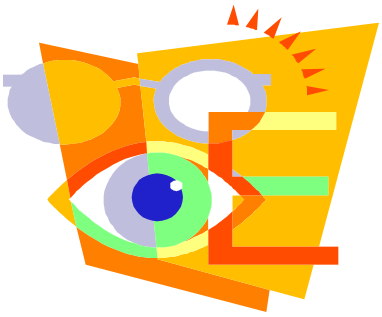
Optometry: A Career Guide



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This career guide was written and compiled by ASCO's Recruitment Materials Taskforce. The guide was written with the goal of providing a "core document" that could represent the most current, consistent and reliable information on optometry as a career for use by prospective students and pre-health advisors. The material is intended for use by ASCO and its member colleges in any format that will make information about optometry accessible and available to those who express interest in the profession.

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I. DEFINITION OF THE PROFESSION

"Doctors of Optometry are independent primary health care providers who examine, diagnose, treat and manage diseases and disorders of the visual system, the eye and associated structures as well as diagnose related systemic conditions." American Optometric Association (AOA), 1997

Today the profession of optometry involves much more than just prescribing and fitting glasses and contact lenses. Doctors of Optometry are trained to evaluate any patient's visual condition and to determine the best treatment for that condition. They are viewed more and more as primary care providers for patients seeking ocular or visual care.

Conditions typically cared for by Doctors of Optometry are:

- corneal abrasions, ulcers, or infections; glaucoma; and other eye diseases that require treatment with pharmaceutical agents, management, and referral when necessary;
- visual skill problems such as the inability to move, align, fixate and focus the ocular mechanism in such tasks as reading, driving, and computer use, and in tasks related to hobbies and employment;
- the inability to properly process and interpret information requiring perception, visualization, and retention, such as that needed for most learning tasks;
- poor vision-body coordination as one interacts with the environment as in sports, occupations, and other everyday activities requiring spatial judgments; and
- clarity problems such as simple near or farsightedness or complications due to the aging process, disease, accident, or malfunction.

Doctors of Optometry also work to:

- diagnose, manage, and refer systemic diseases such as hypertension, diabetes, and others that are often first detected in the eye;
- provide pre- and post- surgical care of cataracts, refractive laser treatment, retinal problems, and other conditions that require pre- and post-surgical care
- encourage preventative measures such as monitoring infants' and children's visual development, evaluating job/school/hobby related tasks, and promoting nutrition and hygiene education.

II. OUTLOOK FOR THE PROFESSION

Optometry is the nation's third largest independent healthcare profession. With favorable working conditions, regular hours, and a minimum of emergency calls, it offers many career options and great freedom in choosing a location to live and practice. Optometrists provide the majority of primary vision care administered. Over half the people in the United States wear glasses or contact lenses. Even people who may not require corrective eyewear need regular care to prevent, detect, and manage eye disease.

Population Changes and the Optometry Profession

The aging of the U.S. population has had two effects on the practice of optometry. First, nearly one quarter of practicing optometrists are approaching retirement age. As the baby-boomer generation enters retirement, many aging optometrists are looking for younger doctors who can take over their practices or offer new specialties to their practices.

Second, as the population ages, optometry services will be in increasing demand. Ninety percent of Americans 45 years of age and over will require vision correction. The growing numbers of senior citizens with age-related eye diseases such as cataracts, glaucoma, diabetic retinopathy, hypertensive retinopathy, and macular degeneration will require increased services from optometrists.

Senior citizens are in a better position to consult optometrists following a change in the Medicare law in 1987, which authorized reimbursement to optometrists. Primary eye care examinations for individuals over the age of 65 performed by optometrists grew from 37 percent in 1987 to 50 percent in 2000.

Social and Legal Changes Affecting Optometry

Doctors of Optometry are highly valued by a population that is increasingly conscious of the benefits of good health and regular vision care. Rising personal incomes, the availability of employer-sponsored vision care benefits, and Medicare coverage for optometry services make regular eyecare provided by optometrists even more desirable and affordable.

As our society becomes more highly mechanized, vision requirements become more exacting. The number of persons needing professional help for near-point visual tasks, including both older patients and school children, is steadily growing. Increased demands for vision care result not only from population changes but also from an increased understanding of how good vision relates to driving, workplace requirements, student achievement, leisure activities, adjustments to aging and other areas crucial to a modern computer and technology-driven society.

Demand for optometry services is also expected to increase as state laws, which regulate optometric practice (similar to all medical professions), have expanded to place responsibilities for virtually all primary eyecare services on optometrists. All states in North America recognize that optometrists are trained to prescribe medications to treat eye diseases.

Most new opportunities for graduates are created by the retirement of optometrists, the establishment of new offices, the inclusion of optometrists in interdisciplinary practices, and the growth of group practices, in addition to the expanding scope of care provided

by optometrists. An increase in the number of corporate optometry locations has also created demand for optometrists.

The number of new practicing optometrists is limited by the fact that there are presently only seventeen schools and colleges of optometry in the United States and Puerto Rico with two additional schools in Canada. Class sizes are restricted and therefore the number of new graduates remains fairly constant. Federal data indicate that opportunities for optometrists are expected to grow about as fast as the average for all occupations through 2008 in response to the vision care needs of a growing and aging population, as cited by the U.S. Department of Labor, Bureau of Labor Statistics, the Occupational Outlook Handbook, 2000-2001 Edition.

Demographics of the Profession

According to the American Optometric Association, the demographic characteristics of optometrists entering practice today are quite different from that of older optometrists.

- More than 40 percent of ODs under the age of 40 are female compared to less than 3 percent of ODs over the age of 50.
- More than half of new optometry graduates are female.
- There are an increasing number of minorities in the OD workforce: nearly 13 percent of ODs 25-40 years old are members of minority groups, compared to six percent of ODs aged 41-50 and only four percent of optometrists over age 50.

There continues to be a significant need for underrepresented minorities in this profession. As a result minority students are encouraged to seriously consider a career in optometry and apply to the school/college(s) of their choice.

Professional Satisfaction

Practicing Doctors of Optometry experience keen satisfaction in their profession. The fact that many optometrists choose to practice on a part-time basis well into their retirement speaks highly of the rewards of the profession.

Adding to optometrists' satisfaction is the fact that increases in their incomes have outpaced inflation for the past 10 years. As managed care plans have lowered reimbursement levels for all healthcare providers, optometrists have responded by expanding their services to include more eye-health-related procedures, which assists their patients and has enabled their practices to grow.

III. NEW FRONTIERS IN EYECARE

New technologies have helped the profession of optometry to expand both the scope and the efficiency of practice. Optometrists and their patients are benefiting from the many advances in eyecare and medical technology.

There has been a significant increase in the use of new and relatively new lens treatments, designs, and corrective materials such as contact lenses. Over the last few years, the number of contact lenses sold has increased substantially. About one-quarter of all contact lens wearers use either frequent replacement or disposable contact lenses.

Lasers

Lasers have been used for many years for treating eye diseases (such as diabetes, macular degeneration, glaucoma and some forms of cataracts) and for help with diagnosing visual problems. In recent years, the use of lasers to correct forms of refractive errors ("near-sightedness," "far sightedness," or astigmatism) has been increasing. Traditionally, these conditions were correctable only with glasses, contact lenses, and invasive surgery.

Doctors of Optometry play a key role in helping patients determine whether they are candidates for new procedures in laser surgery. When laser surgery is appropriate for a patient, optometrists provide nearly all pre- and post-operative care. Recent surveys indicate that nearly ninety percent of all optometrists are actively involved in managing refractive surgery cases.

The state of Oklahoma has optometric practice laws permitting optometrists to perform laser procedures. Pending legislation in other states may eventually enable the standard of care for optometry to include laser procedures.

Instrumentation

Technology is rapidly improving diagnostic instruments used by all healthcare practitioners. More accurate and efficient testing results enable Doctors of Optometry to better diagnose, manage, and treat eye disorders and diseases. Technology also helps optometrists educate patients about their conditions—long a hallmark of the profession—and allows patients to participate in their care and treatment decisions.

When the mapping of the complete human genome is complete, advances in gene therapy for eye-related problems will undoubtedly result. Already several errant genes

causing specific eye diseases have been identified, and treatment plans are most likely just around the corner, opening an exciting new era of eyecare.

Medication

New medications are developed each year that optometrists use to treat diseases of the human eye. This area, perhaps more than any other, reinforces the need for a well-rounded continuing education as the foundation of a Doctor of Optometry's lifelong service in a modern healthcare delivery system.

IV. MODES OF PRACTICE

Optometrists practice in many different kinds of situations and with different types of employers.

Solo Private Practice

The solo private practitioner usually is a primary care optometrist with a stand-alone practice. Such practitioners may specialize in fields such as

- Contact lenses
- Pediatrics
- Low vision/geriatrics

A solo practice may be in a variety of settings and locations ranging from a free standing structure to a professional building.

Partnership or Group Practice

This mode of practice is very similar to a solo practice except that there are two or more optometrists in the group. Each member of the group may specialize in a different area of practice. This is an increasingly popular form of practice.

Health Maintenance Organizations (HMO's)

An optometrist practicing in this setting usually is the primary eye care practitioner within a group of other types of primary health care practitioners. He or she may be employed or contracted by the HMO.

Retail/Optical Settings

In this setting, optometrists usually rent space from or are employed by a large retail outlet. However, they remain independent practitioners.

Optometric/Ophthalmologic Professional Settings

The optometrist practices in conjunction with the ophthalmologist and co-manages the patients in this setting.

Military/Public Health

Optometrists are commissioned officers who work in a hospital or clinical setting with other health care practitioners.

Interdisciplinary Care

The optometrist works with other health care practitioners in a hospital-based or clinic setting, such as the Department of Veterans Affairs (VA) Hospital, as part of an interdisciplinary team. Please note that some optometrists providing vision care in VA Hospitals are members of the military and some are not.

Academic/Research

This practitioner either teaches about primary care or performs research in a university setting. Academics pursue further training after optometry school and have completed a residency, M.S. or Ph.D. program.

Corporate/Industrial

Optometrists are employed by a large corporation to perform clinical research or to provide patient care in a clinic within the corporate setting.

Consultants

Optometrists work as consultants to industry, education, sports (high school to professional) and government.

V. INCOME POTENTIAL

Optometrists enjoy the benefits of financial security, independence, and recognition in their communities. According to the Jobs Rated Almanac (1999), which ranked the best jobs in the country according to income, stress, physical demands, potential growth, job security, and work environment, optometry ranked thirty-ninth out of 250 of the top rated jobs.

The American Optometric Association's 1999 Economic Survey indicates that at a

time when managed care and other economic pressures were expected to squeeze the finances of healthcare practitioners, optometrists are faring even better than the American economy as a whole.

Optometrists' median net income has outpaced inflation by 8.9 percent. According to the 1999 AOA Economic Survey, the average net income for optometrists was $108,262.00. The same survey revealed the following:

- Self-employed optometrists in solo, partnership and group practice continue to have a larger total individual net income than their counterparts employed in other settings.
- Practitioners in mid-sized (three-to-five person) groups have the highest average net income at $159,158.
- Those in small (two-person) practices earn $139, 451.
- Solo practitioners earn $112, 076.
- Practitioners in large partnerships or groups earn $111, 403.
- Practitioners associated with optical chains earn $99, 496.

Income may be limited only by the individual optometrist's initiative, since the majority of optometrists are in private practice. Partnerships and group practices are becoming common today because they reduce practice costs and offer specialized services more cost efficiently. Partnership and group practice also give optometrists more flexibility in arranging their work schedules.

The individual net income of optometrists, like that of most professionals, tends to rise with the number of years in practice.

- Optometrists in practice five or fewer years report an average income of $75,932.
- Those in practice six to 10 years average an income of $83,086, rising to an average of $106,114 for those in practice 11 to 15 years.
- Practitioners with 16 to 20 years in practice average $121,127 in net income.
- Optometrists with 21 to 25 years in practice reported the highest average earnings, $138, 017.

VI. OPTOMETRY SPECIALTIES

Most doctors of optometry practice "full-scope" primary care optometry and treat and manage all forms of visual and ocular conditions. However, a practitioner may choose to concentrate his/her practice on treating a selected population or visual condition.

Residencies are not required to develop a specialty. Since the four-year optometry curriculum prepares graduates in all areas, a residency does not introduce but rather enhances experience in a selected area. Therefore, even though the term "specialty" is

often used to identify a particular emphasis, there are no additional requirements that need to be met in order for a Doctor of Optometry to establish his/her practice as a specialist. Some of the more typical specialties found in optometry are:

Pediatrics: This specialty treats children's visual needs.

Infants: This specialty treats conditions that arise during the first four years of life.

Geriatrics: This specialty treats the elderly.

Cornea & contact lenses: This specialty treats conditions of the cornea with medication and/or contact lenses.

Low vision rehabilitation: This specialty treats clarity problems that cannot be remedied with routine lenses but that require more sophisticated magnifying devices. These patients are often classified as "legally blind," most often due to reduced retinal function.

Vision therapy (also referred to as Behavioral or Functional optometry): This specialty attempts to overcome deficiencies in how effectively a patient uses his/her eyes (as in the eye movements, aiming, fixating, tracking, focusing the eyes, etc.). Vision therapy also works with ways in which the patient processes visual information and interacts with the environment (as in problems of perception, visualization, retention, vision-body coordination, etc.).

Binocular vision: This specialty treats problems in which the two eyes do not work together effectively, causing discomfort or, in extreme cases, crossed eyes.

Sports vision: This specialty enhances visual skills required in sports.

Learning disabilities: This specialty enhances and improves those skills required in the learning task, especially relating to children.

Head trauma: This specialty improves various visual skills that have been lost due to a stroke or head injury.

Environmental & occupational vision: This specialty enhances those visual skills that are essential in a given work environment (e.g., occupations involving near point tasks such as computing/data entry, sewing, accounting, etc.) and/or provides appropriate eyewear (as in hazardous environments).

Ocular disease and special testing: This specialty treats and manages complex ocular diseases, often on a referral basis. In many cases, optometrists work with other physicians for systemic management of related diseases.

School consultant: Optometrists work with educators to establish an optimal learning environment and enhance the visual skills of the students.

Teaching and vision research: With advanced experience and/or degrees, an optometrist can be involved in optometric education or corporate research.

VII. A TYPICAL DAY IN THE LIFE OF AN O.D.

Each work day is different for Doctors of Optometry, and the scope and mode of practice in which the doctor is engaged can make the differences even more pronounced. If he/she "specializes," the day will be filled with evaluating new patients and providing the treatment particular to the area of emphasis. If the doctor is a member of a group practice, he/she may be the "specialist" in that group for certain kinds of patients or conditions. If the doctor is involved in a more commercial practice or as an employee, he/she may be limited by the dictates of the corporation or employer. If the doctor chooses to provide care in a nursing home or makes house calls, the patient demands and instrumentation available to him/her will be different from the doctor who consults in a hospital or a grade school. The self-employed doctor or a partner in a group practice can more easily set his/her own hours, whereas the doctor employed in other settings is less able to do so.

Most Doctors of Optometry are "generalists" and, assuming they provide full scope primary optometric care, their day can be quite varied and challenging. Patient interaction can range from performing routine visual exams, removing a foreign body from the cornea, evaluating a child who is not performing well in school, fitting a contact lens patient, prescribing medication for glaucoma, providing follow-up care after refractive surgery, and fitting a legally blind patient with a magnifying device that will enable the patient to read.

Typically, the doctor works with a technician who administers preliminary tests, advises patients on the use and care of contact lenses, and assists patients in selecting frames. The doctor spends time with the patient gathering more information, testing, making a diagnosis, determining the treatment required, and discussing the treatment regimen with the patient. The doctor records all information into the patient's record, dictating letters of referral if conditions like diabetes or hypertension are detected or letters to schools reporting on a child's visual status. An office manager or receptionist (depending on the size of the practice) may take care of completing information required by the patient's health insurance provider.

VIII. FUNCTIONAL STANDARDS FOR AN ADMISSIONS CANDIDATE TO CONSIDER

Following are the "Functional Standards for Didactic and Clinical Optometric Education." These standards were developed by the Board of Directors from the Association of Schools and Colleges of Optometry in 1998. Although developed for several reasons, the "functional standards" give prospective students an accurate idea of the skills required to perform the duties of an optometrist.

Functional Standards For Didactic and Clinical Optometric Education

One of the missions of each school and college of optometry is to produce graduates fully qualified to provide quality comprehensive eyecare services to the public. To fulfill this mission, each institution must ensure that students demonstrate satisfactory knowledge and skill in the provision of optometric care. Admission committees, therefore, consider a candidate's capacity to function effectively in the academic and clinical environments, as well as a candidate's academic qualifications and personal attributes.

To provide guidance to those considering optometry as a profession, the Association of Schools and Colleges of Optometry (ASCO) has established functional standards for optometric education. The ability to meet these standards, along with other criteria established by individual optometric institutions, is necessary for graduation from an optometric professional degree program.

The functional standards in optometric education require that the candidate/student possess appropriate abilities in the following areas: 1) observation; 2) communication; 3) sensory and motor coordination; 4) intellectual –conceptual, integrative and quantitative abilities; and 5) behavioral and social attributes. Each of these areas is described in this document.

In any case where a student's abilities in one of these areas are compromised, he or she must demonstrate alternative means and or abilities to meet the functional requirements. It is expected that seeking and using such alternative means and/or abilities shall be the responsibility of the student. Upon receipt of the appropriate documentation, the school or college will be expected to provide reasonable assistance and accommodation to the student.

Observation Abilities

The student must be able to acquire a defined level of required knowledge as presented through lectures, laboratories, demonstrations, and patient interaction a self-study. Acquiring this body of information necessitates the functional use of visual, auditory and somatic sensation enhanced by the functional use of other sensory modalities.

Examples of these observational skills in which accurate information needs to be extracted in an efficient manner include:

Visual Abilities: (as they relate to such things as visual acuity, color vision and binocularity):

- Visualizing and reading information from papers, films, slides, video and computer displays
- Observing optical, anatomic, physiologic and pharmacologic demonstrations and experiments
- Discriminating microscopic images of tissue and microorganisms
- Observing a patient and noting non-verbal signs
- Discriminating numbers, images, and patterns associated with diagnostic tests and instruments
- Visualizing specific ocular tissues in order to discern three-dimensional relationships, depth and color changes

Auditory Abilities:

- Understanding verbal presentations in lecture, laboratory and patient settings
- Recognizing and interpreting various sounds associated with laboratory experiments as well as diagnostic and therapeutic procedures

Tactile Abilities:

- Palpating the eye and related areas to determine the integrity of the underlying structures
- Palpating and feeling certain cardiovascular pulses

Communication Abilities

The student must be able to communicate effectively, efficiently and sensitively with patients and their families, peers, staff, instructors and other members of the healthcare team. The student must be able to demonstrate established communication skills using traditional and alternative means. Examples of required communications skills include:

- Relating effectively and sensitively to patients, conveying compassion and empathy
- Perceiving verbal and non-verbal communication such as sadness, worry, agitation and lack of comprehension from patients
- Eliciting information from patients and observing changes in mood and activity
- Communicating quickly, effectively and efficiently in oral and written English with patients and other members of the healthcare team
- Reading and legibly recording observations, test results and management plans accurately
- Completing assignments, patient records and correspondence accurately and in a timely manner

Sensory and Motor Coordination Abilities

Students must possess the sensory and motor skills necessary to perform an eye examination, including emergency care. In general, this requires sufficient exteroception sense (touch, pain, temperature), proprioceptive sense (position, pressure, movement, stereognosis, and vibratory) and fine motor function (significant coordination and manual dexterity using arms, wrists, hands and fingers). Examples of skill required include:

- Instillation of ocular pharmaceutical agents
- Insertion, removal and manipulation of contact lenses
- Assessment of blood pressure and pulse
- Removal of foreign objects from the cornea
- Simultaneous manipulation of lenses, instruments and therapeutic agents and devices
- Reasonable facility of movement

Intellectual-Conceptual, Integrative, and Quantitative Abilities

Problem solving, a most critical skill, is essential for optometric students and must be performed quickly, especially in emergency situations. In order to be an effective problem solver, the student must be able to accurately and efficiently utilize such abilities as measurement, calculation, reasoning, analysis, judgment, investigation, memory, numerical recognition and synthesis. Examples of these abilities include being able to:

- Determine appropriate questions to be asked and clinical tests to be performed
- Identify and analyze significant findings from history, examination, and other test data
- Demonstrate good judgment and provide a reasonable assessment, diagnosis and management of patients
- Retain, recall and obtain information in an efficient manner
- Identify and communicate the limits of one's knowledge and skill

Behavioral and Social Attributes

The student must possess the necessary behavioral and social attributes for the study and practice of optometry. Examples of such attributes include:

- Satisfactory emotional health required for full utilization of one's intellectual ability
- High ethical standards and integrity
- An empathy with patients and concern for their welfare
- Commitment to the optometric profession and its standards
- Effective interpersonal relationships with patients, peers and instructors
- Professional demeanor
- Effective functioning under varying degrees of stress and workload
- Adaptability to changing environments and uncertainties
- Positive acceptance of suggestions and constructive criticism

Certain chronic or recurrent illnesses, including infectious, psychiatric or substance abuse problems that interfere with patient care or safety are not compatible with optometric practice or training. Other illnesses, such as immune disorders, may lead to a high likelihood of student illness and should be carefully considered.

Candidates with questions or concerns about how their own conditions or disabilities might affect their ability to meet these functional standards are encouraged to meet with an optometry school counselor prior to submitting an application.

Approved by the ASCO Board of Directors on March 20, 1998

IX. THE OPTOMETRY CURRICULUM

Students must successfully complete a four-year accredited degree program at a school or college of optometry in order to earn the doctor of optometry degree. There are 16 optometry programs in the continental United States, one in Puerto Rico and two in Canada.

The sequence of course work varies from one program to another, but some general characteristics are shared by all. In the first and second year of the professional program, course work is concentrated in the basic health sciences (anatomy, physiology, pathology, biochemistry, pharmacology and public health), optics, and vision science. Students begin their clinical experience in a clinical simulation laboratory, with fellow classmates serving as patients, and then proceed to clinical training with "real" patients. This training includes taking case histories, performing examinations, learning diagnostic techniques, and discussing treatment services.

In the third year, students spend part of their time in the classroom and part of their time in the clinic examining patients.

Fourth year students continue their clinical training, which may include off-campus clinical externship rotations. Sites for rotation are available in the United States and abroad. Clinic settings include military facilities, veteran administration hospitals, public health service hospitals and various specialty and private practices. The lengths of the external rotations vary from eight to sixteen weeks.

After successfully completing the fourth year, students graduate with an O.D. (Doctor of Optometry) degree. To ensure a better understanding of the different educational programs, contact the specific schools or colleges of interest for curricular details.

Students graduating from schools and colleges of optometry have access to numerous resources that provide optometry practice (placement) opportunities. Students may obtain information from individual schools and colleges of optometry, state optometry associations, and the National Practice Resource Network, which is housed at the American Optometric Association office in St. Louis, Missouri. The phone number is 1-800-365-2219 and their web address is www.aoanet.org.

X. BECOMING LICENSED TO PRACTICE OPTOMETRY

Optometrists need to be licensed by the board of optometry in each state where they wish to practice optometry. Licensing assures that optometrists have met established standards of knowledge and are able to provide patient care.

All states either accept or require passage of Parts I and II of the National Board examinations offered by the National Board of Examiners in Optometry. Part I tests basic science knowledge obtained from the first two years of optometric study, and Part II tests knowledge of clinical science. States also require that the applicant pass Part III of the National Board that tests the candidate's ability to provide patient care, or a state-administered practical exam.

Each state has its own set of regulations governing the practice of optometry, and many states also require an optometrist to take an examination that tests the applicant's knowledge of the laws of that state.

An applicant can apply for licensure as early as the spring of the fourth year in the Doctor of Optometry program. If the applicant is successful in all parts of the National Board and other state examinations, the applicant can be licensed to practice optometry in the summer or fall of that year following graduation.

Becoming licensed to practice optometry in Canada requires passing the Canadian Standard Assessment in Optometry, which is administered by the Canadian Examiners in Optometry. In addition, each province has its own licensing body with specific requirements, such as provincial law and other exams. At least one province requires new graduates who were educated in the United States to have passed the United States National Board of Examiners in Optometry (NBEO test) in addition to the Canadian Standard Assessment in Optometry.

Periodic renewal of a license to practice optometry is required, depending on the state. Requirements for relicensure can be fulfilled through continuing education or other modes.

Post Graduate Programs

Residencies

Residencies in the profession of optometry are optional and not required either for licensure or for the establishment of a specialty practice. The four-year Doctor of Optometry degree encompasses all areas in which optometrists are licensed to practice. After a student receives the Doctor of Optometry degree, residencies are typically one year in duration and the resident receives a salary during this course of clinical training. Most often residencies are located within hospitals, Veteran Administration facilities, out patient clinics or the clinical facilities of the various colleges and schools of optometry.

Residencies vary within and typically are identified by specific areas in the profession or at a location in which these "specialties" are emphasized. (See heading VI, Optometry Specialties.)

Graduate Degree Programs

Graduate programs are not required in order to be licensed to practice the profession of optometry. In fact, these programs usually are research oriented and are for the individual interested in delving further into the "whys" and "hows" of the visual system.

A master's degree can be sought by someone who has an O.D. degree or who is simultaneously working on the O.D. degree. This individual usually plans to practice optometry but also wishes to be grounded in the basics of research in order to do some clinical research within his or her practice.

A Ph.D. degree is most often sought by someone intending to go into full time research and/or teaching. For those possessing a Ph.D., opportunities exist not only to teach and do research at a college or university, but also to engage in research within the corporate and government sector. Individuals can enter these programs with or without an O.D. degree. Some will choose to work on both the O.D. and the Ph.D. at the same time, taking approximately six to seven years to complete both degrees.

Graduate degree programs at schools and colleges of optometry are identified by different names, but all emphasize and explore some aspect of vision and the visual and ocular system.

XI. ADMISSION REQUIREMENTS

Since each optometry school may have slightly different admissions criteria, it is strongly recommended that applicants contact all the schools and colleges to which they are interested in applying. Each school can provide information on specific application deadlines, additional policies and procedures, class size, GPA and Optometry Admissions Test (OAT) averages, international requirements, and tuition and fees considerations. A complete listing of the schools and colleges of optometry is provided by the Association of Schools and Colleges of Optometry (ASCO) at www.opted.org.

No valid ranking of optometry schools exists. The best advice to a candidate is to obtain information from the individual schools, talk to recent graduates, visit selected schools and ask pointed questions of faculty and students.

Candidates should be most concerned with the academic rigor of a program, the clinical experience offered, and the availability of faculty and support services. Of course, the cost of the program, availability of financial aid, and the location and environment of the college can be contributing factors in deciding which program is best suited to the candidate.

Generally, colleges of optometry admit students who have demonstrated strong academic commitment and who exhibit the potential to excel in deductive reasoning, interpersonal communication, and empathy. Optometry schools are looking for "well-rounded" candidates who have achieved not only in the classroom but also in other areas. Leadership ability, a disposition to serve others, and a work ethic characterized by dedication and persistence are just a few of the qualities that impress most admission committees.

To be eligible for admission to any of the seventeen schools and colleges of optometry in the United States including Puerto Rico, one must first apply to the individual school(s) of his or her choice. The following are common components required for admission to any of the schools and colleges:

- A properly completed application for admission, including a personal essay
- Official transcripts from all colleges attended
- Official Optometry Admission Test (OAT) scores
- Letters of recommendation
- Optometry experience/exposure
- Personal interview

A student's academic evaluation is based upon overall GPA, science GPA, college attended, degree progress, and course load difficulty. A bachelor's degree is not required by most optometry schools but is strongly preferred. Most students major in the natural sciences in college (biology, chemistry, etc.) because the prerequisites for optometry school are science intensive. However, prospective students can major in

any degree discipline as long as they complete all of the prerequisite courses for optometry. Listed below are the common prerequisite courses for most optometry schools:

- General Biology w/labs
- General Chemistry w/labs
- Organic Chemistry/Biochemistry w/labs
- General Physics w/labs
- Microbiology w/lab
- Calculus
- Psychology
- Statistics
- English
- Social Science
- Other Humanities

Most schools consider an applicant's exposure to optometry to be of vital importance. Each applicant should become acquainted with at least one optometrist and if possible gain some first-hand experience to see what optometrists do on a daily basis. Most schools require personal interviews for admission, and experience/exposure to the field is often a topic for discussion.

Personal Essay

All schools require each applicant to write an essay about themselves and a specific topic relating to optometry. It is an important opportunity for applicants to describe themselves, highlight strengths, and indicate why they would be competitive candidates for admission to optometry school.

Optometry Admission Test (OAT)

The Optometry Admission Test (OAT) must be taken by all applicants seeking admission to schools and colleges of optometry. The testing program is designed to measure general academic ability and comprehension of scientific information achieved from college or university coursework. Examinations are administered twice a year, usually during February and October, at numerous U.S. and Canadian test centers. The most desirable schedule for applicants is to take the exam either in February of their junior year or in October of their senior year in college.

The OAT is scored on a 200 to 400 scale in increments of ten. The national average for the test is usually between 300 and 310. The test is comprised of six components: quantitative reasoning, reading comprehension, general biology, general physics, general chemistry and organic chemistry. The examinations are comprised exclusively of multiple-choice test items presented in the English language. Each edition of the examination is developed according to the examination outline. There are four parts to

the examination included in the Optometry Admission Testing Program. The entire program requires just over one half-day for administration.

Validity studies conducted by the testing program have shown that OAT scores, among other components, are useful in predicting performance in optometry school.

Candidates who are taking the Optometry Admission Test should complete at least entrance-level college courses in biology, general and organic chemistry, and physics. Applicants should note that test scores are developed in relation to all candidates participating in the examination and that most applicants complete two or more years of college before taking the examination.

Applications and preparation materials for the OAT may be obtained by writing or calling:

The Association of Schools and Colleges of Optometry (ASCO)
6110 Executive Boulevard, Suite 510
Rockville, MD 20852
(301) 231-5944 ext. 3001
E-mail: admini@opted.org

- OR -

Optometry Admission Testing Program (OAT)
211 E. Chicago Avenue, Suite 1846
Chicago, IL 60611-2678
(312) 440-2693

Test preparation courses

The Optometry Admission Testing Program has no data on the content or efficacy of test preparation courses designed to prepare candidates to take the OAT. The Optometry Admission Testing Program urges a careful review of test preparation courses to ensure that they reflect the current content of the OAT.

XII. FINANCING AN OPTOMETRIC EDUCATION

Students who are considering a career as an optometrist may be concerned that they do not have sufficient personal resources to cover all of the educational costs. The cost of attendance generally includes tuition, fees, books, equipment and supplies, and living expenses such as rent, groceries, insurance and transportation. The majority of students finance their education by a combination of personal and family contributions,

grants and scholarships, low-interest loans, higher-interest loans, and work-study opportunities.

As the overall costs of optometric education continue to increase, it is important that prospective optometry students begin to investigate potential financial aid sources as early as possible. As outside employment during optometry school is a limited option for the majority of students, and university sources of funds are also often limited, accepted applicants should contact their school's financial aid office early to explore their options and understand the school's financial aid policies and procedures.

Sources of Financial Aid

Accepted applicants should be aware of loans, scholarships, grants, and work-study, which provide the majority of aid to optometry students. Loans, which are the primary source of financial aid for optometry students, must be repaid after graduation. Scholarships and grants, which are merit-based or need-based, do not require the recipient to repay the award. Work-study gives students the opportunity to work part-time. In addition, there are state contract programs, which pay a portion of a student's tuition, and U.S. Armed Forces' scholarship programs, which require a service commitment following graduation.

The following list presents an overview of the most commonly used federal sources of assistance. Applicants are cautioned that requirements for the various loan programs may change or programs may be eliminated based upon actions of the government.

Loan Programs

1. Federal Perkins Loan
2. Federal Stafford Loan/Federal Direct Loan
3. Loans for Disadvantaged Students (LDS)
4. Health Professions Student Loan (HPSL)
5. Private Alternative Loans

Scholarship Programs

6. Scholarships for Disadvantaged Students (SDS)
7. State Contracts
8. Military Health Professions Scholarship

Applying for Financial Aid

The federal government and the optometry schools sponsor the majority of financial aid money available to optometry students. The applicant should begin by contacting the optometry schools he/she would like to attend. They will provide the applicant with

information on the programs they offer as well as forms and deadline dates. The following list identifies the forms and information generally required.

1. Free Application for Federal Student Aid (FAFSA)

This is the most important form, because the information from it is used to calculate the applicant's expected family contribution and determines eligibility for federal sources of financial aid. The FAFSA asks for information about the applicant, the applicant's spouse, and the applicant's parents. Although an applicant may be financially independent from his/her parents, parents may still need to fill out sections of the FAFSA because certain financial aid programs require that this information be considered. Once the form is complete, it is sent to the address noted on the FAFSA. This form can also be submitted on the web. There is no processing fee for the FAFSA.

2. Institutional Application

In addition to the FAFSA, optometry schools may require an institutional form, which is returned directly to the school. Schools do not charge processing fees for their financial aid forms.

3. Tax Returns

Optometry schools often require copies of the applicant's and the applicant's parents' most recent tax returns to confirm the financial information that was provided on the FAFSA and the other application forms.

4. Certifications

Students receiving funds, especially from federal sources, must attest to certain eligibility requirements. For example, students will need to vouch that funds were used only for educational purposes, that the student is not in default on a loan or owes a refund on a grant, and that the student is in compliance with selective service registration requirements.

Managing Educational Indebtedness

The majority of optometry students borrow to pay for the cost of their education. Borrowing means the student has the benefit of using someone else's money now in exchange for paying it back with interest at a later date. Students are legally obligated to repay their loans. Defaulting on a student loan has financial and legal consequences that can have negative personal and professional effects.

The vast majority of optometry graduates repay their loans either on time or early. The financial aid office at a specific college can provide information on management of a student's debt.

Resources:

AOA News,American Optometric Association
December 6, 1999
Volume 38 Issue 11

AOA News,American Optometric Association
Jan. 17, 2000
Volume 38 Issue 14

U.S. Department of Labor
Bureau of Statistics
Occupational Outlook Handbook Edition 2000-2001