at least 276 systemic diseases have ocular manifestations that can be discovered during a comprehensive eye examination that – when combined with optometry's geographic accessibility – poise doctors of optometry to substantially contribute to Americans' primary health care. Consider, the most impactful trend on overall health care demand: the aging population.[6] Older individuals are higher users of virtually all types of medical services, especially advanced care, and the aging of the population has resulted in growth in overall demand for medical care.[7] Among the vision disorders with which Americans 60 and older must contend are age-related macular degeneration (AMD), cataracts and glaucoma. If not immediately addressed, these conditions, the signs of which go unnoticed in the early stages by most patients, gradually deteriorate vision in a population already at high risk of morbidity or mortality from falls.[8] Another important sector-wide increase in demand for medical care is attributable to the passage of the ACA, including the state Medicaid expansion that accompanied it. Specific to eye care, the growing obesity epidemic and the concomitant rise in the number of individuals with type 2 diabetes has led to an increase demand for eye care related to diabetic retinopathy.[9] More than 100 million U.S. adults are now living with diabetes or prediabetes, according to the Centers for Disease Control and Prevention (CDC).[10] Diabetic retinopathy can lead to visual impairment and blindness if not diagnosed and treated in an appropriate timeframe. Diabetic retinopathy

[5] Centers for Disease Control and Prevention, "Diabetes Report Card 2017," ed. US Dept of Health and Human Services (Atlanta, GA2018).
[6] J. R. Knickman and E. K. Snell, "The 2030 Problem: Caring for Aging Baby Boomers," *Health Serv Res* 37, no. 4 (2002).
[7] See generally H. Moses, 3rd et al., "The Anatomy of Health Care in the United States," *Jama* 310, no. 18 (2013).
[8] Elizabeth Burns; Ramakrishna Kakara, "Deaths from Falls among Persons Aged ≥65 Years — United States, 2007–2016," *Weekly* 67, no. 18 (2018).
[9] For example, see P. A. Maclennan et al., "A Survey of Alabama Eye Care Providers in 2010-2011," *BMC Ophthalmol* 14 (2014); National Academies of Sciences et al.
[10] CDC, "National Diabetes Statistics Report, 2017," in *Estimates of Diabetes and Its Burden in the United States* (Washington, D.C.: Centers for Disease Control and Prevention, 2017).

remains the leading cause of blindness among working-age U.S. adults, principally due to lack of a regular source of care.[11]

2.2. *Supply*. Despite this aforementioned demand, the supply of medical care providers in the U.S. has largely failed to keep up,[12] especially regarding the supply of primary care providers.[13] The same may be said of the supply of specialists and surgeons, as well.[14] While some estimates describe a shortfall of as many as 90,000 physicians (divided equally between primary and specialty care)[15] – a level that seems difficult to compensate within the supply constraints of current physician training programs in the U.S. – the near opposite is true of optometry's projected workforce. Even accounting for the aforementioned increased demand for services, there is an adequate supply of doctors of optometry, inclusive of projections of new doctors, to meet current and projected demand for eye care services through 2025.[16] In fact, data shows doctors of optometry view themselves able to accommodate much of the expected increase in demand by an average of 19.8 additional patients per week without adding additional hours to their practices. While the shortfall in medical providers is national in scope, low-income, urban and rural areas are disproportionately affected.[17] Moreover, in the U.S. there has been rapid population growth in small metropolitan areas and what are referred to as "exurbs"—large non-urban areas typically longer distances from city centers.[18] These areas have rapidly become a concern for public health experts, as these areas typically have very low densities

[11] Y. Liu et al., "Factors Influencing Patient Adherence with Diabetic Eye Screening in Rural Communities: A Qualitative Study," *PLoS One* 13, no. 11 (2018).

[12] See generally S. Collins, "Primary Care Shortages: Strengthening This Sector Is Urgently Needed, Now and in Preparation for Healthcare Reform," *Am Health Drug Benefits* 5, no. 1 (2012); A. Friedman et al., "A Typology of Primary Care Workforce Innovations in the United States since 2000," *Med Care* 52, no. 2 (2014); D. G. Kirch, M. K. Henderson, and M. J. Dill, "Physician Workforce Projections in an Era of Health Care Reform," *Annu Rev Med* 63 (2012); Knickman and Snell; C. Marchand and S. Peckham, "Addressing the Crisis of Gp Recruitment and Retention: A Systematic Review," *Br J Gen Pract* 67, no. 657 (2017); M. C. McCarthy et al., "Meeting Increasing Demands for Rural General Surgeons," *Am Surg* 81, no. 12 (2015); E. Salsberg and A. Grover, "Physician Workforce Shortages: Implications and Issues for Academic Health Centers and Policymakers," *Acad Med* 81, no. 9 (2006).

[13] For example, see Collins; Friedman et al; Marchand and Peckham.

[14] For example, see McCarthy et al; T. R. Russell, "The Surgical Workforce: Averting a Patient Access Crisis," *Surg Clin North Am* 87, no. 4 (2007); G. F. Sheldon, "Workforce Issues in General Surgery," *Am Surg* 73, no. 2 (2007).

[15] Kirch, Henderson, and Dill.

[16] The Lewin Group, "Eye Care Workforce Study: Supply and Demand Projections" 2014.

[17] See generally R. S. Baker et al., "Access to Vision Care in an Urban Low-Income Multiethnic Population," *Ophthalmic Epidemiol* 12, no. 1 (2005); B. R. Casey et al., "Rural Kentucky's Physician Shortage: Strategies for Producing, Recruiting, and Retaining Primary Care Providers within a Medically Underserved Region," *J Ky Med Assoc* 103, no. 10 (2005); L. A. Hark et al., "Improving Access to Vision Screening in Urban Philadelphia Elementary Schools," *J aapos* 20, no. 5 (2016); Kirtland et al; M. R. Wilson and D. R. Eezzuduemhoi, "Ophthalmologic Disorders in Minority Populations," *Med Clin North Am* 89, no. 4 (2005).

[18] W.H. Frey, "Us Population Disperses to Suburbs, Exurbs, Rural Areas, and "Middle of the Country" Metros," in *THE AVENUE* (Brookings Institution, 2018).

of providers. However, given doctor's of optometry sweeping geographic accessibility (see 2.7) and the ability of comprehensive eye examinations to discover the ocular manifestations of 276 systemic diseases, doctors of optometry are favorably positioned to make initial diagnoses and refer to primary care and specialty providers as necessary.

2.3. *Training*. Doctors of optometry already serve communities as primary eye care providers, and, as highly trained physicians, can – and do, in several states – provide many of the same primary care procedures as their ophthalmology counterparts. There is considerable overlap in the education and medical training for doctors of optometry and ophthalmologists. Optometry school, like medical school, is a four-year graduate-level program often followed by a residency program. While ophthalmologists may devote those years of medical school to general medical knowledge, it's only in their residencies where ophthalmologists learn the specifics about visual systems and eye surgery.[19] Consequently, doctors of optometry, whose training also includes general medical knowledge, benefit from substantially more applied clinical experience compared to that of a typical medical doctor. Consider State University of New York College of Optometry, where optometry students are immersed in the University Eye Center clinic from their first year and direct patient care begins increasing in their second year.[20] Similarly, consider the curriculum at The Ohio State University College of Optometry, where optometry students take classes ranging from Clinical Ocular Pharmacology, Management of Glaucoma, Systemic Disease for Optometry, Surgery and Co-Management of Ocular Disease, and significantly more.[21] While education and training may be similar, the distinction couldn't be more apparent between a profession that provides primary eye care services – i.e., the examination, diagnosis, treatment and management of diseases, injuries and disorders of the visual system, the eye and associated structures, as well as identifying related systemic conditions – and one that specializes in the referred care of these patients requiring eye surgery. In fact, HHS noted that doctors of optometry can provide the same services as other physician groups, and as previously noted HHS further advised, "states should consider changes to their scope of practice statutes to allow all health care providers to practice to the top of their license, utilizing their full skill set."[22] There are currently more than 46,000 doctors of optometry practicing in the U.S., providing primary eye care in more than 10,000 communities; only 12% of counties lack access to an eye care provider.[23]

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[19] UCLA, "Optometrist Vs. Ophthalmologist: What's the Difference?," (David Geffen School of Medicine, University of California, Los Angeles (UCLA), 2016).
[20] SUNY's curriculum, https://www.sunyopt.edu/education/academics/od-program/od-curriculum
[21] Ohio State University's curriculum, https://optometry.osu.edu/curriculum
[22] Alex M. Azar II, "Reforming America's Healthcare System through Choice and Competition," (U.S. Department of Health and Human Services: U.S. Department of Health and Human Services, 2018).
[23] Based on HPI, "Fact Sheet: County Demonstrates Eye Care Access Nationwide," (Washington, D.C.: American Optometric Association: Health Policy Institute, 2018). The HPI report is a correction of D. M. Gibson, "The Geographic Distribution of Eye Care Providers in the United States: Implications for a

2.4. *Quality*. Doctors of optometry provide a high level of quality care that is commensurate to that of ophthalmologists, and U.S.-based outcomes studies consistently reinforce this fact.[24] Moreover, these findings have borne out in several analogous studies conducted outside of the U.S., showing that doctors of optometry provide not only quality primary eye care[25] but also quality advanced eye care.[26] As a testament to this quality of care, not a single state has reversed or amended statutes or regulations to restrict the scope of practice of doctors of optometry following expansion of their scope of practice.

2.5. *Productivity*. Doctors of optometry increase the overall productivity (i.e., output per unit of input) of eye care in a variety of treatment settings.[27] This is demonstrated by the outcomes associated with interdisciplinary, coordinated eye care teams, wherein the doctor of optometry plays a critical role. Early indications of the success of this model were reported by Cohen et al., who found that the integrated program deployed in the Veterans Administration (VA) Medical Center environment resulted in improved patient satisfaction, improved working relationships among ophthalmologists and doctors of optometry, and enhanced staff productivity.[28] These general findings were confirmed more recently by Lynch et al., who also examined productivity in the VA setting.[29] Collaborative programs have also been shown to work well in commercial managed care settings, where some studies have shown that greater reliance on doctors of optometry results in higher overall productivity and efficiency.[30] These findings have been supported

National Strategy to Improve Vision Health," *Prev Med* 73 (2015). The HPI report used more up to date data and accounted for optometrists practicing in multiple locations.

[24] For example, see D. A. Revicki and M. L. Poe, "Quality of Care in Cataract Surgery Cases Experiencing Post-Operative Complications with Co-Managed Care," *J Am Optom Assoc* 66, no. 5 (1995); A. H. Cohen et al., "Integrating Ophthalmological and Optometric Services in a Va Hospital Program," *Public Health Rep* 101, no. 4 (1986); M. Soroka et al., "Optimal Clinical Management of Eye Problems: The Role of Optometrists in Managed Care Plans," *Optometry* 71, no. 12 (2000).

[25] For example, see A. Azuara-Blanco et al., "The Accuracy of Accredited Glaucoma Optometrists in the Diagnosis and Treatment Recommendation for Glaucoma," *Br J Ophthalmol* 91, no. 12 (2007).

[26] For example, see H. Baker et al., "Effectiveness of Uk Optometric Enhanced Eye Care Services: A Realist Review of the Literature," *Ophthalmic Physiol Opt* 36, no. 5 (2016); A. Jindal et al., "Agreement among Optometrists and Ophthalmologists in Estimating Limbal Anterior Chamber Depth Using the Van Herick Method," ibid.35, no. 2 (2015); D. Z. Reinstein et al., "Reproducibility of Manifest Refraction between Surgeons and Optometrists in a Clinical Refractive Surgery Practice," *J Cataract Refract Surg* 40, no. 3 (2014).

[27] J. C. Erie, D. O. Hodge, and M. A. Mahr, "Joint Management of Cataract Surgery by Ophthalmologists and Optometrists," *Ophthalmology* 123, no. 3 (2016).

[28] Cohen et al.

[29] M. G. Lynch et al., "Eye Care Productivity and Access in the Veterans Affairs Health Care System," *Mil Med* 182, no. 1 (2017).

[30] For example, see Soroka et al; M. Soroka et al., "Alternative Arrangements for the Delivery of Eye Care Services within Staff Model Managed Care Organizations," ibid.74, no. 11 (2003).

by comparable study results from non-U.S. studies.[31] Optometry led multi-disciplinary teams can enhance the delivery of care and leverage the expertise of a variety of provider types.

2.6. *Competition*. Doctors of optometry contribute to the overall competitiveness of the U.S. health care landscape, and there is unequivocal evidence that competition (in this case measured as a larger overall number of clinicians providing eye care) results in better outcomes and at lower overall costs. There is now a large body of evidence showing that market-based innovation and competition have resulted in better health outcomes and better organizational efficiency, a concept that originally gained a foothold in the 1990s and 2000s with the publication of several rigorous studies showing evidence of the benefits of competition on costs and quality.[32]

2.7. *Access*. Doctors of optometry deliver 85 percent of the primary eye health care in the U.S., practicing in counties that span 99 percent of the U.S. population.[33] Moreover, nearly a third of all voters nationwide report visiting a doctor of optometry in the past year as opposed to only 22% who visited an ophthalmologist.[34] Taken together, these figures demonstrate that doctors of optometry are wholly accessible in communities, large and small, nationwide. Restrictive state laws based on outdated assumptions of the profession's skillset continue to create barriers arbitrarily imposed by state legislatures to patient care that could be surpassed with scope of practice expansion that realizes the full potential of doctor's of optometry education and training. Given the aforementioned disconnect between rising demand and static supply, doctors of optometry practicing in states with expanded scope of practice can improve overall access to eye care. Research shows that more providers per capita leads to better access to care, and better access to

[31] For example, see A. M. Mongan et al., "Changing Trends in Postoperative Cataract Care: Impact of Electronic Patient Records in Optometrist-Delivered Shared Care," *Ir J Med Sci* 187, no. 2 (2018); M. Shah et al., "Task Sharing: Development of Evidence-Based Co-Management Strategy Model for Screening, Detection, and Management of Diabetic Retinopathy," *Int J Health Plann Manage* 33, no. 4 (2018); W. Wittich, A. Canuto, and O. Overbury, "Overcoming Barriers to Low-Vision Rehabilitation Services: Improving the Continuum of Care," *Can J Ophthalmol* 48, no. 6 (2013).

[32] For example, see L. C. Baker, M. K. Bundorf, and D. P. Kessler, "Competition in Outpatient Procedure Markets," *Med Care* 57, no. 1 (2019); FTC, "Improving Healthcare. A Dose of Competition," *Dev Health Econ Public Policy* 9 (2005); D. R. Haley et al., "The Influence of Hospital Market Competition on Patient Mortality and Total Performance Score," *Health Care Manag (Frederick)* 35, no. 3 (2016); H. J. Jiang, B. Friedman, and S. Jiang, "Hospital Cost and Quality Performance in Relation to Market Forces: An Examination of U.S. Community Hospitals in the "Post-Managed Care Era"," *Int J Health Care Finance Econ* 13, no. 1 (2013); J. Rogowski, A. K. Jain, and J. J. Escarce, "Hospital Competition, Managed Care, and Mortality after Hospitalization for Medical Conditions in California," *Health Serv Res* 42, no. 2 (2007).

[33] www.aoa.org/documents/HPI/HPI%20Uniform%20Edit%20Format%20ACCESS%20TO%20EYE%20CARE.pdf

[34] Southpaw Insights, "Americans' Thoughts and Experiences Around Vision Care", 2019

care leads to better health outcomes.[35] To illustrate this relationship, a literature review by Macinko et al. found that an increase of one primary care physician per 10,000 population was associated with an average mortality reduction of 5.3%, or 49 per 100,000 per year.[36] Several studies show that a larger number of doctors of optometry improves access to primary eye health care. Among adults with diabetes, for example, Chou et al. found that access to dilated eye exams was worse in U.S. counties with fewer eye care professionals (ECPs).[37] In addition, Soroka et al. found that access to eye care in New York State improved significantly as the supply of doctors of optometry increased.[38]

2.8. *Scope of Practice.* The U.S. is a patchwork of optometric scope of practice acts, as disparate from one state to the next as the outmoded, merit-less reasons for unnecessarily limiting optometric services. However, there is historical precedent for expanding scope of practice when the demand of eye care widens beyond the supply of eye care professionals. As the aforementioned access benefits associated with increasing provider supply and an evolving medical-model curriculum in the schools and colleges of optometry became more apparent, states began passing laws allowing optometrists to perform a wider array of services, referred to as scope of practice expansion laws.[39] The four basic interconnected legislative topics have been: (1) the use of diagnostic pharmaceutical agents (DPA); (2) diagnosis of disease; (3) prescription of therapeutic pharmaceutical agents (TPA); and (4) performance of surgical procedures.[40] Of these, granting doctors of optometry DPA privileges was the first momentous step in scope of practice expansion legislation and a long process that took decades to fully realize – beginning with Rhode Island in 1971 and only concluding with Maryland in 1989. Next, doctors of optometry focused their legislative efforts on the ability to diagnose diseases or conditions of the eye, as well as gain authorization to prescribe medications to treat those conditions, a particularly watershed moment considering the profession had long been trained and educated to provide that level of care yet were restricted by their respective scope of practice laws. In fact, it wasn't until 2004 that Vermont became the last remaining state where the legislature authorized optometrists to diagnose diseases and disorders of the eye versus detect. This was done in recognition of the ever-expanding education and training of optometrists into medical eye care. The District of Columbia was the last jurisdiction to grant doctors of optometry the right to prescribe drugs (TPA privileges) for their patients, and even then, this authority is still not uniform across all states. In the

[35] X. Zhang et al., "Measuring Access to Eye Care: A Public Health Perspective," *Ophthalmic Epidemiol* 15, no. 6 (2008).
[36] J. Macinko, B. Starfield, and L. Shi, "Quantifying the Health Benefits of Primary Care Physician Supply in the United States," *Int J Health Serv* 37, no. 1 (2007).
[37] C. F. Chou et al., "Impact of Geographic Density of Eye Care Professionals on Eye Care among Adults with Diabetes," *Ophthalmic Epidemiol* 19, no. 6 (2012).
[38] M. Soroka, "The New York State Optometry Workforce Study," *J Community Health* 37, no. 2 (2012).
[39] S. L. Cooper, "1971 - 2011: Forty Year History of Scope Expansion into Medical Eye Care," *Optometry* 83, no. 2 (2012).
[40] Ibid.

fourth form of scope of practice expansion legislation - performance of surgical procedures - doctors of optometry have focused their legislative efforts on surgical privileges and the use of lasers for therapeutic purposes. While Iowa became the first state to specifically authorize removal of superficial foreign bodies in 1985, over time, variations of the law have been enacted in different states nationwide. Such was the case in 1988 when Oklahoma was one of 4 states where "the law at that time did not have a specific prohibition against the performance of surgery in the Optometry Act."[41] Since then, Kentucky, Alaska, and Louisiana have successfully followed suit.

2.9. In sum, the following scope of practice expansions are noteworthy since 1998: 5 states gained authority to perform laser procedures (including "lumps and bumps"); 4 states gained authority to perform surgical excisions of external lesions including potential malignancies (remove lumps and bumps); 10 states gained authority to perform additional surgical procedures as authorized by the state; 7 states gained authority to treat glaucoma with any topical medication or topical and oral treatment, making glaucoma treatment authorized in 49 states and the District of Columbia; 14 states gained authority to prescribe any oral medications, bringing the total authorized jurisdictions to 47 states plus the District of Columbia; 17 states gained authority to prescribe any oral controlled substance, bringing the total to 44 states authorized; and 18 jurisdictions gained authority to administer injectables (anaphylaxis or anaphylaxis and other), making injectables authorized in 35 states and the District of Columbia.

2.10. *Advanced Procedures.* Currently, four states – Alaska, Louisiana, Kentucky and Oklahoma – permit certain advanced surgical procedures, such as phototherapeutic keratectomy (PTK) laser eye surgery, YAG laser capsulotomy and trabeculoplasty, under their scope of practice acts.[42] Additionally, Arkansas recently passed a scope of practice expansion that will add to this list of states with some advanced surgical procedures. This is not only consequential for patients, as doctors of optometry gain authority to deliver the full range of primary eye health care services, but also for ophthalmologists who will be allotted more time to focus on their surgical specialty, released from the time constraint of non-invasive or minimally invasive procedures that can be – and are, in the aforementioned states – now routinely performed by doctors of optometry. Evidence shows that access to eye health and vision care is an essential priority among voters nationwide (96%), second only to access to primary health care services (97%). Similarly, it is important to note that convenience is a key determinant for 80% of American voters when it comes to their eye health, reporting they'd rather have easy access to a doctor of optometry than have to travel further or wait longer to schedule with a specialist. As scope of practice authority expands for doctors of optometry, patients can safely receive certain advanced procedures and services previously only authorized by ophthalmologists. Significantly, in the four states

[41] Ibid.

[42] K. Chodnicki et al., "A Systematic Evaluation of State Laws Governing Optometric Glaucoma Management in the United States Upto 2015," *J Glaucoma* 27, no. 3 (2018).

where these advanced surgical procedures have been enacted, stretching as far back as 1998 in the case of Oklahoma, there have been no malpractice judgements against doctors of optometry related to these procedures. In fact, there are hardly any incidents reported at all. Doctors of optometry have demonstrated they safely, efficiently perform advanced procedures in an effective primary eye care model that plays to either discipline's – optometry and ophthalmology – strengths. More than 22 million Americans, aged 40 and older, are affected by cataracts, making cataract surgery one of the most common procedures in the U.S.[43] In 2015, only about 9,000 ophthalmic surgeons performed 3.6 million cataract surgeries, or about 400 cataract surgeries per year, per ophthalmologist.[44] Optometry has the education, training and workforce supply to handle the demand for these primary eye care services in a model that permits ophthalmology more capacity for necessary surgeries. Further, Americans overwhelmingly support this model: 91% of voters' nationwide support laws that allow doctors of optometry to provide the full range of care commensurate to their education and training (discussed further in Section 4.2).

2.11. *Transaction Costs.* Doctors of optometry reduce the overall transaction costs associated with obtaining eye health care services, especially among states with advanced procedures permitted under expanded scope of practice, in addition to improving overall access. Transaction costs associated with medical care consist mainly of time; according to the American Time Use Survey, individuals in the U.S. spend an average of 2.06 hours each time they obtain medical care.[45] The average U.S. hourly wage, as of April 2019, is $27.77. Thus, the average medical care transaction cost (in terms of time only), is $57.21.[46] This concept has been applied to eye care "transactions" in several studies. For example, Ihrig et al. assessed travel cost savings associated with telerehabilitation for low-vision care in the VA community.[47] This study was focused on assessing travel mileage and travel time, and did not assess the quality of the care provided via telehealth services. When focusing on time and travel cost, the researchers found that adding low-vision telerehabilitation services (i.e., reduction in travel time) resulted in a 24% increase in utilization of low-vision patient care combined with a reduction in median travel time of 2.09 per case, resulting in a transaction cost savings of $65 per case. Transaction costs also rise with waiting times, and long wait times have been identified as barriers to obtaining necessary

[43]https://www.beckersasc.com/news-analysis/10-statistics-and-facts-about-ophthalmology-and-ophthalmologists.html
[44] "The Future of Cataract Surgery," *Ophthalmology Times*2017.
[45] Time spent obtaining medical care plus any necessary travel. Based on American Time Use Survey, Table A-1. Time spent in detailed primary activities and percent of the civilian population engaging in each activity, averages per day by sex, 2017 annual averages
[46] Based on the Bureau of Labor Statistics, Table B-3. Average hourly and weekly earnings of all employees on private nonfarm payrolls by industry sector, seasonally adjusted
[47] C. Ihrig, "Travel Cost Savings and Practicality for Low-Vision Telerehabilitation," *Telemed J E Health* (2018).

follow-up care for diabetic retinopathy.[48] It is also worth noting that driving time is in many cases more arduous for individuals with visual impairment, thereby further increasing the overall transaction costs associated with obtaining eye care.[49] Again, transaction costs are increasingly important given the current trends in U.S. population dynamics; that is, the aging population, overall population growth in exurbs, and the declining numbers of medical providers in urban and rural areas. Unlike their medical counterparts, optometrists are currently practicing in 82% of counties (or county equivalents) where a majority of the population is rural[50], providing access to primary eye health care services. Moreover, this increased access to primary eye health care services afforded by doctors of optometry further reduces redundant visits for follow up care. Among states with the most advanced scope of practice, drawing on as much as two decades of advanced eye care procedures and services in the case of Oklahoma (discussed in 2.10), the percentage of residents seeing both a doctor of optometry and ophthalmologist for care is lower than the national average. While 7% of voters' nationwide report personally visiting both a doctor of optometry and ophthalmologist in the past year, only 4%, 4% and 5% report the same among Oklahoma, Louisiana and Kentucky, respectively. The decreased duplication of care further reduces these transaction costs on behalf of the patient and health care costs from multiple providers.

[48] A. J. Lu et al., "Analysis of Patient-Reported Barriers to Diabetic Retinopathy Follow-Up," *Ophthalmic Surg Lasers Imaging Retina* 50, no. 2 (2019).
[49] J. M. Wood and A. A. Black, "Ocular Disease and Driving," *Clin Exp Optom* 99, no. 5 (2016).
[50] www.aoa.org/documents/HPI/HPI%20Uniform%20Edit%20Format%20ACCESS%20TO%20EYE%20CARE.pdf

3. COST-BENEFIT

3.1. *Overview*. In this section, we conduct a simple cost-benefit analysis in the form of a simulation model to estimate the overall economic value of doctors of optometry. This descriptive analysis ties together some of the concepts from Section 2.0 above to form a picture of the overall value doctors of optometry contribute to the U.S. health care system.[51] The cost-benefit calculation is based on two sources of value: (1) the health benefits associated with access to care; and (2) the transaction cost reductions (see Section 2.11 above) associated with ease of access to services (i.e., approximated by the density of providers). There are, of course, other sources of value, such as economic impact by way of a normal health care expenditure multiplier, but in this case, for simplicity we assume that those effects are the same across all providers of care.

3.2. The analysis hypothesized that by expanding the array of services that doctors of optometry can provide (i.e., through scope of practice expansion laws) increased access to care will generate overall health care savings by way of better health outcomes and lower transaction costs. The analysis assumes a cohort of all U.S. patients seeking eye care in a given year. The main diseases and conditions assumed to be most impacted by doctors of optometry, as denoted by disease prevalence are age-related macular degeneration, age 50 and older (AMD; n=2,069,403); cataract (n=24,409,978); diabetic retinopathy (n=7,685,237), and glaucoma (n=2,719,379).[52] Together, these conditions affect 36,883,997 individuals in the U.S.

3.3. First, the cost-benefit model described the total number of patient visits (to either a doctor of optometry or an ophthalmologist) associated with the aforementioned conditions. Based on prevalence – and given the nature of these conditions and diseases that require repeat visits with an eye care provider – our model conservatively projected a total of 100 million patient visits per year to any eye care provider for the four conditions.[53] Then, based on a very conservative estimate of scope of practice expansion, we increased this amount by only 10%. Our rationale behind this diminutive figure is because, statistically, it is

[51] This analysis approaches "savings" only from the perspective of estimated savings to the U.S. health system. There are other benefits, such as "multiplier" benefits to the national and state economies, but these are not considered here. Thus, our estimates could be considered conservative; the actual value to the U.S. economy (of scope of practice expansion) could actually be considerably larger than what we report here.

[52] These are the main "age-related" diseases affecting those over the age of 40, as listed by disease prevalence. There are of course many other important diseases and conditions impacted by optometrists, but the data for the age-related conditions (and more generally for the aged cohort) is generally more complete. Refer to NEI, "Prevalence of Adult Vision Impairment and Age-Related Eye Diseases in America," (Washington, D.C.: National Institutes of Health, National Eye Institute, 2016).

[53] There is some debate in the literature on the actual range of this number. We use the estimates developed by Wilson et al. because it appears to be a generally conservative estimate, based on multiple sources. Refer to F. A. Wilson, J. P. Stimpson, and Y. Wang, "Inconsistencies Exist in National Estimates of Eye Care Services Utilization in the United States," *J Ophthalmol* 2015 (2015). Summing data from other reports and published studies arrives at a similar number.

difficult to develop sufficiently long time periods to capture temporal effects and sufficiently heterogenous variation across states to capture cross-section effects.[54] Thus, we define the status quo as 100 million patient visits per year for these four conditions, and scope of practice expansion conservatively elevates this to 110 million visits in our model.

3.4. *Transaction Cost Effects*. Based on the discussion in Section 2.11 above, we estimate the expected transaction costs associated with an eye care visit to be $50, which is lower than the amount derived above and substantially lower than the amount found by Ihrig et al. This translates to total eye care transaction costs of $5.0 billion (for the status quo). It is then assumed that the 10% increase in access to care lowers these transaction costs by 20% (to $40), which is a conservative figure based on Lee et al., who found that travel distances to ophthalmologists may be as much as 50% longer than travel distances to doctors of optometry.[55] At the higher service volume, this results in total transaction costs of $4.4 billion, and a difference (i.e., estimated savings) of $600 million per year, or $16.27 per eye care patient visit per year.

3.5. *Outcomes Effects*. To assess the savings impact of scope of practice expansion on access to eye health care, we first derived an estimate of the total annual costs of the four diseases and conditions. Based on direct medical care expenditures and other direct costs (and excluding work productivity losses), we found these costs to be $27.3 billion per year.[56] Again, our analysis' hypothesis is that this amount can be reduced by improving access and thereby improving care (e.g., earlier diagnosis, timely treatment). There is a wide variety of literature identifying the health outcomes effects of what would generally be considered optimal treatment, but it is difficult to properly meta-analyze these sources due to the diversity of outcomes measured. However, we were able to settle upon the impact at about $4 billion per year (i.e., assuming all patients were treated "more optimally" compared to the status quo).[57] This represents a savings of 14.65% and about $108.45 per eye care patient per year.

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[54] Both of these tasks were attempted for this analysis, with a large array of statistical models tested; models did not yield stable results. However, using number of providers as a post-scope of practice expansion metric, Chodnicki et al. found that states with scope of practice expansion had approximately 23% more providers, hence the 10% estimate seems both reasonable and conservative. Refer to Chodnicki et al.

[55] C. S. Lee et al., "Evaluating Access to Eye Care in the Contiguous United States by Calculated Driving Time in the United States Medicare Population," *Ophthalmology* 123, no. 12 (2016).

[56] Based on two studies: ibid.; D. B. Rein et al., "The Economic Burden of Major Adult Visual Disorders in the United States," *Arch Ophthalmol* 124, no. 12 (2006); M. Salm, D. Belsky, and F. A. Sloan, "Trends in Cost of Major Eye Diseases to Medicare, 1991 to 2000," *Am J Ophthalmol* 142, no. 6 (2006).

[57] See generally J. C. Javitt, "Cost Savings Associated with Detection and Treatment of Diabetic Eye Disease," *Pharmacoeconomics* 8 Suppl 1 (1995); Macinko, Starfield, and Shi; D. B. Rein, "Vision Problems Are a Leading Source of Modifiable Health Expenditures," *Invest Ophthalmol Vis Sci* 54, no. 14 (2013); Soroka et al.

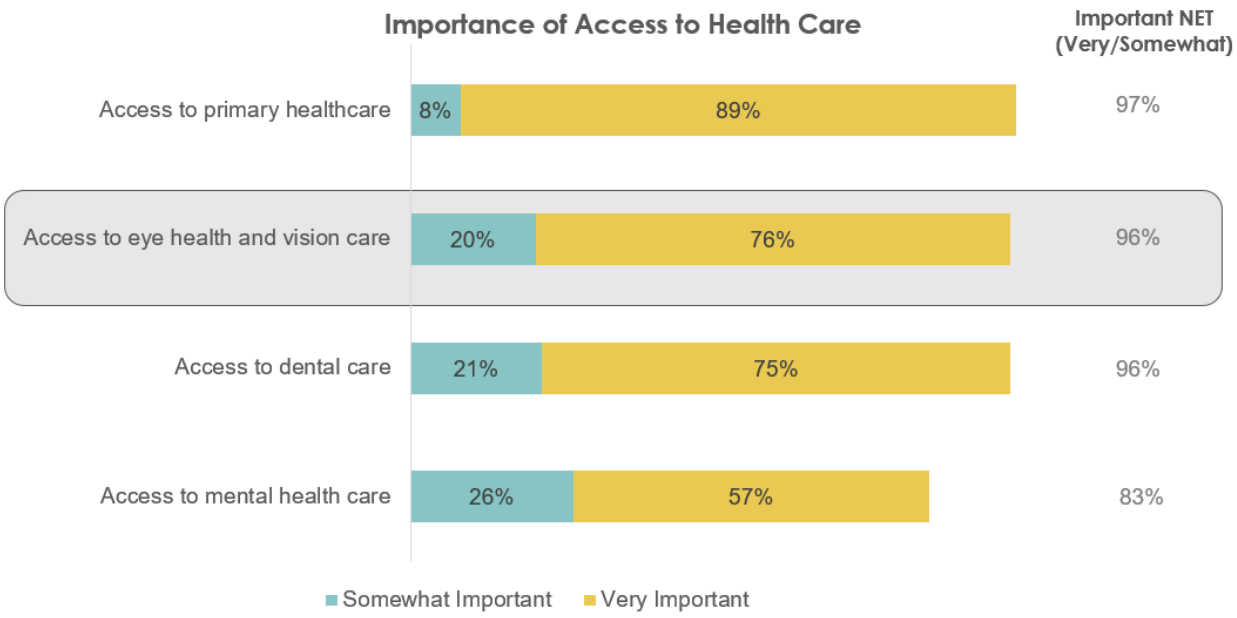
3.6. *Total Effects*. Taken together, transaction cost effects and health outcomes effects result in total estimated savings of $4.6 billion per year. This is, of course, a conservative number, but each of the parameters used in its calculation are reasonable at face value based on the existing literature. In terms of sensitivity analysis, ± 10% changes in the estimates of key parameters (i.e., scope of practice expansion effects of 10%; transaction savings of 20%, and savings from better outcomes of 14.65%) results in only minor differences, with resulting additional cost savings in the range of about $3.5 billion to $5.5 billion annually.

4. PUBLIC PERCEPTIONS

4.1. To bring into focus some of the important concepts discussed in the preceding sections of this report, Southpaw Insights ("SI") was commissioned to conduct a survey on American voters' thoughts and experiences pertaining to eye health and vision care. They fielded five questions in national and state-specific omnibus surveys (targeting Oklahoma, Kentucky, Louisiana and Alaska) using the field services of ORC International to measure Americans' views on and support of advancing optometric scope of practice. The ORC CARAVAN Omnibus is a national online research study conducted among 1,000 consumers and fielded from Friday, May 24, 2019 through Tuesday, May 26th. Respondents were excluded from this study if they worked in health care, media, advertising or marketing fields, or if they were not registered voters. Using this audience criteria, the total number of respondents was 757 adults (age 18+) nationwide. Simultaneously, SI fielded the same five questions in the CARVAN Geo Omnibus using the same audience targets in Oklahoma, Kentucky, Louisiana, and Alaska (N=125 in each state). The survey was fielded from Thursday, May 23, 2019 through Thursday, May 30, 2019.

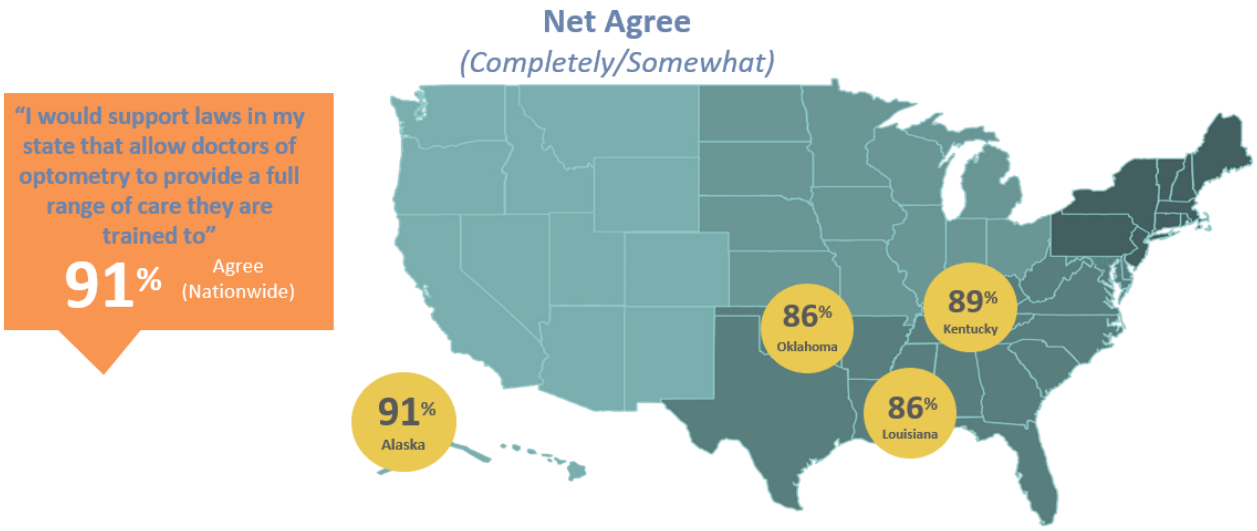
4.2. Remarkably, nearly every voter nationwide considers having access to eye health and vision care, for themselves and their family, a priority; three quarters of voters consider access to eye health and vision care *very* important (76%) while 96% say it is either very or somewhat important (Figure 4-1). This sentiment was shared across the four states where scope of practice has already expanded to include advanced surgical procedures – Alaska, Oklahoma, Louisiana, and Kentucky.

Figure 4-1. Importance of Access to Health Care



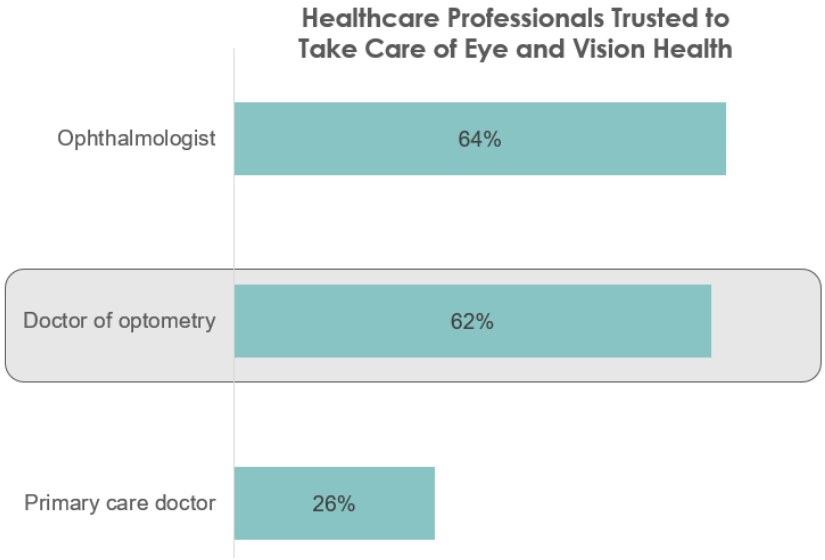
4.3. Nine out of ten voters nationwide support laws that allow doctors of optometry to provide a full range of care. This sentiment is shared among voters residing in Alaska, Oklahoma, Louisiana, and Kentucky. (Figure 4-2).

Figure 4-2. Support Laws that Allow Doctors of Optometry to Provide Full Range of Care



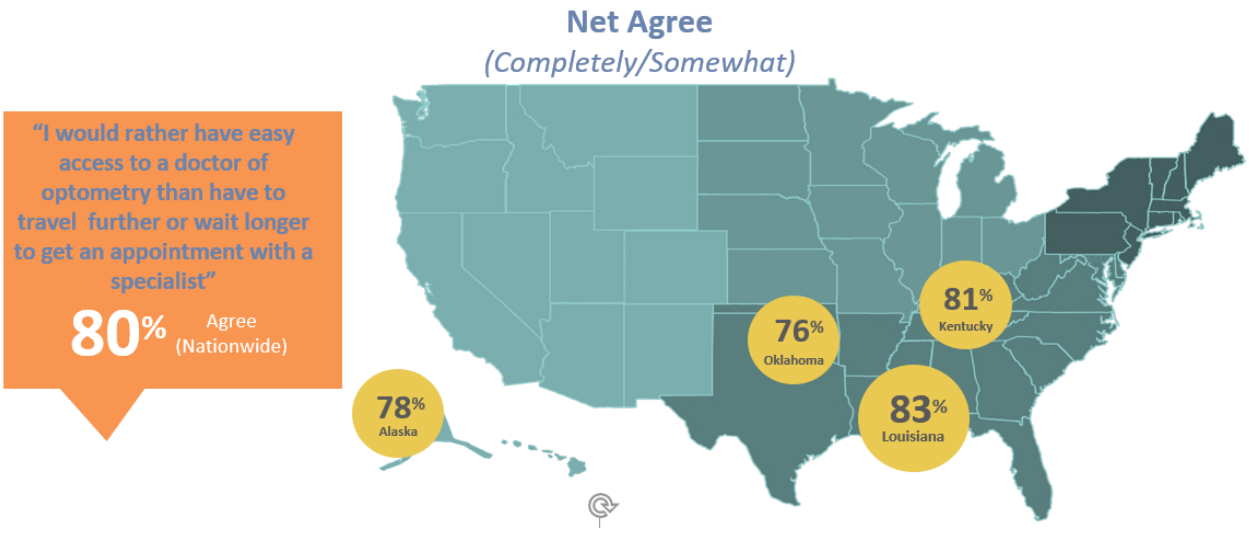
4.4. Trust in doctors of optometry is high with nearly two thirds of voters saying they trust a doctor of optometry to take care of their eye and vision health as compared to only a quarter of voters who trust their primary care doctor with their eye health (Figure 4-3). This high level of trust in doctors of optometry is shared across the four priority states. Nearly all voters nationwide (91%) support laws that allow doctors of optometry to provide a full range of care.

Figure 4-3. Trust in Health Care Professionals



4.5. Finally, convenience is key for 80% of American voters when it comes to their eye health (Figure 4-4). Eight in ten voters nationwide say they would rather have easy access to a doctor of optometry than have to travel further or wait longer to get an appointment with a specialist. Nearly eight in ten voters nationwide agree that having competition in health care is a good way to lower costs. Three quarters of voters residing in Alaska, Oklahoma, and Kentucky and nearly nine in ten in Louisiana view competition in the health industry positively.

Figure 4-4. Convenience for Eye Health



CONCLUSION

Information presented in this report clearly outlines the case for expanded scope of practice for doctors of optometry, allowing them to diagnose, treat and practice to the highest levels of their knowledge, education and training. The overwhelming support and trust among U.S. voters for doctors of optometry to practice at the highest levels of their training (91%), coupled with voters' sense of importance placed on access to qualified providers like doctors of optometry (96%), accentuates the disparity between practical application and antiquated opposition to legislative efforts which enhance scope of practice. This unequivocal support by American voters, when coupled with the conservative health care savings estimate of over $4.6 billion annually, proves undeniably that expanded scope of practice legislation for doctors of optometry, to the highest levels taught and trained, is necessary to meet the increasing demands on the U.S. health care system.

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1971 – 2011: Forty Year History of Scope Expansion Into Medical Eye Care

Sherry L. Cooper

Abstract

The focus of this paper is to provide a historical timeline for many of the well over 180 incremental scope of practice expansion and amplification legislative successes achieved in the United States (U.S.) during the 40-year period 1971 – 2011 that cumulatively expanded optometry into medical eye care. This paper also serves to update the historical timeline of scope of practice amplification legislation enacted after the year 1999, which was so comprehensively described up to that point by Dr. Melvin D. Wolfberg.[1]

Introduction

More than 110 years ago, on April 13, 1901, Minnesota Senate Bill 188 was signed into law establishing the first optometry practice Act. That first scope of practice was defined as:

> "*An act to regulate the practice of optometry.*
>
> Be it enacted by the Legislature of the State of Minnesota:
>
> SECTION 1. *The practice of optometry is defined as follows, namely: The employment of subjective and objective mechanical means to determine the accommodative and refractive states of the eye and the scope of its functions in general.*"[2]

Over the next 23 years a law to license optometrists and define the scope of services optometrists could legally provide was enacted in every state and the District of Columbia, with the last practice Act enacted on May 28, 1924 in the District of Columbia. In fact, four optometry practice Acts were approved while the jurisdiction was still a territory. These territorial enactments included: New Mexico, enacted March 16, 1905; Arizona, enacted March 14, 1907; Hawaii, enacted April 30, 1917; and Alaska, enacted May 2, 1917.

Beginning with the passage of a law in Rhode Island in 1971 authorizing the use of diagnostic drugs, to the enactment of a law in Kentucky in 2011 authorizing the use of surgery and therapeutic lasers, the scope of the practice of optometry has been expanded into medical eye care *well over 180* times legislatively during the last 40 years in the various U.S. jurisdictions. This historic chapter in the evolution of optometry saw a sweeping transformation of the profession from the expert, but "drugless" refractionists of the early 1900s, to detecting and referring eye disease at mid-century, to today's largest eye and vision care profession,[3,4] providing

patients access to safe and effective vision and medical eye care from their local doctor of optometry.

Due to political compromise some of the scope of practice expansion or amplification laws into medical eye care contained a sunset provision that, if not extended or repealed, had the potential to undo a legislative victory.[5] None of the sunset provisions that were enacted survived to accomplish the obvious goal of the opposition; to revert to an earlier statutorily defined scope of practice. So it is important to note that, in addition to the well over 180 enactments, *no* optometric scope of practice expansion or amplification law has ever been diminished or repealed at a later date by a state legislature.

The legislative steps to expand the authorized scope of practice over the course of this dynamic 40-year period in the evolution of the profession, while sometimes breathtaking in their achievements, were more often small and incremental, as curriculum and legislative successes each grew over time. Optometrists in every state and the District of Columbia educated legislators regarding the training of modern optometrists as they worked to pass laws expanding the scope of practice commensurate with the expanded curriculum, and in order to better meet the medical eye care needs of their patients.

Components of Scope of Practice Expansion

There have been four basic interconnected legislative components related to scope of practice expansion into medical eye care over the past 40 years. Each of these essential elements of expansion was achieved by the various states at their own pace. In fact, there are many areas where further amplification efforts remain to be enacted in order for the states to achieve more uniformity from one to the other regarding prescriptive authority and the ability to perform non-surgical and surgical primary care procedures.

The Four Components:
1 — Use of "Diagnostic Pharmaceutical Agents" or "DPAs." This terminology, and the resultant acronym, was

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coined by the profession to easily explain to lay non-medical legislators legislation seeking to authorize the use of diagnostic drugs within the practice to facilitate the examination. The ability to use anesthetic, dilation, and other topical drugs in the office was a significant first step in the transformation of optometry into the profession it is today.

2 — "Diagnosis" of Disease. Over time, the early optometry practice Acts generally had been amended to authorize optometrists to "*detect*," "*recognize*," or "*ascertain*" diseases or conditions of the eye with a requirement that the optometrist then refer the patient to a medical physician for confirmation of diagnosis and commencement of treatment. This form of legislation sought to specifically establish the legal responsibility of optometrists to "*diagnose*" diseases or conditions of the eye and vision system. This effort was tied to diagnostic, or more frequently, therapeutic prescriptive authority expansion efforts.

3 — Prescription of "Therapeutic Pharmaceutical Agents" or "TPAs." As with DPAs, the "TPA" terminology and acronym were also coined by the profession to easily explain to lay legislators legislation seeking to authorize the prescription of medication to treat many of the diseases or conditions of the eye and related structures that optometrists were educated and trained to diagnose.

4 — Performance of Surgical Procedures. At the beginning of this 40-year period of expansion it is believed that every state's optometry Act except for the laws in Idaho, Indiana, Oklahoma, and Washington state included language prohibiting, in some manner, the performance of surgery. However, certain procedures routinely performed by optometrists, and not normally considered surgery as that term is traditionally understood, have surgical reimbursement codes assigned to them. Primarily for reimbursement reasons, legislation was enacted in the majority of states to make it clear that certain surgical procedures, such as the removal of foreign bodies, are included in the practice of optometry. Until such time as a state legislature repeals a prohibition against performing surgery, defining certain surgical procedures as within the scope of optometric practice and hence not included in any prohibition against performing surgery, was, and continues to be, the approach in most states.

Historical Timeline – Diagnostic Pharmaceutical Agents (DPAs)

While the first law specifically authorizing the use of diagnostic drugs to facilitate the examination was enacted in Rhode Island in 1971, in fact there were two other states prior to 1971 where use of diagnostic drugs by optometrists received favorable attorney general opinions based on an interpretation of the optometry Act in effect at the time.

In Indiana there was a favorable attorney general opinion dated July 17, 1946, affirming that the optometry Act, as reenacted in 1935, authorized the use of legend drugs by optometrists. "Prior to 1935, optometric drug use in patient care was prohibited by law, but the 1935 Indiana Legislature saw fit to remove that restriction and allow optometrists to practice to the fullest extent of their education and clinical experience."[6] Legislation was later considered and defeated by the Indiana legislature that would have prohibited pharmaceutical use – lending weight to the view of the attorney general that diagnostic and prescriptive authority were authorized under the Indiana optometry law. In addition, in 1980, organized ophthalmology challenged that interpretation of the Indiana optometry law in court. The suit was eventually dismissed by the state Court of Appeals in 1985.[7]

In New Jersey there was a favorable attorney general directive issued to the New Jersey State Board of Medical Examiners dated May 22, 1968, that said the optometry Act in effect at that time authorized optometrists to use a local anesthetic to perform corneal tonometric examinations.

Both states went on to enact clarification legislation at a later date making it unambiguous that the use (Indiana and New Jersey) or the prescription (Indiana) of drugs was included in the practice of optometry.

It took almost 18 years from the Rhode Island victory on July 16, 1971 until January 13, 1989 when Maryland became the last state authorizing the use of diagnostic drugs to facilitate the examination. However, considering the fact that varying opposing interests both internal and external to the profession, along with innumerable political and legislative hurdles had to be overcome in 51 separate jurisdictions in order to enact similar legislation, 18 years was a relatively short period of time in the 110-year history of optometry as a legislated profession. (On December 28, 1982 and August 15, 1999, respectively, the U.S. territory of Guam and the Commonwealth of Puerto Rico also enacted diagnostic authority legislation.)

Historical Timeline – Diagnosis of Disease

It is apparently lost to history which state law first established the legal duty for optometrists to "*diagnose*" diseases or conditions of the eye and vision system vs. "*detect*," "*ascertain*," or "*recognize*." Such authority was most likely in place in some states before the first diagnostic or therapeutic laws were enacted. However, we do know the year the *last* practice Act was amended establishing the legal requirement for optometrists in every state and the District of Columbia to diagnose disease.

The last state to amend "ascertain" or "detect" to "diagnose." On May 11, 2004 Vermont Senate Bill 54 was enacted, amplifying previous law that had authorized the prescription of limited topical drugs, excluding those used to treat glaucoma. The 2004 amplification law – one in a series of amplification victories in Vermont over a period of several years – authorized the use and prescription of all topical and oral drugs, including injectables for anaphylaxis. In addition, this Act added authority to treat glaucoma and added specific language affirming the authority of Vermont optometrists to treat the lacrimal gland and use punctal plugs.

Of historical import, the 2004 Act amended the law replacing the language "*ascertain*" and "*detecting the possible presence of*" with "*diagnosing*." This concluded a decades-long effort to clarify, if not elevate, the legal duty of optometrists in every state to *diagnose* diseases and conditions of the eye and related structures, a responsibility entirely appropriate for doctoral level, independent, learned health care providers.

Historical Timeline – Therapeutic Pharmaceutical Agents (TPAs)

On March 4, 1976, West Virginia was the first state to enact legislation specifically granting optometrists the right to prescribe legend (prescription) drugs for their patients and the District of Columbia was the last jurisdiction to do so on April 22, 1998 – a

period of 22 years. (On April 22, 1995, the U.S. territory of Guam also enacted therapeutic prescriptive authority legislation.)

Only five states enacted legislation authorizing diagnostic (DPA) and at least some therapeutic (TPA) drugs in the same law [See Table 1].

Full therapeutic (TPA) authority was not gained, except in very few jurisdictions, all in one legislative victory. **Only four states enacted laws granting full TPA authority in one bill.** [See Table 2].

Prescriptive authority achieved in the initial therapeutic legislative victories was not in any way uniform from state to state. Table 3 illustrates many of the incremental steps of scope of practice/prescriptive authority expansion required in the vast majority of the states. Because of the great number of legislative successes, even this Table does not provide the luxury of space that would be required to illustrate every single incremental victory expanding optometry into medical eye care.

For example:

- Six states did not achieve topical steroid authority with their initial therapeutic law [See Table 4];
- Twenty six states gained topical drug prescriptive authority only with their initial therapeutic law and had to go back to the legislature at a later date to gain oral drug authority (*in fact, at this time 3 jurisdictions remain without any oral drug authority*);
- Twenty-six states and the District of Columbia gained glaucoma treatment with their initial therapeutic law (albeit many with topical drugs only) while the rest had to go back later to gain authority to treat glaucoma (*in fact, at this time 1 state remains without the authority to treat glaucoma*);
- Only 10 states gained controlled narcotic substance authority with their initial therapeutic law (*in fact, at this time 7 states and the District of Columbia remain without any controlled narcotic substance authority*);
- Only 9 states and the District of Columbia gained authority with their initial therapeutic law to use injectable agents to treat an anaphylactic reaction or to diagnose or treat disease *(in fact, at this time 15 states remain without injectables authority of any type*);
- Some states were initially required to use or prescribe drugs from a formulary – most did not;
- Many states gained certain drugs or classes of drugs and had to go back later for additional drugs or classes of drugs – or repeal the limitations altogether; and
- Some states initially had to accept multiple statutorily-defined standard of care or other conditions, restrictions, or limitations on the use or prescription of drugs to treat diseases or conditions of the eye [See Figure 1].

The fact is that many of the states and the District of Columbia must still pursue additional amplification legislation in order to fully establish a prescriptive authority law that meets the criteria for uniformity described below.

For political and practical reasons, principally because the various state laws are written style-wise so differently from each other, there is no recommended uniform prescriptive authority language. However, there is a uniform prescriptive authority end point result.

A uniform prescriptive authority law is a tangible concept. While there is no ***model*** language there is a ***model result***; it is the ***effect*** of a state's practice Act, not the precise language of the law. The statutory language establishing uniform prescriptive authority can be written in as many ways as there are practice Acts. The goal is for the optometry law to authorize the use and prescription of all appropriate or necessary legend (prescription) and over-the-counter drugs, including controlled narcotic substances, via any route of administration for the diagnosis, treatment, and management of conditions of the vision system, eye, and related structures. As with other classes of independent doctoral-level prescribing professions (e.g., allopathic or osteopathic medical physicians, dentists, and podiatrists) an optometry license issued or renewed today should automatically include full prescriptive authority. And importantly, there should be no statutorily defined conditions, restrictions, limitations, or other standard of care-type language codified into the practice Act by the state legislature.

While the legislature is the only body in each state empowered to set the general parameters of scope of practice for the various regulated professions, the legislature, whose vast majority of members are not educated and trained as health care providers, shouldn't be practicing the mechanics of health care by defining in statute how specific services or procedures are to be provided, under what circumstances patients should be referred, or which medications are appropriate for a certain condition. These medical decisions, made for an individual patient, should be left to the independent professional judgment of all doctoral-level health care providers, each of whom is held to a standard of care and expected to practice appropriately without such statutorily spelled out mandates.

A uniform scope of practice law is a tangible concept. Quite simply, an optometry license, as authorized by the state legislature, should allow licensees to examine, diagnose, treat, and manage diseases or conditions of the vision system, eye, and related structures with any appropriate means. This includes every facet of the practice of modern optometry, from the use of lenses and prisms; to the provision or prescription of ocular exercises, vision therapy, and vision rehabilitation; to the prescription, fitting, dispensing, and sale of corrective eyewear and contact lenses, including plano or cosmetic lenses; to the ordering or performing of appropriate diagnostic or imaging tests; to the use or prescription of appropriate drugs, including controlled narcotic substances; to the performance of non-surgical and surgical procedures.

While the concept has gone through philosophical and statutory changes over the decades, the more than 180 expansion and amplification laws enacted over the past 40 years in the various states and the District of Columbia have strived to achieve, albeit often in incremental steps, a uniform medical eye care scope of practice among the jurisdictions.

Historical Timeline – Performance of Surgical Procedures

The performance of certain procedures that are assigned Current Procedural Terminology (CPT®)[8] surgical reimbursement codes began on March 4, 1976 with passage of West Virginia House Bill 1005, the first therapeutic law. The legislature established the scope of practice of optometry in 1976 in West Virginia as:

"§30-8-2. Practice of optometry defined.
Any one or any combination of the following practices shall constitute the practice of optometry:
(c) The employment ***without the use of surgery*** *of any instrument, device, method or diagnostic or therapeutic drug for topical application to the anterior segment of the human eye intended for the purpose of investigating, examining,* ***treating****, diagnosing, improving* ***or correcting any*** *visual defect or* ***abnormal condition of the human eye or its appendages****;"* [emphasis added]

Nowhere in the 1976 West Virginia law was surgery defined. And since removal of superficial foreign bodies and treatment of the lacrimal drainage system do not involve cutting, suturing, or use of a local or general anesthetic (all components of surgery as that term *might* commonly be defined), performing these procedures was not prohibited.

The law enacted 1 year later on June 3, 1977 in North Carolina authorized the use of diagnostic and therapeutic drugs in the same legislation. There were no restrictions or limitations placed by the legislature on which drugs or routes of administration were authorized. While the law enacted in 1977 included the use of injectable agents, it took a lengthy regulatory process before the North Carolina State Board of Examiners in Optometry authorized their use by optometrists to perform certain procedures or diagnostic tests. The legislature established the scope of practice of optometry in North Carolina in 1977 as:

"§90 – 114. Optometry defined. Any one or any combination of the following practices shall constitute the practice of optometry: (2) the employment of instruments, devices, pharmaceutical agents and procedures, ***other than surgery****, intended for the purposes of investigating, examining, treating, diagnosing or correcting visual defects or abnormal conditions of the human eye or its adnexa; or"* [emphasis added]

The removal of foreign bodies, use of punctal plugs, and other services/procedures not commonly defined to be "surgery" as that term is generally understood were not prohibited.

First state to specifically authorize removal of superficial foreign bodies. Iowa (the sixth state to enact a therapeutic law) enacted Senate Bill 438 on May 31, 1985, becoming the first state optometry law to specifically reference the authority of an optometrist to remove foreign bodies:

"Section 154.1 (new section):
Therapeutically certified optometrists may employ the following pharmaceuticals: topical antimicrobial agents, topical and oral antihistamines, topical anti-inflammatory agents, topical analgesic agents and topical anesthetic agents. ***Superficial foreign bodies may be removed from the human eye and adnexa****. . . ."* [emphasis added]

As therapeutic laws were enacted and/or amplified in other states, a specific reference to the removal of foreign bodies (generally limited to "superficial" foreign bodies) was included in almost every practice Act, which served to prevent inaccurate interpretations of the law by third-party payers when optometrists sought reimbursement for performing the procedure.

Other surgical procedures. Over time, in some states additional surgical procedures such as treatment of the lacrimal drainage system, chalazion, or concretions have been 1) added to the definition of the practice of optometry, 2) exempted from a prohibition against the performance of surgery, or 3) deemed authorized because they were not specifically excluded. The authority to use an injectable drug of some type may be necessary to perform some of these procedures.

The use of lasers for therapeutic purposes. [See Table 5]

Oklahoma Laser Authority. Oklahoma optometrists have been performing laser and non-laser surgical procedures since as early as 1988. In 1988 Oklahoma was one of only 4 states where the law at that time did not have a specific prohibition against the performance of surgery in the optometry Act.

Minutes from the February 21, 1988 meeting of the Oklahoma Board of Examiners in Optometry reflected a recognition by the board that "*when medically necessary, a qualified optometrist may utilize lasers, remove said stitches, and foreign bodies*." In 1989 the optometry board approved a certification process licensees were required to complete in order to become authorized to use lasers for therapeutic purposes.

In 1993 the Oklahoma State Medical Association (OSMA) found a sponsor for legislation seeking to prohibit optometrists from using lasers. The legislation (Senate Bill 883) did not apply to podiatrists, veterinarians, osteopathic physicians, or dentists. The sponsor pulled the bill prior to consideration. That same year, the OSMA sought an attorney general opinion that the use of lasers by optometrists was not authorized. Attorney General Susan B. Loving declined to issue an opinion.

In response to efforts by the OSMA causing Medicare and Medicaid to discontinue paying optometrists for these services, the optometry board issued a formal declaratory ruling in 1994 stating that lasers were within the scope of practice of optometry. Both Medicare and Medicaid resumed reimbursing optometrists.

1994 saw the enactment of a scope of practice expansion bill in Oklahoma when Senate Bill 818 was signed into law by Governor David Walter on April 13, 1994. This legislation repealed the limitation on prescriptive authority to topical agents only, but the law continued to remain silent on surgery (i.e., there was no prohibition against performing surgery) [deletions indicated by ~~strikethrough~~, additions indicated by <u>underscore</u>]:

"Section 581. The practice of optometry is defined to be the science and art of examining the human eye and measurement of the powers of vision by the employment of any means, including the use or furnishing of any self-testing device, the use of any computerized or automatic refracting device, the use of ~~ocular~~ pharmaceutical agents ~~topically applied~~, the diagnosis of conditions of the human eye and the correcting and relief of ocular abnormalities by means including but not limited to prescribing and adaptation of lenses, contact lenses, spectacles, eyeglasses, prisms and the employment of visual training or orthoptics for the aid thereof. <u>*The practice of optometry shall also include the prescribing of dangerous drugs and controlled dangerous substances for all schedules specified in the Uniform Controlled Dangerous Substances Act except*</u>

Schedules I and II for the purpose of diagnosis and treatment of ocular abnormalities. Provided, however, the practice of optometry shall not include the dispensing of drugs. This shall not preclude the dispensing of professional samples to patients."

Also in 1994, the OSMA found a sponsor for legislation to define lasers as surgery and prohibit their use by optometrists. However, Senate Bill 103 failed in Senate Committee.

The next year, the Oklahoma Board of Medical Licensure and Supervision sued the Board of Examiners in Optometry in an attempt to stop optometrists from using lasers. An Oklahoma District Court ruled the medical board did not have authority to sue the optometry board. The Court of Appeals concurred with the decision. However, in 1996 the Oklahoma Supreme Court overruled the District Court and the Court of Appeals.

This decision spurred the introduction of Senate Bill 995 in 1996 seeking to eliminate the Board of Medical Licensure and Supervision's ability to file suit against other licensing boards. The legislation passed when it was signed into law by Governor Frank Keating.

In 1997 Judge Eugene Mathews ruled in Oklahoma County District Court that the optometry Act did not authorize laser surgery and that only legislative action could accomplish this result.

Senate Bill 1192 was introduced in 1998 to codify and reinstate the previous privileges of optometrists to perform certain laser surgery procedures. The legislation was signed into law by Governor Frank Keating on March 16 that year.

The scope of practice as amended by the 1998 legislation was as follows (language specifically referencing the authority to perform laser surgical procedures was added) [deletions indicated by ~~strikethrough~~, additions indicated by underscore]:

"Section 581. A. The practice of optometry is defined to be the science and art of examining the human eye and measurement of the powers of vision by the employment of any means, including the use or furnishing of any self-testing device, the use of any computerized or automatic refracting device, the use of pharmaceutical agents, the diagnosis of conditions of the human eye and the correcting and relief of ocular abnormalities by means including but not limited to prescribing and adaptation of lenses, contact lenses, spectacles, eyeglasses, prisms and the employment of ~~visual training~~ vision therapy or orthoptics for the aid thereof, low vision rehabilitation, laser surgery procedures, excluding retina, laser in-situ keratomileusis (LASIK), and cosmetic lid surgery.
B. *The practice of optometry shall also include the prescribing of dangerous drugs and controlled dangerous substances for all schedules specified in the Uniform Controlled Dangerous Substances Act except Schedules I and II for the purpose of diagnosis and treatment of ocular abnormalities. ~~Provided, however, the~~ The practice of optometry shall not include the dispensing of drugs: ~~This shall not preclude~~ but may include the dispensing of professional samples to patients.*
C. Optometrists shall be certified by the Board of Examiners in Optometry prior to administering drugs, prescribing drugs, or performing laser surgery procedures.
D. Nothing in this title shall be construed as allowing any agency, board, or other entity of this state other than the Board of Examiners of Optometry to determine what constitutes the practice of optometry."

In 2004 organized medicine sought another attorney general opinion, this time asking whether the optometry law, as amended in 1998, authorized the performance of any surgery *other than* laser surgery. Organized medicine got the opinion they were looking for when the attorney general opined that the optometry board could not interpret the statute as allowing licensees to perform any surgery other than laser surgery.

The optometry board was able to convince the attorney general to pull and then revise that opinion – a very rare action on the part of any attorney general. But, based on the revised attorney general's opinion, the Oklahoma Association of Optometric Physicians found it necessary to go back to the legislature again to clarify the authority of optometrists to perform surgeries other than laser surgery.

The first attorney general opinion issued on March 15, 2004 (Okl. A.G. Opin. No. 04-9):

"It is, therefore, the official Opinion of the Attorney General that:
1. Title 59 O.S. 2001, § 581 does not authorize licensed optometrists to perform any surgical procedures other than laser surgery procedures (excluding retina surgery, laser in-situ keratomileusis (LASIK) surgery and cosmetic lid surgery).
2. Title 59 O.S. 2001, § 581 does not authorize the Board of Examiners in Optometry to determine that licensed optometrists are authorized to perform surgical procedures other than laser surgery procedures (excluding retina surgery, laser in-situ keratomileusis (LASIK) surgery and cosmetic lid surgery)."

W.A. Drew Edmondson, Attorney General Of Oklahoma
Debra Schwartz, Assistant Attorney General

The revised attorney general opinion issued on April 6, 2004 (Okl. A.G. Opin. No. 04-9):

"It is, therefore, the official Opinion of the Attorney General that:
1. Title 59 O.S. 2001, § 581 does not authorize licensed optometrists to perform any surgeries other than laser surgeries (excluding retina surgery, laser in-situ keratomileusis (LASIK) surgery and cosmetic lid surgery).
2. Title 59 O.S. 2001, § 581 does not authorize the Board of Examiners in Optometry to determine that licensed optometrists are authorized to perform surgeries other than laser surgeries (excluding retina surgery, laser in-situ keratomileusis (LASIK) surgery and cosmetic lid surgery).
3. ***Whether any particular procedure constitutes surgery is a question of fact which cannot be answered in an Attorney General's Opinion****. 74 O.S. 2001, § 18 b(A)(5).*
[emphasis added]
4. This Opinion replaces the previous version of Opinion

04-9 dated March 15, 2004, which is hereby withdrawn."
W.A. Drew Edmondson, Attorney General Of Oklahoma
Debra Schwartz, Assistant Attorney General

On April 21, 2004, House Bill 2321 was enacted clarifying that in addition to laser surgery procedures, non-laser surgery procedures (as defined by the optometry board) were included in the scope of practice. As charged by the legislature, the optometry board promulgated an emergency rule in October 2004 defining non-laser surgery. The emergency rule was made final through legislative approval in 2005. The rule adopted by the optometry board established a list of those surgical procedures that are excluded from the scope of services optometrists may perform.

The scope of practice as amended by the 2004 legislation was as follows [deletions indicated by ~~strikethrough~~, additions indicated by underscore]:

> *"Section 581. A. The practice of optometry is defined to be the science and art of examining the human eye and measurement of the powers of vision by the employment of any means, including the use or furnishing of any self-testing device, the use of any computerized or automatic refracting device, the use of pharmaceutical agents, the diagnosis of conditions of the human eye and the correcting and relief of ocular abnormalities by means including but not limited to prescribing and adaptation of lenses, contact lenses, spectacles, eyeglasses, prisms and the employment of vision therapy or orthoptics for the aid thereof, low vision rehabilitation, laser surgery procedures, excluding retina, laser in-situ keratomileusis (LASIK), and cosmetic lid surgery. The practice of optometry is further defined to be non laser surgery procedures as authorized by the Oklahoma Board of Examiners in Optometry, pursuant to rules promulgated under the Administrative Procedures Act.*
> B. *The practice of optometry shall also include the prescribing of dangerous drugs and controlled dangerous substances for all schedules specified in the Uniform Controlled Dangerous Substances Act except Schedules I and II for the purpose of diagnosis and treatment of ocular abnormalities. The practice of optometry shall not include the dispensing of drugs but may include the dispensing of professional samples to patients.*
> *C. Optometrists shall be certified by the Board of Examiners in Optometry prior to administering drugs, prescribing drugs, or performing laser or nonlaser surgery procedures.*
> *D. Nothing in this title shall be construed as allowing any agency, board, or other entity of this state other than the Board of Examiners ~~of~~ in Optometry to determine what constitutes the practice of optometry."*

While optometrists in Oklahoma have safely and effectively performed thousands of non-laser and laser surgical procedures since 1988, it took years of legal and legislative battles to clarify this authority.

Kentucky Laser Authority. In comparison to Oklahoma, the Kentucky experience establishing authority for optometrists to perform laser and non-laser surgery was not as complicated, nor drawn out. Having the benefit of the Oklahoma experience as a guide, the Kentucky Optometric Association drafted language for bill introduction in the 2011 legislative session that clearly and incontrovertibly defined the authority of optometrists to perform surgery and laser surgery; with the exception of 17 procedures. Senate Bill 110 was overwhelmingly supported by state legislators and signed into law by Governor Steve Beshear on February 24, 2011.[9]

The Kentucky Board of Examiners in Optometry was charged by the state legislature in Senate Bill 110 with promulgation of regulations to define the education and training required of optometrists in order to be authorized to perform the newly granted surgery and laser surgery privileges.

The five most significant features of Senate Bill 110 expanding the scope of practice for optometrists in Kentucky are, in ascending order:

5. Made crystal clear the optometry board's authority — ***within the constraints of the law as enacted by the legislature*** — to explain (interpret) the practice Act, including scope of practice (*the new language reinforced the authority the board already held*);

4. While adding the authority to perform laser and non-laser surgical procedures, the Act retained all of the basic fundamental components of optometric scope of practice including, but not limited to such services as: the examination, diagnosis, and treatment of the human eye and its appendages to correct and relieve ocular abnormalities and to determine eye health, the visual efficiency of the human eye, or the powers or defects of vision in any authorized manner; the use of autorefractors or any other testing means or devices; the prescribing, furnishing, use, or adapting of lenses, contact lenses, spectacles, eyeglasses, prisms, or ocular devices; and the employing of vision therapy, orthoptics, ocular exercises, or low vision rehabilitation;

3. Made clear the authority of optometrists to use or prescribe any drug via any route of administration *(with the exception of Schedule I and II controlled narcotic substances, laser or nonlaser injections into the posterior chamber of the eye to treat any macular or retinal disease, or the administration of general anesthesia)*;

2. For the first time in any state, a state official during a public health emergency may authorize optometrists to administer vaccinations or immunizations for systemic health reasons; and

1. For the first time in any state, a legislature repealed a prohibition against the performance of surgery by optometrists.[10]

Conclusion

Seventy years after optometrists were first licensed in the United States as a profession there began a 40-year curriculum and statutory scope of practice expansion effort that initiated a sweeping transformation of the profession from the expert, but "drugless" refractionists of the early 1900s, to detecting and referring eye disease at mid-century, to today's largest eye and vision care profession, providing patients access to safe and effective vision and medical eye care from their local doctor of optometry. However, it may take another decade or more of intensive grassroots legislative activity to establish a more uniform

medical eye care scope of practice among the various jurisdictions and complete the journey started 40 years ago in Rhode Island.

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2. Minnesota Senate Bill 188, Approved April 13, 1901.
3. According to the American Medical Association's Physician Masterfile (updated July 7, 2008), there are 23,861 ophthalmologists in the U.S. That number includes both active and inactive (retired, etc.) ophthalmologists. As referenced by the American Academy of Ophthalmology at http://www.aao.org/newsroom/press_kit/upload/Eye-Health-Statistics-June-2009.pdf, accessed October 5, 2011
4. Based on projections, there were 38,758 full-time equivalent optometrists in the workforce during 2010. Caring for the Eyes of America 2010, a Profile of the Optometric Profession, American Optometric Association, 2010
5. An example of a scope expansion law that included a sunset date which would have repealed the authority granted unless the sunset date was extended or removed by the legislature was Senate Bill 2356 enacted in North Dakota on March 22, 1979. This law expanded the scope of practice by authorizing the use of diagnostic pharmaceutical agents. Contained in the law was a provision that the authority of the optometry board to certify licensees to use diagnostic agents would sunset (expire) on June 30, 1981. However, on March 9, 1981, North Dakota Governor Allen Olson signed Senate Bill 2222 into law repealing the sunset provision and reaffirming the authority of the board to grant diagnostic certification to licensees who met board-approved education and training requirements.
6. Wuensch, RW. Memorandum to the membership of the Indiana Optometric Association; October 31, 1985.
7. ibid
8. CPT® is a registered trademark of the American Medical Association.
9. Kentucky Senate Bill 110 passed the Senate on February 11 by a vote of 33 to 3 (with one pass) and the House on February 18 with a vote of 81 to 14. The bill was signed into law by the Governor on February 24, 2011.
10. When enacting Senate Bill 110 repealing the prohibition against the performance of surgery by optometrists, the Kentucky legislature excluded, except for the pre-operative and post-operative care of these procedures, the following from the authority granted to perform laser and non-laser surgery:
    1. Retina laser procedures, LASIK, and PRK;
    2. Nonlaser surgery related to removal of the eye from a living human being;
    3. Nonlaser surgery requiring full thickness incision or excision of the cornea or sclera other than paracentesis in an emergency situation requiring immediate reduction of the pressure inside the eye;
    4. Penetrating keratoplasty (corneal transplant), or lamellar keratoplasty;
    5. Nonlaser surgery requiring incision of the iris and ciliary body, including iris diathermy or cryotherapy;
    6. Nonlaser surgery requiring incision of the vitreous;
    7. Nonlaser surgery requiring incision of the retina;
    8. Nonlaser surgical extraction of the crystalline lens;
    9. Nonlaser surgical intraocular implants;
    10. Incisional or excisional nonlaser surgery of the extraocular muscles;
    11. Nonlaser surgery of the eyelid for eyelid malignancies or for incisional cosmetic or mechanical repair of blepharochalasis, ptosis, and tarsorrhaphy;
    12. Nonlaser surgery of the bony orbit, including orbital implants;
    13. Incisional or excisional nonlaser surgery of the lacrimal system other than lacrimal probing or related procedures;
    14. Nonlaser surgery requiring full thickness conjunctivoplasty with graft or flap;
    15. Any nonlaser surgical procedure that does not provide for the correction and relief of ocular abnormalities
    16. Laser or nonlaser injection into the posterior chamber of the eye to treat any macular or retinal disease; and
    17. The administration of general anesthesia.

Figure 1

Examples Of Statutorily Defined Standard Of Care-Type Conditions, Restrictions, Or Limitations

NOTE: Depending on the diagnosis, progress, or unique circumstances of individual patients, every doctoral-level health care practitioner, based on his or her independent professional judgment and within appropriate standard of care guidelines for that profession, has a legal and ethical duty in some cases to limit the services he or she provides and/or refer the patient to another provider. However, based on the reality of political compromise that is sometimes required to enact legislation, over the years the legislature in more than 1 state has codified a requirement in the optometry Act to do for all patients what should be a professional medical judgment decision made for an individual patient. These mandatory "standard of care"-type provisions applying to all patients have been and continue to be repealed as part of the effort to establish more uniform scope of practice laws among the various jurisdictions.

Conditions
- An optometrist is required by statute to consult an ophthalmologist before, or shortly after, initiating treatment of all patients newly diagnosed with glaucoma.
- An optometrist is required to refer all patients with a certain condition or disease to a medical physician if there is no improvement within a statutorily defined period of time.

Restrictions
- An optometrist can prescribe a particular medication, but never for more than a statutorily defined period of time.
- An optometrist can prescribe a particular medication, but only to treat certain statutorily defined specific diseases.
- An optometrist is authorized to prescribe a particular medication, but in its topical form only.

Limitations
- An optometrist can only prescribe medications within certain statutorily defined classes of drugs.
- An optometrist can only prescribe medications listed on a statutorily required formulary.
- An optometrist is prohibited from treating certain diseases or disorders of the eye.

Table 1

States Where Diagnostic Use And Therapeutic Prescriptive Authority Were Enacted In The Same Legislation

STATE:	DIAGNOSTIC AND THERAPEUTIC AUTHORITY*
FLORIDA**	July 10, 1986
INDIANA**	May 13, 1991
NEW JERSEY**	January 16, 1992
NORTH CAROLINA	June 3, 1977
WEST VIRGINIA	March 4, 1976

FOOTNOTE:

* Some states went on at a later date to amplify the therapeutic authority gained in the original legislative victory.

** The legislation enacted in Florida and New Jersey in reference to diagnostic drug authority and in Indiana in reference to diagnostic and therapeutic prescriptive authority clarified earlier favorable Attorney General opinions based on the law at that time.

Table 2

States Where Full Prescriptive Authority Was Obtained In The Initial Therapeutic Law

[NOTE: This includes topical and oral drugs, the treatment of glaucoma, controlled narcotic substances, and use of injectables of some type.]

STATE:	FIRST TPA LAW	GLAUCOMA Tx	ORALS	CONTROLLED SUBSTANCES	INJECTABLES (anaphylaxis or other)
Alabama	June 20, 1995 (43)	June 20, 1995 (30)	June 20, 1995 (25)	June 20, 1995 (18)	June 20, 1995 (12)
North Carolina*	June 3, 1977 (2)	June 3, 1977 (2)	June 3, 1977 (1)	June 3, 1977 (1)	June 3, 1977 (1)
Utah**	March 20, 1991 (26)	March 20, 1991 (13)	March 20, 1991 (10)	March 20, 1991 (8)	March 20, 1991 (4)
Wisconsin***	August 3, 1989 (25)	August 3, 1989 (12)	August 3, 1989 (8)	August 3, 1989 (6)	August 3, 1989 (3)

The number in parentheses following the enactment date is the ranking order of enactment compared to the other states. For example, Alabama passed the 43rd TPA law, the 30th glaucoma treatment law, the 25th orals authority law, the 18th controlled substance authority law, and the 12th law allowing for the use of injectable agents of some type.

FOOTNOTES:

* The law enacted in North Carolina in 1977 authorized the use and prescription of all drugs. In 2005, policy was adopted by the State Board of Examiners in Optometry whereby optometrists meeting specific educational requirements were allowed to use injections for the treatment of chalazia, to perform peri-ocular injections for purposes other than for cosmesis, and to perform fluorescein angiography.

** The law enacted in Utah in 1991 authorized optometrists to prescribe drugs, but required optometrists at that time to prescribe drugs through protocols developed with supervising ophthalmologists. The only drugs excluded by the 1991 statute were Schedule II and III controlled narcotic substances. However, the protocols developed by individual supervising ophthalmologists may or may not have limited prescription to certain drugs only. The law was amended in 1997 when the supervision requirement was repealed and authority to prescribe oral drugs was clarified. The law was again amended in 2000 repealing the prohibition on the prescription of Schedule III controlled narcotic substances.

*** The law enacted in Wisconsin in 1989 required use of a formulary that still exists today. The only drugs specifically excluded by that law were Schedule I and II controlled narcotic substances. The formulary developed to implement the law contained a long list of drugs authorized for prescription. Rulemaking in April 1994 amended the formulary one final time to add authority to prescribe "*any drug which is used for an ophthalmic therapeutic purpose*."

Table 3

The Date Legislation Was First Enacted Authorizing The Prescription Of Drugs, Glaucoma Drugs, Oral Drugs, Controlled Narcotic Substances, Or Use Of Injectable Agent

As of February 23, 2012.

(NOTE: ***The majority*** of the initial therapeutic laws were amplified in subsequent years, some multiple times.)

STATE:	FIRST TPA LAW (Rx any legend drugs)	GLAUCOMA Tx (Rx any topical or topical & oral)	ORALS (Rx any orals)	CONTROLLED SUBSTANCES (Rx any orals)	INJECTABLES (anaphylaxis or anaphylaxis & other)
Alabama	June 20, 1995 (43)	June 20, 1995 (30)	June 20, 1995 (25)	June 20, 1995 (18)	June 20, 1995 (12)
Alaska	June 11, 1992 (32)	June 11, 1992 (17)	Sept 7, 2007 (46)	Sept 7, 2007 (41)	Sept 7, 2007 (31)
Arizona	April 6, 1993 (33)	April 6, 1993 (19)	May 18, 1999 (36)	May 18, 1999 (28)	May 18, 1999 (19)
Arkansas	March 3, 1987 (14)	March 3, 1987 (9)	Feb 17, 1997 (33)	Feb 17, 1997 (24)	Feb 17, 1997 (17)
California	Feb 20, 1996 (47)	Sept 24, 2000 (45)	Feb 20, 1996 (28)	Sept 24, 2000 (31)	Sept 24, 2000 (21)
Colorado	April 20, 1988 (23)	June 8, 1996 (37)	April 20, 1988 (7)	April 20, 1988 (5)	April 22, 2011 (34)
Connecticut	May 27, 1992 (31)	May 8, 1996 (36)	May 27, 1992 (12)	May 8, 1996 (22)	May 8, 1996 (16)
Delaware	June 30, 1994 (40)	June 30, 1994 (27)	June 30, 1994 (21)		
D.C.	April 22, 1998 (50B)	April 22, 1998 (41B)	April 22, 1998 (34B)		April 22, 1998 (17B)
Florida	July 10, 1986 (12)	July 10, 1986 (7)			
Georgia	Feb 25, 1988 (21)	April 8, 1994 (26)	April 8, 1994 (19)	April 8, 1994 (14)	
Hawaii	June 24, 1996 (48)	April 30, 2004 (48)	April 30, 2004 (42)		April 30, 2004 (26)
Idaho	March 31, 1987 (15)	March 22, 1993 (18)	March 22, 1993 (13)	March 22, 1993 (9)	March 22, 1993 (6)
Illinois	July 14, 1995 (45)	July 14, 1995 (31)	July 14, 1995 (27)	August 17, 2007 (40)	August 17, 2007 (30)
Indiana	May 13, 1991 (3)*	May 13, 1991 (3)*	May 13, 1991 (3)*		
Iowa	May 31, 1985 (6)	May 7, 1987 (10)	May 31, 1985 (2)	May 7, 1987 (4)	March 28, 2002 (23)
Kansas	April 17, 1987 (17)	April 1, 1996 (34)	March 23, 1999 (35)	March 23, 1999 (27)	
Kentucky	Feb 7, 1986 (8)	Feb 7, 1986 (6)	March 25, 1996 (30)	March 25, 1996 (20)	March 25, 1996 (15)
Louisiana	June 1, 1993 (36)	June 1, 1993 (23)	June 1, 1993 (16)	May 27, 2005 (39)	June 1, 1993 (8)
Maine	June 25, 1987 (20)	April 2, 1996 (35)	April 2, 1996 (31)	April 2, 1996 (21)	July 3, 1995 (13)
Maryland	May 25, 1995 (42)	May 25, 1995 (28)	May 25, 1995 (24)**		May 25, 1995 (11)
Massachusetts	July 31, 1997 (50)				
Michigan	Dec 29, 1994 (41)	Dec 1, 1997 (40)	Dec 13, 2002 (39)	Dec 13, 2002 (33)	
Minnesota	May 11, 1993 (34)	May 11, 1993 (21)	May 19, 2003 (41)	May 19, 2003 (35)	May 19, 2003 (25)
Mississippi	April 7, 1994 (38)	April 7, 1994 (25)	March 16, 2005 (45)	March 16, 2005 (38)	March 16, 2005 (28)
Missouri	June 24, 1986 (11)	May 31, 1995 (29)	June 24, 1986 (4)	June 24, 1986 (2)	
Montana	April 23, 1987 (19)	Feb 24, 1999 (42)	April 23, 1987 (6)	April 23, 1987 (3)	Feb 24, 1999 (18)
Nebraska	March 26, 1986 (10)	March 3, 1998 (41)	June 10, 1993 (17)	June 10, 1993 (12)	
Nevada	June 29, 1995 (44)	May 29, 1999 (43)	June 29, 1995 (26)	May 29, 1999 (29)	
New Hampshire	June 29, 1993 (37)	May 18, 2002 (46)	June 29, 1993 (18)	June 29, 1993 (13)	June 29, 1993 (9)
New Jersey	January 16, 1992 (29)	January 16, 1992 (15)	August 7, 2004 (44)	August 7, 2004 (37)	January 16, 1992 (5)
New Mexico	April 5, 1985 (5)	April 5, 1985 (5)	March 17, 1995 (23)	March 17, 1995 (17)	April 2, 2007 (29)
New York	August 2, 1995 (46)	August 2, 1995 (32)			
North Carolina	June 3, 1977 (2)	June 3, 1977 (2)	June 3, 1977 (1)	June 3, 1977 (1)	June 3, 1977 (1)
North Dakota	April 10, 1987 (16)	March 23, 1997 (39)	April 10, 1987 (5)	March 23, 1997 (25)	April 10, 1987 (2)
Ohio	Feb 15, 1992 (30)	Feb 15, 1992 (16)	Feb 15, 1992 (11)	Dec 21, 2007 (42)	Dec 21, 2007 (32)
Oklahoma	March 22, 1984 (4)	March 22, 1984 (4)	April 13, 1994 (20)	April 13, 1994 (15)	April 13, 1994 (10)
Oregon	August 9, 1991 (28)	August 9, 1991 (14)	June 27, 2001 (38)	June 27, 2001 (32)	June 27, 2001 (22)
Pennsylvania	Oct 30, 1996 (49)	Dec 16, 2002 (47)	Oct 30, 1996 (32)	Oct 30, 1996 (23)	
Rhode Island	June 26, 1985 (7)	March 20, 1997 (38)	July 8, 2008 (47)	July 8, 2008 (43)	
South Carolina	May 14, 1993 (35)	May 14, 1993 (22)	May 14, 1993 (15)	May 14, 1993 (11)	
South Dakota	March 15, 1986 (9)	Feb 22, 1994 (24)	Feb 26, 1991 (9)	Feb 26, 1991 (7)	
Tennessee	April 22, 1987 (18)	May 5, 1993 (20)	May 5, 1993 (14)	May 5, 1993 (10)	May 5, 1993 (7)
Texas	June 15, 1991 (27)	June 19, 1999 (44)	June 19, 1999 (37)	June 19, 1999 (30)	June 19, 1999 (20)
Utah	March 20, 1991 (26)	March 20, 1991 (13)	March 20, 1991 (10)	March 20, 1991 (8)	March 20, 1991 (4)
Vermont	June 20, 1994 (39)	May 11, 2004 (49)	May 11, 2004 (43)	May 11, 2004 (36)	May 11, 2004 (27)
Virginia	April 11, 1988 (22)	March 8, 1996 (33)	March 8, 1996 (29)	March 8, 1996 (19)	March 8, 1996 (14)
Washington	April 18, 1989 (24)	April 18, 1989 (11)	May 7, 2003 (40)	May 7, 2003 (34)	May 7, 2003 (24)
West Virginia	March 4, 1976 (1)	March 4, 1976 (1)	April 18, 1997 (34)	April 18, 1997 (26)	April 2, 2010 (33)
Wisconsin	August 3, 1989 (25)	August 3, 1989 (12)	August 3, 1989 (8)	August 3, 1989 (6)	August 3, 1989 (3)
Wyoming	March 2, 1987 (13)	March 2, 1987 (8)	Feb 16, 1995 (22)	Feb 16, 1995 (16)	

The number in parentheses following the enactment date for each state is the order of enactment compared to the other states. For example, Alabama passed the 43rd TPA law, the 30th glaucoma treatment law, the 25th orals authority law, the 18th controlled substance authority law, and the 12th law allowing for the use of injectable agents of some type. In the case of the District of Columbia, the number in parentheses followed by a "B" indicates that D.C. was the next jurisdiction in the order of enactment after the state with that same number.

FOOTNOTES:

* General legislation, favorable attorney general opinion based on the law at that time. Legislation that would have prohibited pharmaceutical use defeated. Appeal from dismissal of litigation that would have prohibited pharmaceutical use denied by state supreme court, February 27, 1986. Clarification legislation adopted May 13, 1991.

****** Tetracycline and its derivatives for the diagnosis and treatment of meibomitis and seborrheic blepharitis are the only oral drugs authorized.

Table 4

States Where Authority To Prescribe Topical Steroids Was Not Granted With Initial Therapeutic Legislation

STATE:	INITIAL THERAPEUTIC LAW:	LAW AUTHORIZING TOPICAL STEROIDS:
CALIFORNIA	February 20, 1996	September 24, 2000
HAWAII*	June 24, 1996	June 18, 2002
MARYLAND	May 25, 1995	May 10, 2005
MONTANA	April 23, 1987	April 12, 1993
NEW HAMPSHIRE	June 29, 1993	May 18, 2002
PENNSYLVANIA	October 30, 1996	December 16, 2002

FOOTNOTE:

* The Hawaii legislature did not prohibit the prescription of topical steroids in the initial prescriptive authority law enacted on June 24, 1996. However, the formulary committee in place at that time, which included two optometrists, two ophthalmologists, and two pharmacists, did not include topical steroids on the formulary of authorized drugs. Legislation to repeal the formulary committee and specifically clarify the authority of an optometrist to prescribe topical steroids was enacted on June 18, 2002.

Table 5

States Where The Use Of Lasers For Certain Therapeutic Purposes Is Authorized

STATE:	USE OF LASERS FOR THERAPEUTIC PURPOSES
Kentucky	February 24, 2011
Oklahoma*	March 16, 1998

* This Act codified and expanded on a recognition by the Oklahoma Board of Examiners in Optometry during a February 1988 board meeting, as recorded in the minutes of the meeting, that "*when medically necessary, a qualified optometrist may utilize lasers, remove said stitches, and foreign bodies*."

Appendix B

February 15, 2019

Dear Members of the Wyoming Legislature,

AMVETS, which is also known as American Veterans, is the most inclusive Congressionally-chartered veterans service organization open to representing the interests of 20 million veterans and their families, including those in Wyoming. Since 1944, we have proudly served veterans and maintain a special focus on advancing quality health care and expanded access through the U.S. Department of Veterans Affairs (VA) health system.

On behalf of veterans in Wyoming, we are outraged to learn that VA policies are being mischaracterized and misrepresented by lobbying groups who are placing their own selfish organizational and turf concerns over the interests of America's veterans in need of access and choice for essential eye health care, including advanced procedures. In recent days, we have seen examples of such disgraceful tactics in Wyoming, and we call on the American Academy of Ophthalmology and the Surgical Scope Fund under their control to immediately cease and desist their false and misleading attacks.

The fact is that the Department of Veterans Affairs recognizes the importance of dedicated VA physicians, including doctors of optometry, practicing to the full extent of their education and training (VHA Directive 1231 – November 2016). Moreover, with regard to eye health care, the VA's eye care handbook specifically recognizes that optometrists and ophthalmologists are "equal partners" in caring for the eyes and vision of America's veterans (VHA Handbook 1121.01 – March 2011).

Thank you for the opportunity to set the record straight on this matter. We look forward to working with you and other leaders across the state to do more for veterans and their families who need and deserve assured access to essential high-quality health care.

Yours in service to our nation's veterans,

Joseph R. Chenelly
National Executive Director
AMVETS National Headquarters

SERVING WITH PRIDE

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Definitions:

Aberrations: a property of optical systems such as lenses that causes light to be spread out over some region of space rather than focused to a point. Aberrations cause the image formed by a lens to be blurred or distorted, with the nature of the distortion depending on the type of aberration.

Abscess: a painful collection of pus, usually caused by a bacterial infection, which can develop anywhere in the body.

Adnexa: the parts adjoining an organ.

Amblyopia: also called lazy eye, is a disorder of sight in which the brain fails to process inputs from one eye and over time favors the other eye. It results in decreased vision in an eye that otherwise typically appears normal

Blepharochalasis: inflammation of the eyelid that is characterized by exacerbations and remissions of eyelid edema, which results in a stretching and subsequent atrophy of the eyelid tissue, leading to the formation of redundant folds over the lid margins

Bony Orbit: the bones that constitute the margins of the orbits, that is the roof, medial and lateral walls and floor of the eye.

Bullae: a type of blister or fluid-filled sac that appears when fluid is trapped under a thin layer of skin.

Capsulotomy: a type of eye surgery in which an incision is made into the capsule of the crystalline lens of the eye.

Chalazion: a slow-growing, inflammatory lump in the oil gland of the eyelid.

Ciliary body: the ciliary body is a circular structure that is an extension of the iris and produces the fluid in the eye. Also contains the ciliary muscle, which changes the shape of the lens when your eyes focus on a near object.

Clinical Optometry: the practice of diagnosing and treating disorders of the eye to improve vision in a clinic or similar setting

Conjunctivoplasty: plastic repair of a defect in the mucous membrane that lines the inner surface of the eyelids and is continued over the forepart of the eyeball

Cornea: is the clear outer layer at the front of the eye, which helps your eye to focus light so you can see clearly.

Cryotherapy: the local or general use of low temperatures in medical therapy. Also may be used to treat a variety of tissue lesions.

Crystalline Lens: a transparent body in the eye, situated behind the iris, that focuses incident light on the retina.

Curettage: a medical procedure where tissue is removed by scraping or scooping.

Diagnostic and therapeutic pharmaceutical agent: any prescription or nonprescription drug delivered by any route of administration, used or prescribed for the diagnosis, treatment, prevention, or mitigation of abnormal conditions and diseases of the human eye and its adnexa, and visual system or those which may be used for such purposes, and approved narcotics when used in the treatment of disorders or diseases of the eye and its adnexa.

Diathermy: a medical and surgical technique involving the production of heat in a part of the body by high-frequency electric currents, to stimulate the circulation, relieve pain, destroy unhealthy tissue, or cause bleeding vessels to clot.

Electrocautery: also known as thermal cautery, refers to a process in which a direct or alternating current is passed through a resistant metal wire electrode, generating heat. The heated electrode is then applied to living tissue to achieve hemostasis or varying degrees of tissue destruction

Embryology: the branch of biology and medicine concerned with the study of embryos and their development.

Epiluminescence microscopy: a noninvasive technique that, by employing oil immersion, makes subsurface structures of the skin accessible for in vivo examination and thus provides additional criteria for the clinical diagnosis of pigmented skin lesions

Epithelial Debridement: removes your eye's clear protective outer layer of cells called the corneal surface

Etiology: the cause, set of causes, or manner of causation of a disease or condition.

Excision of the Cornea or Sclera: refers to the retrieval of ocular tissues, by cutting it separate from the ocular globe

Extraocular Muscles: a group of seven muscles, responsible for eye movement

Femtosecond: a unit of time, one quadrillionth or one millionth of one billionth of a second

Fluorescein Angiography: a medical procedure in which a fluorescent dye is injected into the bloodstream. The dye highlights the blood vessels in the back of the eye so they can be photographed.

Fundoscopy: An exam that uses a magnifying lens and a light to check the fundus of the eye

Fundus Autofluorescence: is an in vivo imaging method for metabolic mapping of naturally or pathologically occurring fluorophores of the ocular fundus.

Fundus: is the inside, back surface of the eye. It is made up of the retina, macula, optic disc, fovea and blood vessels.

Glaucoma: group of eye conditions that damage the optic nerve, which is often caused by an abnormally high pressure in your eye.

Gonioscopy: a painless exam used to check a part of your eye called the drainage angle. This area is at the front of the eye between the iris and the cornea. It is where fluid called aqueous humor naturally drains out of the eye.

Granuloma: is a small area of inflammation
Histology: the study of the microscopic structure of tissues.

In vivo: (of a process) performed or taking place in a living organism.

Intralesional injections: the direct injection of a therapeutic substance into a lesion or into the skin, to deliver a high concentration of medicine into the site of the pathology to maximize efficacy while minimizing systemic adverse effects of the drug.

Intramuscular injection: the injection of a substance into a muscle

Intraocular Implants: an artificial replacement for the lens of your eye, part of the surgery to fix cataracts

Keratectomy: surgical removal of a section or layer of the cornea, usually performed using a laser to correct myopia.

Lacrimal System: the physiological system containing the orbital structures for tear production and drainage

Laser trabeculoplasty: a laser treatment used to reduce pressure in the eye (intraocular pressure). The goal of the procedure is to relieve intraocular pressure by stimulating the internal drainage system allowing adequate outflow of fluid (aqueous humor) from the eye.

Lid Lesion: a pathological change in the tissue of the eyelid.

Nasolacrimal: also called the tear duct, carries tears from the lacrimal sac of the eye into the nasal cavity.

Oculoplastic: a wide variety of surgical procedures that deal with the orbit, eyelids, tear ducts, and the face. It also deals with the reconstruction of the eye and associated structures.

Ophthalmic surgery: a procedure upon the human eye and adnexa in which in vivo tissue is injected, cut, burned, frozen, sutured, vaporized, coagulated, or photodisrupted by the use of surgical instrumentation such as, but not limited to, a scalpel, cryoprobe, laser, electric cautery, or ionizing radiation. Nothing in this chapter shall limit the ability of a Doctor of Optometry to perform ophthalmic surgery procedures other than those listed in Section 5 of this chapter.

Paracentesis: is a form of body fluid sampling procedure

Pathophysiology: the disordered physiological processes associated with disease or injury.

Penetrating Keratectomy: helps remove and smooth the corneal surface after the epithelial debridement also understood as a full thickness incision

Penetrating keratoplasty or Corneal transplant: a resection of the patient's cornea, followed by placement of a donor corneal graft

Periocular: Situated or occurring around the eye or eyeball.

Peripheral Laser Iridoplasty: burns of iridoplasty pull the peripheral iris stroma away from the angle structures to deepen the angle recess

Peripheral Laser Iridotomy: a form of laser to create a hole in the iris, thereby allowing aqueous humor to traverse directly from the posterior to the anterior chamber and, consequently, relieve a pupillary block

Pharmacodynamics: the branch of pharmacology concerned with the effects of drugs and the mechanism of their action.

Pharmacogenetics: is the study of how people respond differently to drug therapy based upon their genetic makeup or genes

Pharmacokinetic: is a branch of pharmacology dedicated to determine the fate of substances administered to a living organism.

Photoablation: is the process of removing material from a solid (or occasionally liquid) surface by irradiating it with a laser beam

Photocoagulation: is eye surgery using a laser to shrink or destroy abnormal structures in the retina, or to intentionally cause scarring.

Photodisruption: is a form of minimally invasive surgery used in ophthalmology, utilizing infrared YAG lasers to form plasma, which then causes acoustic shock waves which then in turn affects tissue.

Pterygium surgery: growth of fleshy tissue that can remain small or grow large enough to cover part of the cornea, which grows on your eye's conjunctiva, the clear covering over the white part of the eye.

Ptosis: upper eyelid droops over eye

Puntal Plug: tiny devices that are placed in the eye's tear ducts (called puncta). Puncta are the tiny openings that drain tears from eyes. About the size of a grain of rice, the plug stops fluid from draining from the eye. This helps keep the eye's surface moist and comfortable, relieving itchy, burning and red eyes.

Radiofrequency surgery: non-invasive procedure that uses heat generated by radio waves to target specific nerves and temporarily turn off their ability to send pain signals. Needles inserted through your skin near the painful area deliver the radio waves to the targeted nerves

Radiosurgery: surgery using radiation, that is, the destruction of precisely selected areas of tissue using ionizing radiation rather than excision with a blade.
Retina laser procedures: a powerful, uniform beam of light with high intensity, used on the retina of the eye

Scleral: The white layer of the eye that covers most of the outside of the eyeball.

Selective Laser Trabeculoplasty: a form of *laser* surgery that is used to lower intraocular pressure in glaucoma. It is used when eye drop medications are not lowering the eye pressure enough or are causing significant side effects.

Sequelae: a condition which is the consequence of a previous disease or injury.
Seroma: is a collection of fluid that builds up under the surface of your skin

Strabismus: is a condition in which the eyes do not properly align with each other when looking at an object.

Subcutaneous injections: a short needle is used to inject a drug into the tissue layer between the skin and the muscle

Tarsorrhaphy: a surgical procedure in which the eyelids are partially sewn together to narrow the eyelid opening. Sometimes done to protect the cornea in cases of corneal exposure

Trabeculoplasty: laser surgery to create small openings in the trabecular meshwork of the eye from which the aqueous humor can drain to reduce intraocular pressure caused by open-angle glaucoma
Venipuncture: the puncture of a vein as part of a medical procedure, typically to withdraw a blood sample or for an intravenous injection.

Vitreous Chamber: the largest of the three chambers and is located behind the lens and in front of the optic nerve.

YAG capsulotomy: a special laser treatment used to improve your vision after cataract surgery.