

OPTOMETRY EDUCATION AND THE UNIVERSITY OF CALIFORNIA

Final Report of the Health Sciences Committee -- September 2004

INTRODUCTION

Vision and eye health are vitally important for all Americans. The ability to see and see clearly affects educational achievement, occupational productivity, and overall quality of life. Maintenance of visual acuity and a healthy visual system as part of overall good health is increasing in its priority to the public and health care community. Eye disease and vision impairment are elements in four of the five top public health issues recently described by the National Institutes of Health.¹ *Chronic illnesses* that are, or lead to, eye diseases include diabetes, hypertension, glaucoma, and cataracts. Individuals with diabetes are at substantially greater risk for blindness than the overall population. The incidence and severity of certain eye diseases and related disorders increase with age, and the *elderly population* is growing rapidly. *Health disparities* in the United States (U.S.) are exemplified by disproportionately high rates of glaucoma and cataracts in the Hispanic and African American communities, in which these diseases are the leading causes of blindness. In addition to these, *emerging diseases and co-morbidities* include conditions such as obesity, which predisposes individuals to diabetes and diabetic retinopathy – the leading cause of blindness for Americans under age 60.

The need for optometric care is life long. Among children, eye examinations are crucial for avoiding permanent visual and neural disabilities, yet a recent study² found that only 14% of children under age 6 have had an eye examination. More than 60% of Americans wear glasses or contact lenses, and adults have increasing needs for eye care as they age. As the public has become more aware of the importance of eye care, employers have expanded their insurance benefits to include more vision care plans.

The field of optometry centers on the diagnosis, prevention, and treatment of eye and vision diseases and disorders. An estimated 70% of eye care is delivered by Doctors of Optometry (ODs) who work with surgical and non-surgical subspecialists to deliver eye care to patients of all ages. The American Optometric Association³ defines optometrists as:

...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. Optometrists examine the internal and external structure of the eyes to diagnose eye diseases like glaucoma, cataracts and retinal disorders; systemic diseases like hypertension and diabetes; and vision conditions like nearsightedness, farsightedness, astigmatism and presbyopia. They prescribe ... vision aids, vision therapy and medicines to treat eye diseases.

THE OPTOMETRY WORKFORCE

More than 31,000 Doctors of Optometry practice in the U.S. Of these, approximately 4,000 practice in California.⁴ Two-thirds of optometrists are in private practice, working either as solo practitioners or in partnership with other optometrists, ophthalmologists, or other health professionals. The remainder

practice in a variety of settings, including hospitals, clinics, and community health centers; health maintenance organizations; commercial settings such as those affiliated with retail optical stores; military, public health, or other governmental facilities; industry (e.g., industrial safety programs, insurance companies, and contact lens and ophthalmic product manufacturers), and academic institutions. Some optometrists specialize in areas such as primary care optometry, family practice, infant/toddler/child care, elder care, low vision, sports vision, contact lenses, vision therapy, or vision in the workplace.*

Current Workforce Estimates and Needs

California currently has above the national average of optometrists per capita, ranking 9th among states, with 11.1 optometrists per 100,000 population by contrast to the U.S. average of 8.7 optometrists per 100,000 population. As in most health professions, there are challenges involving geographic distribution of optometrists, with insufficient numbers practicing in rural and urban underserved areas across the state. Also similar to other health professions, the ethnicity of optometry workforce does not reflect that of the state or U.S. population (Figure 1).

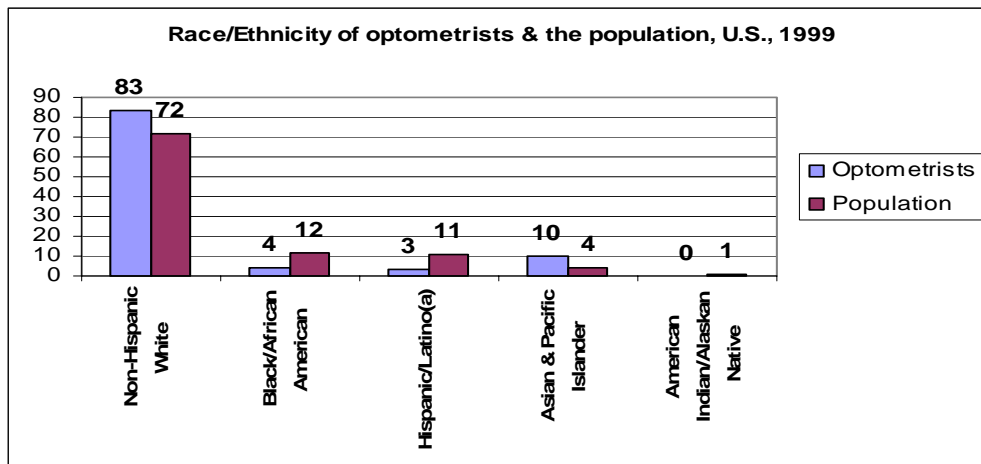


Figure 1: Race/Ethnicity of Optometrists and the Population, U.S., 1999

Source: U.S. Bureau of Labor Statistics; Bureau of the Census

Projections made by the U.S. Department of Labor⁴ indicate that employment of optometrists will grow by 10 to 20% between 2002 and 2012, or “as fast as the average for all occupations,” and that workforce needs will vary by census region. Pediatric and geriatric optometry are predicted to be the specialty areas of greatest need. Geographically, rural areas will continue to need more optometrists than urban areas, reflecting general trends involving shortages of health professionals.

* Optometrists differ from Ophthalmologists and Dispensing Opticians. Ophthalmologists are physicians who not only treat eye diseases and prescribe glasses/lenses, but also perform eye surgery; they are considered a surgical subspecialty in medicine. Dispensing Opticians fill prescription orders written by optometrists and ophthalmologists, fitting and adjusting glasses, and in some states (including California) contact lenses – as long as they do so under the supervision of an optometrist or ophthalmologist.

Factors that May Increase Demand

Increased patient volume. As the population ages and burden of chronic health conditions increases, the need for eye care will grow. California has the largest elderly population in the nation and this group is expected to grow at more than twice the rate of the overall U.S. population between now and 2020. People age 85 and older often need significant levels of eye care, due in part to their increased likelihood of developing cataracts, macular degeneration, diabetic eye complications, and glaucoma. Use of computers by individuals of all ages will increase demand for vision services. In addition, the field anticipates a shift toward increased preventive care and an expansion of eye care for children – both of which will increase the need for services.⁵

Wider scope of practice. The legal scope of practice for optometrists has expanded rapidly, albeit incrementally, over the last 25 years. The field has argued that as optometry's scope of practice expands, more people will gain access to eye care services. Laws have been passed in all 50 states allowing optometrists to employ drugs for diagnostic purposes, expand their responsibilities for post-surgical patient care, and prescribe therapeutic pharmaceuticals, although some variation by state remains.

Expanded insurance coverage. Growth in the number of employers offering vision care plans is expected to increase demand for optometrists. Sacramento-based Vision Service Plan (VSP), for example, is the largest provider of eye care benefits nationally, serving a total of 37 million members. VSP's total network includes 20,763 doctors nationwide, of whom 87% are optometrists and 13% are ophthalmologists. An estimated 65% of Californians are VSP members, and the plan offers a network of 3,815 doctors statewide. Claims data for the most recent year available show that OD's delivered 90% of all services provided to VSP members.⁶

Greater "market share" within managed care settings. As the scope of practice increasingly overlaps between optometrists and ophthalmologists, managed care plans are able to choose among providers for provision of vision services. It is predicted that optometry's market share relative to ophthalmology will increase, particularly in managed care settings. If a shortage of ophthalmologists materializes as some predict,⁷ due in part to a 16% reduction of residency slots between 1993 and 1998, further increases in employment of optometrists are considered likely.

Increased teaching and research faculty needs. A shortage of faculty at U.S. schools of optometry is predicted nationwide. Compounding existing shortages of junior faculty are expected increases in the retirement of current faculty and continued normal patterns of attrition. According to one study, these factors will lead optometry schools to need more new faculty members in the next 10 years than their entire current faculties,⁸ or an estimated 1,194 new faculty. Shortages of female faculty are projected to be even greater.

Underlying need for preventive services. The USDHHS *Healthy People 2010*⁹ document contains 10 specific objectives related to improving eye and vision care. If these objectives were achieved (e.g., if 75% of adults with diabetes were to receive annual eye examinations, instead of the 56% who currently do), the demand for optometric services would increase significantly. As described previously, the field also anticipates a shift toward increased preventive care and an expansion of eye care for children – both of which will increase the need for services.⁵ It is unknown, however, whether these objectives and trends will be realized.

Factors That May Decrease Demand

Increasing rates of entry into practice. An increasing number of optometrists are expected to retire within the next 10 years. However, more optometrists are expected to enter practice than will be leaving it, leading one recent workforce study⁷ to conclude that the supply of optometrists will increase steadily through 2030. This study, conducted by Abt and Associates and published in *Optometry*, also predicts that the increase in supply will be mitigated in part by the fact that many new optometrists are women, who tend to work fewer hours per week on average than their male colleagues.

Increased use of allied professionals. Demand for trained optometric assistants is increasing. If the supply of these allied professionals grows in response to demand, optometrists may be able to shorten their time per patient visit, allowing them to schedule more visits per day than currently occurs.

Factors That Will Variably Affect Demand

Increased development of new technologies. Emerging technologies in the areas of diagnostic imaging, adaptive optics, pharmaceuticals, and biologics may lead to a decrease in the time requirements for routine examinations. Some of these technologies, however, may increase demands on time, especially those that expand the range of diagnostic and therapeutic services available. To the extent that these new technologies become the standard of care, an increase in demand could result.

Increased use of laser vision surgery. The impact of recent increases in laser vision correction procedures on the need for optometrists is difficult to predict. Demand might increase in the near term, as optometrists continue to be engaged in the preoperative and postoperative care of laser vision patients. The longer-term scenario is more complex, given that patients who have had successful surgery may visit the optometrist less frequently in the years that follow. As those same patients age, however, they will need similar types of vision care as other persons their age (e.g., prescriptions for reading glasses and primary eye care examinations). Individuals for whom laser surgery is unsuccessful will need more vision care at a higher level of expertise.

OPTOMETRIC EDUCATION

There are 17 accredited schools and colleges of optometry in the U.S. and Puerto Rico. They offer three degrees, the most common of which is the Doctor of Optometry (OD). OD's can specialize in areas such as infant/toddler/child care, elder care, low vision, sports vision, contact lenses, vision therapy, vision in the workplace, pediatrics, and specialty contact lens care.

Eleven of the 17 accredited schools offer the Masters of Science (MS) degree, and 8 offer the Doctor of Philosophy (PhD) degree. Most graduates who earn MS or PhD degrees do vision research and/or teach in academic, medical, or private industry settings; others hold research positions in private institutes and federally sponsored agencies, including NASA and the National Institutes of Health.

The majority of optometry students hold an undergraduate degree from a college or university, although such a degree is required by only three of the nation's optometry schools. The University of California Berkeley and the Southern California College of Optometry are two of these three schools. Students then

complete four years of professional graduate level education at an accredited school or college of optometry to receive the OD degree. The teaching program for optometry students today is biologically and clinically intensive, placing demands on faculty that are similar to those in other health professions.

OPTOMETRY EDUCATION IN CALIFORNIA

Two schools offer optometry education in California: the University of California Berkeley School of Optometry (UCB) and the Southern California College of Optometry. UCB was formally established in 1941, although a program in optometry had been in existence since 1923. Its interdisciplinary PhD research training program in Vision Science began in 1946. Annually, UCB trains approximately 15 postdoctoral fellows within the laboratories of the Vision Science faculty. An average of four residents each year also work with the clinical faculty (see page 7). The school ranks at the top of its field nationally and internationally and makes substantial contributions to meeting state and national demands for clinicians, educators, and researchers.

The Southern California College of Optometry (SCCO) is a private institution that offers the OD degree and a residency program, but no Masters or Doctoral programs and comparatively fewer research opportunities. Approximately 50% of its entering class comes from outside the state.

Recruitment and Prerequisites

The majority of UCB's student recruiting takes place within California. Annually over the past 11 years, an average 69% of applicants were California residents, as were 80% of UCB's first year students. Over this same time period, the total number of applicants ranged from 188 to 370 and the total number of first-year students ranged from 60 to 66. The majority of applications come from UC schools, most often the Berkeley, Davis, Irvine, UCLA, and San Diego campuses. A smaller recruiting effort also occurs within the Western Interstate Commission for Higher Education (WICHE) states, which include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

UCB has more demanding prerequisites for admission than most schools. Enrollees are required to have completed courses in chemistry (general, organic, and biochemistry,) psychology, physics, biology, human physiology, and statistics. Many other schools of optometry include some of this coursework in their first-year curriculum. Because these rigorous prerequisites ensure a student body with an advanced level of preparation, UCB's faculty devote more time to clinical instruction, with students beginning their clinical training on the first day of school as opposed to more typical programs in which students begin such training in their second year.

Coursework

UCB students complete courses in basic sciences; genetics; bacteriology and immunology; neuroanatomy; systemic disease, and other topics. Completion of a research project (OD thesis) is a requirement for graduation. Clinical training covers a range of patient care activities (e.g., examinations, prescription of therapies, management of emergency procedures, and vision screening); advanced diagnostic procedures; low vision rehabilitation; and training in specialty clinics focused on ocular disease, contact lenses, binocular vision, ophthalmic optics, and environmental and occupational vision.

Other Training and Service Opportunities

In 1997, UCB signed a unique agreement with the UCSF School of Medicine that allows optometrists and ophthalmologists from each school to teach at the other school and to see each others' patients. Currently, there are only a small number of interdisciplinary training opportunities within the curriculum at the school. Increased numbers of courses and clinical training opportunities may be necessary in specialty areas that are predicted to have the greatest need in the future.

Public Service

The UCB School of Optometry includes within its mission a commitment to public service to the people of California and community-based training for its students. The school achieves these goals through its on-site clinics and by placing students at clinical externship sites throughout the state. The school also has a mobile clinic serving elementary schools in underserved urban areas as well as Native American rancherias; provides vision screening for children in Head Start programs (through an NIH grant,) YMCAs and Boys and Girls Clubs in the Bay Area; and sponsors outreach activities for elementary, high-school and college students regarding vision and vision care. UCB makes a significant contribution to state workforce needs in that a majority of optometry graduates remain in the state to practice.

Other Degrees and Post-OD Training

UCB has historically been a leader in the preparation of new faculty with research credentials in optometry and vision science. UCB's MS and PhD programs prepare students for careers in research and teaching in the areas of vision; the cellular, molecular, and genetic basis of eye disease; and eye care. Only six U.S. optometry schools offer PhD degrees in vision science – UCB, University of Houston, Ohio State University, Indiana University, State University of New York, and the University of Alabama, Birmingham. This places a special responsibility on these institutions for the training of new faculty for the future. UCB also provides specialty/advanced clinical training following OD graduation and licensure through its residency programs (see below.)

Licensure Requirements

Licensure to practice optometry in California requires that a candidate hold an OD degree; pass the three-part National Board of Examiners in Optometry (NBEO) examination, including a "hands on" clinical skills component; and pass the California State Board of Optometry's Laws and Regulations examination. Practicing optometrists in the State of California must also complete 50 hours of Continuing Education (CE) every 2 years covering a range of topics, that include glaucoma, ocular infections, use of pain medication, inflammation and topical steroids, and systemic medications. An addition 15 hours of "other" CE is also required.

UCB's longstanding program of continuing education offers a curriculum that meets state requirements governing both annual licensing and periodic mandates for special additional courses. As optometry's scope of practice has expanded, UCB has served as the responsible entity for providing state-mandated practice enhancement (e.g., Diagnostic Pharmaceutical Agents (DPA), Therapeutic Pharmaceutical Agents

[TPA), and Glaucoma Certification]. Consistent with its mission of providing lifelong learning for its alumni, the school is a major provider of CE for practicing optometrists in the state.

Residencies and Specializations

Nationwide, approximately 15 to 20% of new optometrists choose to complete a residency, which is typically a year-long program. Residency training at UCB is an important element of the school's teaching, research, and clinical service programs. Each UCB resident specializes in one of six clinical "tracks" – primary care, pediatrics, cornea/contact lenses, low vision/geriatric care, binocular vision, or ocular disease. All residents complete a research project within their specialty and assist in the instruction of OD students. Graduates receive a Certificate of Completion from the UCB Graduate Division. Following residency training, most UCB graduates seek part-time or full-time teaching positions. As faculty shortages materialize at many U.S. optometry schools, ODs with specialized residency training will be in high demand to fill clinical faculty vacancies.

UCB's highly competitive residency program attracts an average of 4.5 applicants for each position compared to a national average of 1.2 applicants per slot. UCB applicants are well qualified for training and typically score above average in their National Boards. Although the school has approval from the UC Berkeley Graduate Division to train as many as 12 residents per year, current enrollment is four or five residents per year. UCB's residency program has been limited in its potential due to the lack of stable financial support to fund salary and benefit costs for UC optometry residents. This limitation at UCB is unique among publicly funded schools, with the other seven U.S. schools receiving stipend funding through their university/institutional budgets. A subset of these institutions also use clinical revenues to fund residencies, and all, including UCB, rely on external funding sources to support some of their residency training slots (e.g., Veterans Administration or Indian Health Service).

Because UCB can accept only four or five residents each year, one or two of its six tracks do not fill. Allocation of slots is important because each residency track must have one resident in every two-year period or it will lose accreditation. The lack of stable funding for resident salaries also impacts other aspects of the program. When the number of residents is limited, fewer patients are scheduled for specialty clinics and fewer students have opportunities to gain experience in those specialty areas. Unlike U.S. medical schools and teaching hospitals where residents represent a core component of both teaching and patient care, UCB must rely extensively on clinical faculty, whose teaching and patient care activities are more costly to fund than when they are provided by residents in training.

Application Trends

Applications to all U.S. schools of optometry faced a downturn in 1999-2002, but these numbers increased again in Fall 2003. UCB's application trends are similar to national trends, tend to parallel those of other health professions, and often relate to overall economic conditions

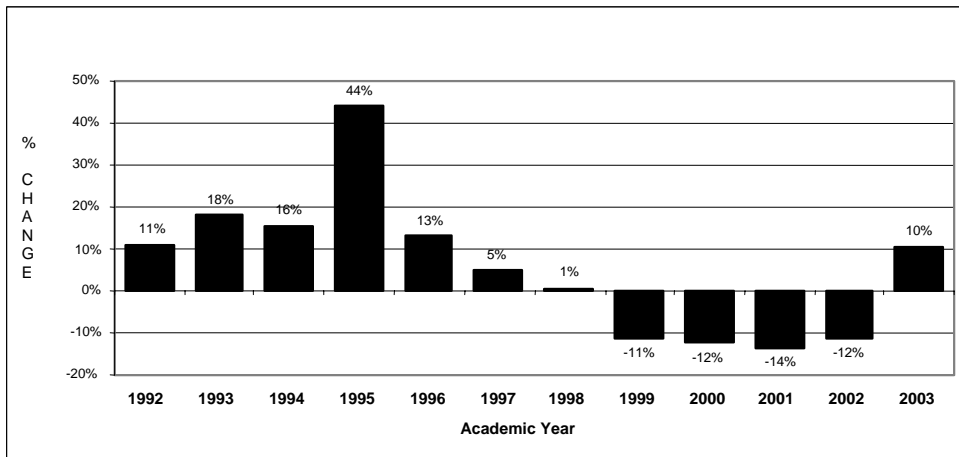


Figure 2. Percent Change in Number of Applicants to U.S. Optometry Schools, 1992 – 2004

Source: Association of Schools and Colleges of Optometry, 2003 Survey

Strengths of UCB

Top students and educational opportunities. The average scores of UCB students on the Optometric Admissions Test (OAT) are consistently among the highest of all programs in the nation. For many years, close to 100% of graduates pass licensure examinations. UCB is also recognized for innovation in education. Students gain in-depth clinical experience in both the school’s state-of-the-art eye center and during their three required 10-week rotations at various externship sites. Students also participate in research activities through the school’s Lions International Club Foundation Clinical Research Center.

Research productivity and research funding. UCB leads the nation in research grants from the National Eye Institute/National Institutes of Health, ranking first among optometry schools, and first for all optometry and ophthalmology departments in the UC system for both the number of faculty that receive NIH funding, and the research dollars awarded. Since 2000, the school has received \$52 million in NIH support.

Preparation of future faculty. UCB graduates are a major resource for academic optometry programs nationwide. Faculty at all but two of the nation’s schools of optometry include one or more UCB graduates. A small number serve as faculty at optometry schools overseas or teach in related fields such as ophthalmology or other sciences. At least 64 of UCB’s current faculty, in both clinical and basic sciences, are graduates of the school.

Challenges for UCB

Diversifying the student and faculty bodies. Since 1995, the ethnicity of the UCB student body has been predominantly Asian (average of 55%). The next largest ethnic group has been White (34%), followed by “foreign nationals,” “other,” Hispanic Americans, and African Americans. Among the faculty, the largest ethnic group is White (n = 51, or 67%), followed by Asian/Pacific Islander (n = 19, or 25%). The numbers of faculty who are Middle Eastern, Hispanic American, and African American are much smaller (n = 3, 2 and 1,

respectively.) Although the lack of diversity in the health professions is longstanding and national in scope, this profile clearly does not reflect the state’s overall ethnic diversity (see Figure 1).

Recruiting and retaining faculty. Although faculty recruitment has not yet been a challenge for UCB, a nationwide shortage of faculty at schools of optometry is predicted. As shortages develop – and as costs of living increase and UC salaries lag behind those of comparison institutions – faculty recruitment and retention will be greater challenges. The increasing demands on faculty time for teaching and patient care, together with the fact that funding formulas have not kept pace with increasing basic science and clinical teaching requirements, add further challenges for the school.

Supporting residency training. UCB’s residency programs attract many of the best and brightest new graduates in the field. Residency training is a vital part of UCB’s teaching and clinical mission, but the fact that the program receives no state contribution to support resident salary and benefits – and thus limited to only four or five residents per year – keeps the school from benefiting from many teaching and clinical care activities that a larger program would allow. These include expanded patient care services and increased preparation of specialists and new faculty.

SUMMARY OF FINDINGS

- 1. Optometrists provide an estimated 70% of eye care for Americans.** Optometrists serve as the “primary care” providers of vision care nationwide, providing diagnosis, prevention, and treatment of vision diseases and disorders to millions of Americans.
- 2. Workforce projections indicate a steady-state need for optometrists.** Studies predict there will be a steady need for optometrists within the next two decades. An increasing number of optometrists are expected to retire within the next 10 years. More optometrists are expected to enter practice than will be leaving it, however, leading one recent workforce study⁷ to conclude that the supply of optometrists will increase steadily through 2030. Although one study suggests an excess supply in some regions, others argue that this effect will be mitigated by the increased presence of managed care; the expanded scope of optometry practice; increases in vision insurance coverage; and greater numbers of female optometrists, who tend to practice fewer hours per week than their male colleagues.
- 3. Optometry faces a “maldistribution” problem.** The majority of optometry school graduates choose to practice in suburban or urban areas rather than in rural and other underserved areas. Although Californians may not feel the consequences of a maldistribution of optometrists as intensely as those involving physicians and other providers of urgent care services, shortage areas exist throughout the state.
- 4. There is a growing need for optometry faculty.** Studies predict a near-term shortage of optometry school faculty nationwide. This is due to current shortages of junior faculty, the pending retirement of large numbers of current faculty, and expected normal rates of attrition. As faculty shortages materialize, the need for residency-trained ODs is expected to increase significantly.
- 5. Geriatric and pediatric optometry are specialty areas of greatest need.** California has the largest elderly population in the nation and this group is expected to grow at more than twice the rate of the

overall population between now and 2020. As this occurs, and as leaders in public health and optometry work to heighten awareness of the need for childhood eye care, more practicing optometrists will be needed in geriatric and pediatric specialties.

6. **UCB is a leader in optometric education.** UCB graduates fill highly competitive jobs in clinical, teaching, and research settings. UCB and UCSF are overcoming traditional barriers between optometry and ophthalmology through a cross-campus teaching agreement. Although UCB faculty members are developing new and innovative ways to improve education, interdisciplinary training opportunities are infrequent and optometry students do not gain hospital experience as part of their professional preparation.
7. **UCB's residency training program lacks core funding for salary and benefits for its residents.** The school's residency program is competitive and is likely to become more so as increasing numbers of optometrists choose residency training. Despite its importance to the clinical and teaching missions of the school – and in contrast to other U.S. public schools and other UC health professions residency programs – UCB's residency program receives no state contribution toward funding for resident stipends or benefits. It is small in relation to the caliber of the school's faculty and the number of residents it could train. An increase in the number of residents would benefit the school in many ways, including expanded patient care services and increased preparation of specialists and new faculty.
8. **UCB is a leader in optometric research and research funding.** Because the school trains more optometric researchers than any other in the world and ranks first or second among optometry schools in federal research funding, UCB is considered a leader in vision science and research. Since 2000, the school has received \$52 million in NIH support; in most years, it receives more than half of all National Eye Institute/NIH grant award support to U.S. optometry schools.
9. **UCB students and faculty do not reflect the ethnic diversity of California.** An average 55% of the UCB students are Asian and 34% are White. Students who identify themselves as “foreign nationals,” “other,” Hispanic Americans, and African Americans make up significant lower percentages of the student body. The school's faculty also lacks diversity, particularly with respect to Latinos and African Americans.
10. **UCB is an important provider of continuing optometric education.** The school has an ongoing program of continuing education to meet requirements of state legislation governing annual licensing and periodic mandates for special additional courses. As optometry's scope of practice has expanded, UCB has served as the responsible entity for providing state-mandated practice enhancement. These activities are consistent with its public service mission and commitment to providing lifelong learning opportunities for UCB alumni.

RECOMMENDATIONS

1. **Maintain OD student enrollment at current levels** (~60 students per entering class). Although no shortage of practicing optometrists is predicted, the state will require a steady number of new graduates to replace those who leave the field to retire or pursue other activities.

- 2. Develop and support efforts to address faculty shortages.** To alleviate expected nationwide faculty shortages, UC should continue to fulfill its role as a major producer of optometry faculty. This involves actively recruiting students interested in becoming faculty; providing grants to support these students; offering ways to repay loan obligations through teaching; providing faculty with research support and graduate student and resident assistance; and monitoring workloads to ensure protected time for research activities.
- 3. Explore options for addressing faculty workload.** Instruction in optometry has become biologically and clinically intensive, and UCB's full-time faculty is small when compared to other UC health sciences schools that offer a four-year basic science and clinical teaching program. UCB would need to recruit approximately 20 additional faculty FTEs by 2010, without any increase in student enrollment, if more comparable resources were provided. The size of the school's residency program should be increased; greater numbers of residents to assist with teaching and clinical activities will help to address workload and faculty retention issues.
- 4. Encourage specialization in geriatrics and pediatrics.** Specialty areas with the greatest anticipated need include geriatric and pediatric eye care. The number of courses and training opportunities offered in these specialties should be increased and greater emphasis should be placed on these subjects within general coursework.
- 5. Increase efforts to meet the needs of underserved areas.** UC should contribute to increasing the number of optometrists practicing in rural underserved areas of California by continuing and expanding clinical training opportunities in these areas and supporting outreach to students and recruitment of applicants with an interest in future service to these communities.
- 6. Support interaction between optometry and ophthalmology and expand opportunities for interdisciplinary training.** UC should continue to pursue and support innovative mechanisms for interaction and collaboration between ophthalmology and optometry. In keeping with efforts across the health sciences schools, explore possibilities and new options for increasing interdisciplinary training opportunities.
- 7. Develop core university support to support salary and benefits for optometry residents.** UC should address the critical need for core support for UCB's residency training programs. Increase total training support, contingent upon adequate funding, to 15 on-site residency slots by 2007, and 20 slots by 2010. Providing stable support for the residency program would not only enrich the overall program, but also create predictably sized training programs and opportunities to meet existing training needs.
- 8. Increase the ethnic diversity of the student and faculty bodies.** Develop and support new efforts to diversify the student body and to recruit students from underserved communities. Continue participation in academic preparation/outreach programs to high school and undergraduate students and consider developing new "pipeline" initiatives similar to those supported by other UC health professions schools. Develop minority mentoring and preceptorship initiatives; incentives for hiring minority UCB graduates as UCB faculty; and incentives for minority graduates to pursue post-professional education (i.e., earning a PhD degree).

- 9. Maintain UCB's major role in providing continuing education.** Continue to respond to state mandates and serve as a responsible entity for providing continuing education required for annual licensing. This should take a variety of forms and involve locations that enable and encourage practitioners in rural and other underserved areas to participate.

Appendix A: General Scope of Practice

Optometrists provide the full range of primary eye health care services, which include virtually all eye care that most individuals will ordinarily require. Among these services, optometrists:

- Examine the internal and external structure of the eyes to diagnose and/or coordinate care for:
 - vision conditions, such as nearsightedness, farsightedness, astigmatism, and presbyopia
 - eye diseases, such as glaucoma, cataracts, and retinal disorders
 - systemic diseases, such as diabetes and hypertension
- Test the visual system to determine a patient's ability to focus and coordinate the eyes, to judge depth, and to see colors accurately;
- Prescribe eyeglasses and contact lenses, low vision aids, vision therapy, and medicines to treat eye diseases;
- Refer patients to other health care specialists, including surgical eye subspecialists;
- Provide pre- and postoperative eye care services for procedures ranging from cataract surgery to laser vision correction surgery; and
- Offer specialty services such as hard-to-fit contact lenses, low vision care, sports vision, pediatric care, older adult eye care, vision therapy, and occupational vision (including eye care for computer users).

Medicare covers the eye health part of an optometric examination (when the patient has a symptom or complaint that necessitated the visit) and treatment for eye disease prescribed by an optometrist.

Current Optometry Scope of Practice: Variation Across States

Domain of Treatment	Number of States permitting it
Removal of foreign body from the eye	50 states + DC + Guam + Puerto Rico
Diagnostic Drugs to facilitate examination	50 states + DC + Guam + Puerto Rico
Legend Drugs ^A prescribed to treat disease	50 states + DC + Guam
Legend Drugs specifically to treat glaucoma	49 states + DC + Guam
Oral Drugs prescribing authority	43 states + DC + Guam
Controlled Substance prescribing authority	37 states + DC + Guam
Injectable Drug prescribing authority	27 states + DC
Minor eye surgery (e.g., use of punctal plugs)	50 states

A = Legend Drugs = any prescription drug
 Source: American Optometry Association

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