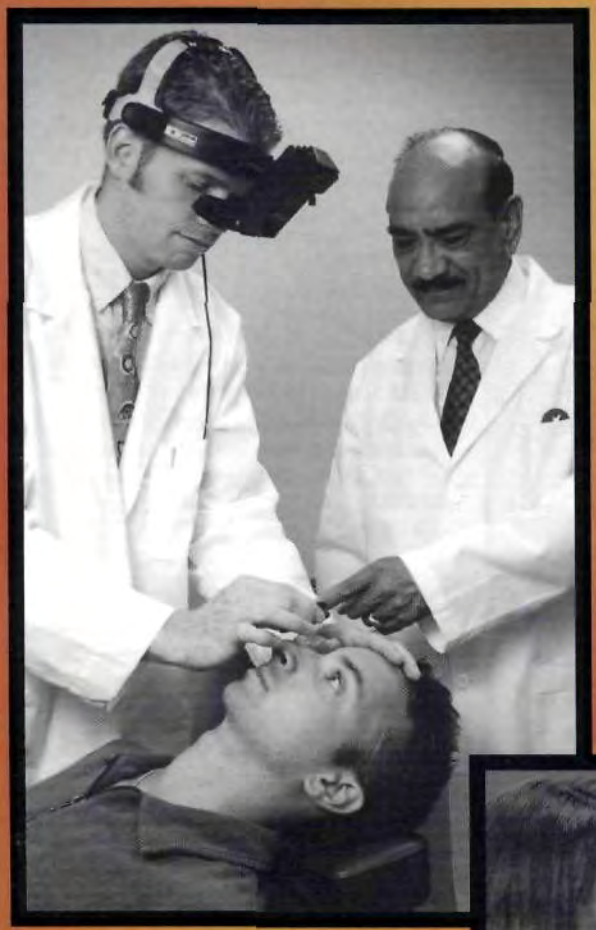
The Journal of the Association of Schools and Colleges of Optometry

# OPTOMETRIC EDUCATION

Volume 24, Number 1 Fall 1998



## Clinical Curriculum Reform

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## DEPARTMENTS



MEMBER

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GUEST

# EDITORIAL

# The Past, Present and Future of Externships in Clinical Education

Charles F. Mullen, O.D.

I believe that the future of Optometric externships in clinical education is of the greatest importance to us as educators, and to the future direction of the profession of optometry. I would even venture the opinion that where, and under what circumstances, clinical experience is gained by optometry students will determine the direction of clinical optometry.

Before presenting my thoughts on the future of externships, it might be useful to review where we are, and how we got here.

## The Past

Community based clinical education — commonly referred to as externships, — has its roots in the late 1960's. Several factors coalesced at that point in time to create the impetus for what was then a new direction for optometric education.

First, faculty and administrators had become increasingly aware of the need to enhance student-patient encounters, both in terms of quantity and in diversity of experience. This impetus was bolstered by increases in class size at several institutions. Space and patient volumes at many college-operated clinics simply were not adequate to meet student needs.

Second, and closely connected, there was a growing recognition that student-patient encounters would be more beneficial to the students' education if they took place in an environment outside the traditional academic environment. Supporting this view was the awareness of the need to train optometry students to interact with other health care disciplines.

Third, pressure was coming from practicing optometrists to expand the scope of our profession. Those of you who were in the service as optometrists in those days may recall that military protocols allowed optometrists greater latitude in treatment options, particularly in regard to pharmaceutical agents, than did state regulations. Having expanded their practice while in the Military, these optometrists were reluctant to step back into the more restrictive guidelines of civilian practice. They realized that optometry students, as well as the faculty, needed training in the use of pharmaceutical agents.

Fourth, several colleges of optometry had urban campuses, often in areas with significantly undeserved populations in terms of health care. These institutions had a strong commitment to provide eye care to those residing in proximal neighborhoods.

As a result of these concurrent pressures, several institutions, acting independently of one another, came to the conclusion that the most promising avenue for meeting these needs was to form networks of clinic affiliations with existing health care institutions. However, any illusions regarding the ease with which this strategy would be executed were quickly dispelled.

Those attempting to create externships encountered reluctance on the part of health center administrators to permit students to participate in their programs. Medical staffs were unfamiliar with Optometry, and the benefits optometry students could provide. Ophthalmologists did not have a history of interacting with Optometrists, and were often reluctant to do so. The new model of community based clinical education also aroused antagonism among community optometric practitioners who perceived it as an unwanted competitive threat.

Nonetheless, the need for externships was too great to be denied, and the creation of externships proceeded. These first externships shared several characteristics. Criteria for site selection and evaluation were ill defined. The terms of the affiliations themselves were not always well drafted. Student selection/assignment processes lacked consistency. The length of student rotations varied widely, from a half a day in some to a year in others. In too many instances there was little staff support from the parent institutions.

The first externships were located in a variety of settings, but primarily they were in community health centers, nursing homes, prisons, military facilities, public health facilities, the VA, university student health services, and even in some private practice settings.

Fortunately, many of these facilities encouraged, or even required, the use of pharmaceutical agents by optometrists. This experience would prove invaluable as optome-

*Dr. Mullen is president of the Illinois College of Optometry.* *These remarks were originally delivered to the Optometric Education Section at the December 1997 American Academy of Optometry meeting.*

try faculty were called upon a few years later to provide instruction in diagnostic and therapeutic agents as state practice laws changed.

Despite a rather awkward beginning, and with all the missteps and mistakes notwithstanding, the movement toward community based clinical education in the late 1960's had a profound impact on our profession, and must be considered one of the most important innovations in the development of optometric education. It was through the creation of these external affiliations, and the availability of large patient volumes, that the base was established for the subsequent growth of optometry into a true primary care profession.

## The Present

Today community based clinical education has expanded dramatically in terms of the quantity and quality of externships. A recent ASCO survey found that all the schools and colleges of Optometry responding reported that they had externship programs. The number of sites per institution ranged from 25 to over 200.

While great progress has been made, it has been uneven. In some areas the problems experienced by those early externships continue. However, most externships enjoy strong support from their parent institutions. Today's students typically serve two rotations of twelve weeks each. Student preference is an important consideration in the assignment process; housing, meals and a stipend are provided on a limited basis.

Today site selection and evaluation procedures are in place. Formal affiliation agreements provide guidance and define and expand responsibilities—but with varying degrees of thoroughness. In general those affiliations that include a government entity tend to be better defined than those that do not.

Externship preceptors are recognized with some form of faculty rank, often an adjunct appointment. Externships are predominantly located in government health care facilities such as those operated by the VA, the Indian Health Service or the Military. They are also found in public and private hospitals, rehab centers, and referral centers. They continue to be found in private practice arrangements, nursing homes, prisons, special needs schools, and university student health clinics. They are also located in community health centers and facilities operated by HMO's.

In general, the overall state of the national externship program is strong, significant in its impact, well managed and improving. It is firmly established as an essential component in the education and training of today's optometry student.

## The Future

What is the future of externships? As important as the externship has become, I would suggest today that its role is about to increase significantly. Once again forces are coalescing to create a climate conducive to, and even more demanding than the 1960's.

Today's health care environment is being driven by the demands of managed care and government that costs be reduced while quality and efficiency are increased.

In this environment I believe externships will become the primary source of clinical experience for optometry students. And while there will always be a need for some sort of sheltered workshop for clinical training of first and second year students, such as college operated campus clinics, the role of these clinics will be correspondingly diminished as the role of the externship grows in importance. Campus based clinical education will be limited to special emphasis areas such as pediatrics, vision rehabilitation and advanced ophthalmic care, while primary care education will be delegated to multiple affiliated health care facilities.

Just as several unrelated and related forces combined in the '60s to create the externship, a combination of forces at work in the '90s will once again drive their expansion.

The large numbers of close-at-hand underserved patients, once the backbone of institutionally based clinics, have become attractive to managed care providers as governmental units have turned to managed care to administer health care. Once spurned by third party payers as a burden, they are now sought by those who, unencumbered by an educational mission, are able to respond rapidly, efficiently and cost effectively. The ability of large single purpose eye clinics, such as those operated by most schools and colleges of optometry, is now seriously compromised.

Forced to allocate scarce resources to market to what was formally a virtually reserved patient base, such clinics are finding it even more difficult to be cost effective, if indeed they ever were. As patient numbers decline, educational inefficiencies increase, and operating deficits increase.

Externships, by contrast, are highly cost effective, offer a challenging clinical environment, and are often staffed by seasoned preceptors. This nicely compliments the basic clinical training provided by college faculty. The clinical experience gained at externships is both progressive and stimulating for students.

I believe, therefore, that the demand for more externships, geographically distributed, will increase in the years ahead. Longer rotations, and more rotations, will be the standard. Advances in communication, such as telemedicine and internet linkages, will make it easier for institutions to effectively manage a widely distributed externship network.

There exists today a vast, and largely untapped, potential within the federal sector for externships in optometry, where the growth will take place.

However, I must raise a cautionary note. We learned a great deal from the mistakes that were made in the '60s in the creation of externships, and we have benefited from that knowledge. However, that does not mean we must continue to rely on trial and error as the path to wisdom. To the extent that we are able, we must anticipate the problems that will inevitably arise from the creation of a national network of externships.

## The Challenge to Optometry

A significant challenge to us all will be the efficient and equitable use of this national network of externship sites by the schools and

*(Continued on page 26)*

# INDUSTRY NEWS

**CIBA Announces FOCUS® Express**

CIBA Vision now offers direct shipping of FOCUS® contact lenses to the patient through its FOCUS EXPRESS shipping program. "By offering the option of direct shipping, CIBA Vision has given practitioners a way to save money and offer a great service to their patients," said Steven T. Schuster, president of CIBA Vision North America. "We've had a great deal of positive feedback on the FOCUS EXPRESS program. Practitioners can offer patients the convenience of mail order combined with the benefits of a doctor's expertise and experience. Mail order houses simply can't compete with that." The direct shipping program replaces CIBA Vision's former Doctor Direct Delivery program. For more information on the program, call 1-800-241-5999.

**B & L Pharmaceuticals Launches New Steroid**

Bausch & Lomb Pharmaceuticals launched Alrex( (loteprednol etabonate ophthalmic suspension 0.2%), a new prescription ophthalmic steroid for the temporary relief of the signs and symptoms of seasonal allergic conjunctivitis. Over three million prescriptions are filled annually for seasonal allergic conjunctivitis, a common and troublesome eye inflammation usually caused by pollens. Bausch & Lomb Pharmaceuticals, Inc., in Tampa, is a Florida-based subsidiary of Bausch and Lomb Incorporated. For more information, contact 1-800-323-0000.

**Vistakon Introduces ACUVUE® BIFOCAL**

Vistakon, a division of Johnson & Johnson Vision Products, began a nationwide introduction of its new ACUVUE®(etafilcon A) BIFOCAL Contact Lens. According to Vistakon, the new lens offers exceptional performance and the lens-to-lens repeatability of other Vistakon lenses, as well as the outstanding comfort and eye health benefits of two convenient wear options: one-week disposable extended wear or daily wear, two-week replacement.

"The ACUVUE *BIFOCAL* will significantly enhance the lives of people who desire the freedom and convenience of contact lens wear, but have been discouraged by the bifocal contact lens options available until now," said Rusty Bard Pierce, Vistakon's executive vice president, sales and marketing. Pierce said that eye care professionals involved in premarket panel testing reported excellent overall product performance and fitting success with the lens, as well as excellent overall patient satisfaction. Survey findings for premarket test subjects fit with the new bifocal lens also indicate that 83 percent of subjects who purchased the lenses are continuing to wear them one year later.

**Paragon Continues "Toric Assured-Fit" Program**

Due to increasing interest and participation, Paragon Vision Sciences announced that its "Toric Assured-Fit Program" will be continued through December 31, 1998. This unique, new warranty program offers eye care practitioners risk-free and profitable contact lens fitting opportunities. The program features two of the company's advanced contact lens products for astigmats: oxygen permeable contact lenses, made by authorized manufacturing laboratories with the company's technologically-advanced oxygen permeable Paragon HDS™ material, and Flexlens™ Toric, one of the industry's most proficient soft toric contact lenses, according to Peter Fox, Paragon's director of North American marketing. For more information, contact Paragon's Customer Service team at 1-800-528-8279. Information also can be obtained at www.paragonvision.com .

**Wesley Jessen Announces Research Paper Awards**

Five optometry school students have been named 1998 winners of the Wesley Jessen Excellence Award for their original research papers on contact lenses or cornea related topics. "Wesley Jessen was founded by an optometry school professor, Dr. Newton Wesley, and his prize student, Dr. George Jessen. Wesley Jessen has remained committed to that heritage of highly valuing optometry school research," said Dwight H. Akerman, O.D., Wesley Jessen's director of professional services, about the Excellence Award program, which was begun in 1989.

The 1998 first place winner is Susan C. Han of the School of Optometry, University of California at Berkeley. The other four winners are: Indiana University School of Optometry's Marc J. Dubuc, O.D.; Sandra K. Carman, O.D., Illinois College of Optometry; Rosalie Lee, O.D., and Elizabeth Wyles, O.D., Southern California College of Optometry; and Holly Fisher, O.D., and Nancy Duquette, O.D., of the University of Missouri, St. Louis, School of Optometry.

**Marchon's Ads Return to Television**

Marchon Eyewear, Inc., the world's largest privately owned distributor of eyewear, announced its fall 1998 television ad campaign for their Flexon® frames. Following the extraordinary success in spring 1998 of the Rock Rote ads, a similar campaign began in September. The campaign consists of broadcast advertising on national cable networks: ESPN, CNN, HeadlineNEWS, A & E, the Discovery Channel and the History Channel., The Learning Channel, TBS, TNT, Fox's News Channel and Discovery's Animal Planet. Print advertising in USA Today will augment the national broadcast campaign. For more information, contact: Amy Romano (516) 755-2020, ext. 2361.

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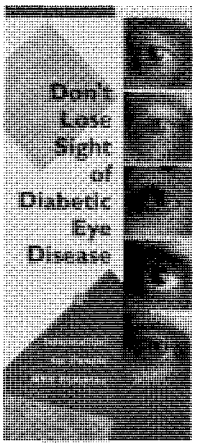
# NATIONAL DIABETES MONTH
## NOVEMBER 1998

## Increase awareness about diabetic eye disease and help reduce severe vision loss and blindness.

Of the 16 million people in America with diabetes, almost half will develop diabetic eye disease—a leading cause of blindness. Yet, more than 90 percent of these cases of blindness can be prevented through early detection and timely treatment.




Please join the National Eye Health Education Program in a nationwide effort to increase awareness of diabetic eye disease and the importance of receiving a dilated eye exam at least once a year for all people with diabetes.

NATIONAL EYE HEALTH EDUCATION PROGRAM

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*To receive a FREE National Diabetes Month Kit, call toll-free*

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National Diabetes Month is sponsored by the National Eye Health Education Program Partnership. The Partnership represents leading public and private organizations that are members of the National Eye Health Education Program, coordinated by the National Eye Institute, National Institutes of Health.

# ASCO Meeting Calendar 1998

**December 1998** (All meetings are at the San Francisco Hilton unless otherwise noted.)

10th – Public Affairs Network – noon–4:30 p.m.
Ritz-Carlton Hotel

11th – Development Directors SIG – 7:30 a.m.– noon
11th – Optometric Informatics SIG – 7:30 a.m.–10:30 a.m.
11th – Partnership Foundation for Optometric Education – 2:30 p.m.–5:30 p.m.

12th – Continuing Education Directors SIG – 7:30 a.m. – 10:30 a.m.
12th – Residency Educators SIG – 7:30 a.m. – noon
12th – Chief Academic Officers – 7:30 a.m. – 10:00 a.m.
12th – Ethics Educators SIG – 7:30 a.m. – 10:00 a.m.
12th – AOA/ASCO Joint Executive Committee — 2:00 p.m. – 4:00 p.m.

For the most up-to-date information on ASCO meetings, contact ASCO's website at http://www.opted.org

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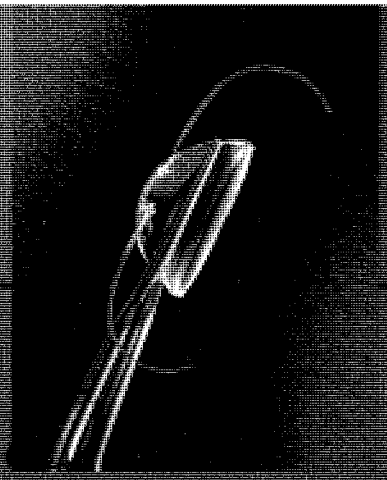



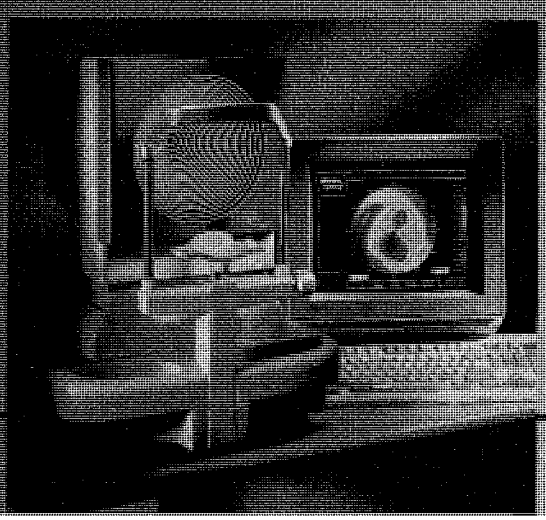

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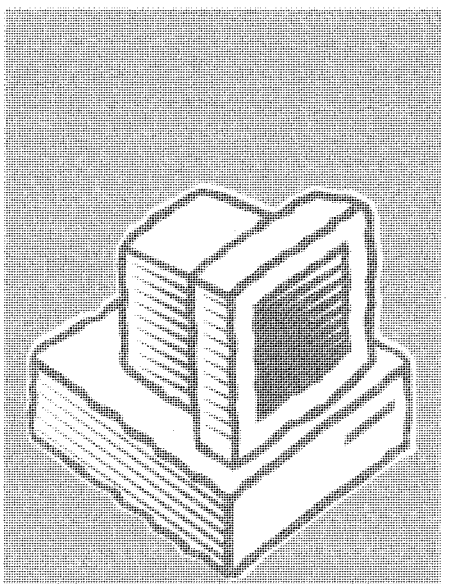
# Computer Software Reviews

**Virtual Eyecare Clinic: Anterior Segment.** R. Melton, R. Thomas. R Potvin, J. Holmes. University of Waterloo School of Optometry: Lifelearn Eyecare, 1998, $89.00 U.S. (extra $15 for continuing education supplement).

This is another in the Lifelearn Eyecare series of virtual office encounters. It consists of 25 patient vignettes for interactive diagnosis and treatment. In addition, there is a series of quizzes available.

The format for the Anterior Segment CD is that of a day in the office. The setting is realistic to the point of office photographs. The interaction begins with a click on the "OPTIONS" button to allow for consultative "help." The viewer can then go to the exam room and click on "next patient." Presenting information is displayed for the patient in the chair. It is then up to the doctor to select the tests indicated to diagnose the patient's problem. The diagnostic test information appears only after you select the appropriate test to perform. Armed with your selected data, you can make a diagnosis.

If your first diagnosis is incorrect, you are allowed to review the data, collect more, and select an alternative diagnosis. If your diagnosis is correct, you may proceed to the treatment phase or review the background information on the chosen diagnosis. It is interesting that if your diagnosis is incorrectly chosen from the menu, there is information helpful in getting to the correct diagnosis. You may also go back to do additional tests as well as to review the collected data. In other words, it is not a one-way street.



**Ordering Information:**

Lifelearn Eyecare
School of Optometry
University of Waterloo
Waterloo, Ontario
Canada N2L 3G1
(519) 885-1211, ext. 5408
fax: (519) 725-0784
e-mail: info@lifeye.uwaterloo.ca

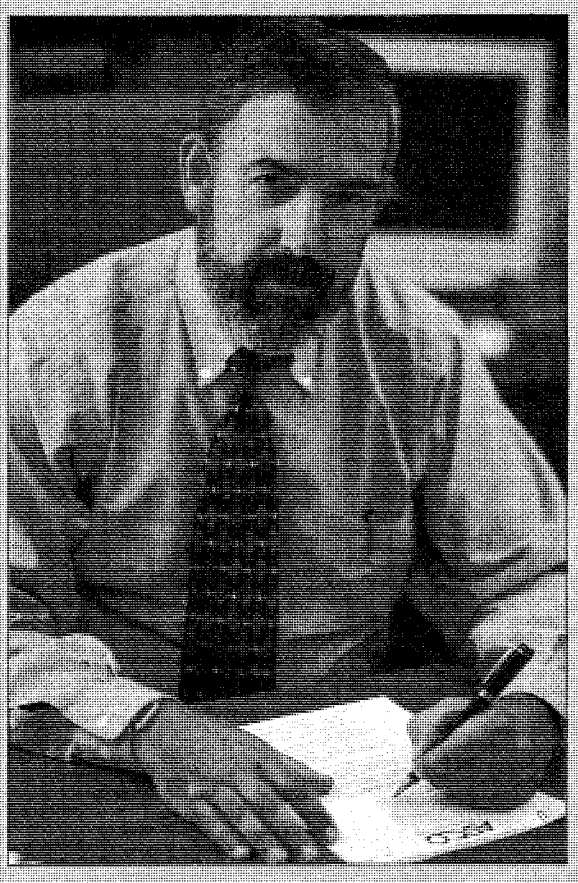
When the correct diagnosis and treatment plan are completed, the viewer is congratulated. When the treatment plan is selected (via menu), the viewer is told that it was completely correct or only partially correct. Suggestions are made to complete or alter the treatment plan. This enhances the learning capability of the package.

Although the viewer is warned of incoming phone consult requests, the interruptions are numerous enough to become slightly annoying. This feature, however, may be toggled off. In addition, the viewer has reference texts that may be opened for additional information.

All in all, this is a very cleverly designed and presented interactive package. If there is a negative criticism, it would be that some of the photos are a little out of focus. Should this be a barrier to any one wanting to add this CD to a library of anterior segment disease references? NO! Those who would benefit most from this nicely done presentation are those who may have little experience with treatment strategies or those who would like a review and update. It would be particularly useful for study groups.

**Reviewer:** Dr. Leo Semes
University of Alabama at Birmingham

# Focus on the President



*ASCO's new president, Alan L. Lewis, O.D., Ph.D.*

Alan L. Lewis, O.D., Ph.D., began a one-year term as ASCO's president in June 1998. A native of Holyoke, Massachusetts, Dr. Lewis studied liberal arts at Beloit College in Wisconsin, transferred to the Massachusetts College of Optometry (later renamed The New England College of Optometry) in Boston where he received B.Sc.Opt. and O.D. degrees. He pursued further education at The Ohio State University where he received an M.Sc. and a Ph.D. in physiological optics.

Dr. Lewis served on active duty in the Navy Medical Service Corps from 1965-1968 and retired as a Captain from the Naval Reserve in 1995.

In 1972 he joined the newly established SUNY College of Optometry as assistant professor and then professor. He also served at SUNY as assistant dean and director of graduate programs.

In 1991 he was appointed dean of the Ferris State University College of Optometry (later renamed the Michigan College of Optometry at Ferris State University).

Dr. Lewis has been active in many associations both within and outside optometry. He was chair of the Vision Science Section of the American Academy of Optometry and serves on the Commission on Ophthalmic Standards of the American Optometric Association. He is a member of several technical committees of the Commission Internationale de L'Eclairage (CIE) and is serving a four-year term as president of CIE/USA. He has served on various committees of the Illuminating Engineering Society of North America, most recently in the Lighting for Aged and Partially Sighted project.

Dr. Lewis is widely published and is a recognized authority on vision and light. He is a Fellow of the American Academy of Optometry and the Illuminating Engineering Society of North America.

Dr. Lewis was interviewed recently by Patricia O'Rourke, managing editor of *Optometric Education*.

**OPTOMETRIC EDUCATION: When you took over the gavel as ASCO president, you announced that your focus for the year would be on student indebtedness, which will also be the topic of the spring 1999 Critical Issues Seminar. Why do you think this issue is so critical now?**

**Lewis**: Student indebtedness has increased rapidly as the costs of an undergraduate and optometric education have outpaced inflation and as financial loans have become more available. Debt loads of more than $100,00 have affected the practice choices made by new graduates, and this problem has generated significant debate within the profession.

Unfortunately, information about the nature of student debt that is necessary to intelligently address the problem is seriously lacking. For example, we don't know much about why students go into debt; in many cases it appears that financial need and indebtedness may not be well correlated. To what degree do students take on large amounts of debt to finance purchases not directly related to their education? Are tuition and indebtedness correlated? To what degree does the availability of scholarships and work-study opportunities limit the student debt load? One thing is certain, if we are to assist our students in limiting and managing their debt, then we need to have a much better understanding of why they borrow and how that borrowing affects their post-graduation choices of practice mode and location. The Critical Issues Seminar in the spring of 1999 hopefully will begin to answer many of these questions and provide the schools and colleges with information that will help them better advise their students on the consequences of indebtedness on their future options.

**OPTOMETRIC EDUCATION: What are your goals for ASCO as you begin your year as president?**

**Lewis:** There are a number of serious issues facing the schools and colleges this year. Of particular concern to ASCO is the desire of the American Optometric Association to reduce its subsidy to the Council on Optometric Education and to redistribute the Council's funding among other constituencies – perhaps including the schools and colleges. Because most of the colleges are funded primarily by tuition dollars, such a redistribution has the potential to increase the financial burden on our students, a consequence not desired by either organization. We need to find an equitable solution to the problem of funding the important accreditation process that does not simply pass on those costs to the students.

A second goal is to maintain and enhance the applicant pool to our institutions. The number of students who are taking the optometry admission test is leveling off. While applications to optometry schools appear to be holding steady, there is a national trend toward fewer applicants to medical and dental schools, which may eventually affect us as well. We will need to carefully monitor our recruiting efforts to ensure that our profession continues to attract the large numbers of high ability students that we have enjoyed in recent years.

**OPTOMETRIC EDUCATION: You are the dean of one of the smaller optometry schools. What special challenges and opportunities does this present?**

**Lewis:** The Michigan College of Optometry is the second smallest optometry school in the continental United States with only 32 students per class, an enrollment that is appropriate to the size of our patient base in rural northwest Michigan and to the manpower needs of the upper Midwest region. Although the College is small, we enjoy being part of a large state university with nearly 10,000 students on campus. The major disadvantage of our small size is that we do not have the tuition base of our larger sister institutions and must be very efficient in order to provide a high quality educational experience at a reasonable cost. And to ensure that our students receive a clinical experience equal to or better than those optometry students trained in large urban clinics, we have developed a network of over 25 clinical sites from Alaska to Florida through which our fourth year students rotate.

On the plus side, our small classes mean that every student's strengths and weaknesses are known to our faculty who, in turn, can spot where more help may be needed or where opportunities for advanced learning can be employed. We are fortunate to have an exceptional faculty who make up in dedication and talent what they lack in numbers. Without a graduate program to support an intensive research effort, our faculty has emphasized the teaching mission and offers one of the more innovative curricula in the country. We are also blessed with a large applicant-to-accept ratio (approximately 10:1 in 1998) that gives us a remarkably able student body. We have a minimum of administrative overhead and function largely as a committee of the whole that allows a level of curricular coordination and integration that may not be possible at larger institutions.

**OPTOMETRIC EDUCATION: You bring a unique perspective to optometry from your work with national and international groups in vision and lighting. How has this activity affected your work as an optometric educator?**

**Lewis:** Although optometry is a health care profession, our education uniquely prepares us to serve as experts in designing the visual environment in order to optimize visual performance. Shortly after I began my first teaching position in New York, I was invited by Dr. Glenn Fry to participate in the Illuminating Engineering Society's committee that sets the lighting level recommendations for North America. At about the same time, because of my work in color vision, I was asked to join the CIE Technical Committee on Colorimetry where I became involved in drafting international standards. As a result of my participation in these organizations, I was able to meet and work on international committees with some of the pioneer scientists in vision such as Drs. Wright, Stiles, Guth, Nickerson, Verriest, MacAdam, Wyszecki, and Judd. In turn, my teaching is more effective and relevant because I can relate personal stories of the men and women whose names are attached to the "laws" that my students are learning. My research over the last 20 years has also been devoted to applying what we know about visual physiology to the problems of seeing in the workplace and in driving.

**OPTOMETRIC EDUCATION: Have you been particularly influenced by others in optometry?**

**Lewis:** Perhaps the greatest influences on my career in optometry were Dean Ralph Green, who was dean of the Massachusetts College of Optometry when I was a student, and Professor Glenn Fry, who served as a special mentor to me, not only in graduate school at Ohio State, but throughout my career until his death two years ago. Although seeming at first to be quite different, each man shepherded his school through the darkest days of our profession and each had a simplicity and humility that belied his greatness. Dr. Green taught me to trust both in myself and in the goodness of others; in the days before financial aid was widely available to optometry students, he personally financed interest-free tuition loans for many students (including me) with a handshake. Dr. Fry was, of course, a renowned scientist who expanded my horizons beyond patient-based optometry to the environmental conditions that govern much of what we see. A third important influence on my career was Dr. Carl Ingling who taught me that science can be both intellectually stimulating and great fun.

# Clinical Curriculum Reform and Advanced Care Training at The New England College of Optometry

Roger Wilson, O.D.

**Abstract:** *With the advent of increasing scope of practice legislation, the profession of optometry has rapidly increased the range of medical and other therapeutic services to patients. This phenomenon has led to recession of optometric curricula at the schools and colleges such that new and advanced clinical technologies, practice guidelines, and treatment protocols have been added to educational programs. This paper discusses how The New England College of Optometry has expanded clinical education so that graduates are equipped to handle new and advanced clinical and patient care responsibilities and meet the changing standards of professional entry level competency.*

**Key words:** *advanced care, clinical training, entry level competency, external rotations, Internet, remote learning, telemedicine*

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## Introduction

The practice of optometry, as defined by the American Optometric Association (AOA) and individual state laws, has expanded dramatically over the past decade. Nationwide, optometrists routinely provide medical treatment to patients, pre- and post-operative surgical care, and even engage in certain aspects of laser and limited surgical care. With increasing scope of practice and a continuing thrust toward amplification of therapeutic privileges, optometrists are compelled to be active life-long learners. The challenge for optometric education has always been how to engage in curriculum reform and provide training that reflects these important advances in clinical practice. There has already been much discussion about curriculum models for optometric education, including the body of knowledge and clinical experience that should be required in order to satisfy minimum competency standards for licensure. The most striking effort in optometric curriculum standardization and reform is found in the report generated from the Georgetown Summit on Optometric Education.[1] The Association of Schools and Colleges of Optometry (ASCO) has also recently discussed a position paper developed by its Entry Level/Curriculum Task Force that attempts to outline a model to be used for determining entry level competency for initial licensure.

The impact of these changes in practice patterns and entry level competency determination has profoundly affected the delivery of clinical education. Clinical faculty and administrators have a shared responsibility with academic faculty to ensure the transfer of new and vital didactic knowledge into clinical practice. Clinical faculty face the same challenges as didactic faculty: what aspects of clinical care should be taught in order to satisfy clinical competence of newly licensed practitioners, and at what expense to other elements in the clinical curriculum?

In 1995 the faculty of The New England College of Optometry (NEWENCO) made a decision to enhance the clinical curriculum (effective with graduates of the class of the year 2000) by providing students with additional clinical education in what was initially described as "advanced care" (see section entitled "defining advanced care"). The purpose of this paper is to outline the analysis that the College undertook in revising the clinical curriculum in order to provide advanced clinical training opportunities for all of its students, describe the planning, approval and development of the advanced care curriculum and other programmatic changes, report on how these improvements will be implemented, describe the future expansion capabilities and discuss plans to evaluate and monitor the clinical program.

## Discussion

### Overview of Clinical Education at NEWENCO

From the first moment a student matriculates at NEWENCO, emphasis is placed on becoming a doctor of optometry and the clinical practice of optometry. In the first year of the regular four-year program, the course *Optometry: Theory and Methods* lays the foundation for clinical care by teaching students the theory and practice of basic examination techniques and procedure to evaluate the patient's refractive, functional, and ocular (and systemic) health status. This is a combined lecture and clinical

laboratory course that runs throughout the first year. Student competency is periodically assessed through the administration of clinical proficiency examinations which are proctored by internal and external clinical faculty.

In the second year, preclinical and laboratory course work continue in the area of examination procedures related to ocular disease. Students gain competence in more advanced examination techniques and learn how to assess eye health. Students also begin preliminary patient care activities at the College's main clinical facility, the New England Eye Institute (NEEI), in the course *Introduction to Clinical Care,* which is a problem-based learning and clinical skills course. During the winter quarter of the second year students begin examining patients under the direct supervision of clinical faculty, with a faculty/student ratio of 1:2. The course continues through the spring quarter, with increasing patient exposure.

During the summer between the second and third year, students are assigned to clinical rotations at NEEI's Primary Care Service, Ocular Disease Service, the Home Eye Service (which provides community based eye and vision care), and other local affiliated outreach clinics. Course work during this special summer session includes contact lens lecture and laboratory, and pediatrics/binocular vision lecture and laboratory.

The third year of clinical training offers students greater patient diversity: they rotate through primary care at NEEI and numerous affiliated centers including the New England Shelter for Homeless Veterans, Pine St. Inn, Geiger-Gibson Health Center, neighborhood health centers, and local VA medical centers. Third year students continue to rotate through the glaucoma and retina consultative services at NEEI. The third year is also comprised of a full quarter of primary care contact lens clinic.

The final year is entirely clinical; through academic year 1998-1999 the assignments consist of three full-time 3-month rotations, and a primary care contact lens rotation. All students rotate through the College's extensive external clinic network of over 50 programs throughout the United States and at international sites. Each student is assigned to a multidisciplinary primary care rotation, an ocular disease rotation, and an elective in primary, secondary, or tertiary/rehabilitative care. This is typically scheduled over nine months, with one academic quarter being unassigned. As many as half of NEWENCO's students have used the unassigned quarter to take an additional clinical rotation, which is transcripted for credit as an "audit rotation."

Effective for the class of the year 2000 the final year will be comprised of four full-time 3-month clinical rotations, and a primary care contact lens rotation. As part of this program, students will be assigned to an advanced care rotation (which was piloted in academic year 1998) to fill in their previously unassigned quarter, thereby increasing the formal graded clinical program to four full quarters scheduled over twelve months. It is in the advanced care experience where students gain clinical experience in specialized ophthalmic and surgical

## Table 1
## Selected Learning Objectives in the Advanced Care Curriculum

- In the co-management of surgical cases the student will:
  - — provide pre- and post-surgical assessment of a patient including patient counseling and education
  - — understand normal outcomes and recognize and manage immediate and late-term complications
  - — understand clinical practice guidelines and referral standards for prospective surgical cases
- In glaucoma the student will:
  - — be able to diagnose, treat and monitor primary open angle glaucoma and acute and sub-acute narrow angle glaucoma, and participate in the care of patients with secondary glaucoma
  - — develop cognitive skills in the interpretation of findings from visual fields, gonioscopy, and stereoscopic disk evaluation
  - — be introduced to advanced techniques for imaging the optic nerve and nerve fiber layer
- In posterior segment disorders the student will:
  - — gain further experience in the technique and interpretation of findings from fundus contact lens assessment, photography, interpretation of fluorescein angiography findings, and ultrasound
  - — be familiar with clinical practice and treatment guidelines regarding pre- and post- operative management of retinal disease so that patients will be appropriately counseled
  - — be able to use scleral indentation as a clinical technique to aid in the differential diagnosis of fundus lesions
- In corneal disorders the student will:
  - — diagnose and manage corneal disease including surface disorders, ulcerative lesions, corneal dystrophies, and trauma
  - — be competent in corneal foreign body removal
  - — be aware of keratorefractive procedures and outcomes so that patients will be appropriately counseled and referred
- In laser certification the student will:
  - — understand the indications for anterior and posterior segment laser surgery by applying clinical practice guidelines in the management of patients
  - — understand the expected results of laser surgery and manage common postoperative complications following laser surgery
  - — be able to provide patient education and counseling regarding the effects, outcomes and results of laser surgery
- In advanced imaging including X-rays, MRI and CT scanning the student will:
  - — understand the indications for recommending or ordering the procedures
  - — understand the interpretive report and communicate findings to the patient
  - — be able to use the findings and apply them to the treatment and management strategies of the case

care, in addition to gaining further experience in the diagnosis and management of complex clinical problems. The advanced care rotation is also unique because of its Internet-based remote learning structure and introduction to telemedicine. CD-ROM and other multimedia clinical learning materials complement student learning at various rotations during this revised final year.

## Defining Advanced Care

The ocular and related systemic disease learning objectives in the advanced care curriculum (Table 1) are closely linked to clinical procedures that have flowed from the expanding scope of practice statutes over the past decade, including optometrists' involvement in pre- and post-operative care and managed care. As defined by NEWENCO, advanced care comprises those clinical skills and techniques that are not considered part of a "routine" primary care eye and vision examination. The College's definition of advanced care makes certain assumptions. Advanced care is defined as non-routine diagnostic and treatment components of an eye examination that are important and necessary to the diagnosis and management of more complicated patient problems.

The first step in determining what had to be taught clinically in advanced care was to evaluate the current clinical experience of the College's students. For many years the Department of External Clinical Programs had maintained detailed statistics on the numbers and types of patients that are seen by students in their final year while on external rotations. Using this information as a starting point, the Clinic Council (comprised of the Dean of Clinical Affairs, the chair of the Department of Clinical Skills and Practice, and the chair of the Department of External Clinical Programs) was able to determine which aspects of patient experiences were underrepresented.

The Clinic Council also took a discerning view about which aspects of clinical care would round out a comprehensive clinical experience for students in order for them to become successful future practitioners with the necessary patient management and health policy knowledge and skills to cope with health care challenges facing them in the 21st century. Therefore, the advanced care curriculum incorporated key aspects of health policy and risk management.

After the Clinic Council created the first draft of learning objectives for advanced care, the document was circulated to the entire clinical faculty for comments. After two more drafts had been circulated and feedback was received, the final draft was presented at the College's 1996 Annual Clinical Preceptors Conference.

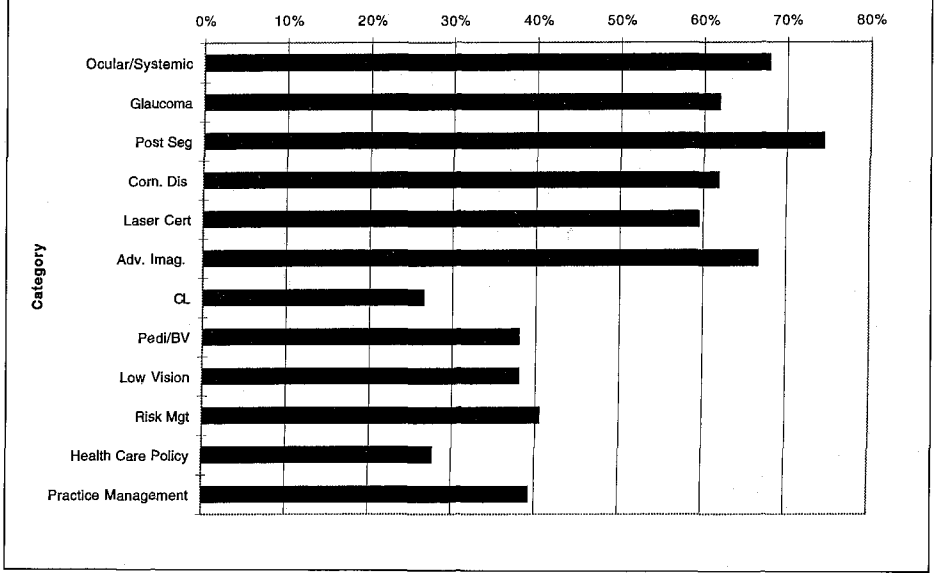
## Other Aspects of Curriculum Reform

The Clinic Council used the advanced care curriculum development time as an opportunity to evaluate other components of the clinical curriculum. To accomplish this, the Clinic Council referred to past evaluation reports from the Council on Optometric Education (COE). In the most recent COE evaluation (1995), it was noted that the College's students were felt to have an uneven, and in some cases limited, experience in the areas of pediatrics and binocular vision, and low vision. Therefore, the Council included a review of student encounters in these areas (as well as more complex contact lens problems) in its clinical curriculum analysis. Based upon the COE report and the internal review, the Clinic Council made the decision to include learning objectives in all of the above areas within the advanced care curriculum document, but as a sub-category encompassing "specialty care," since much of that information was arguably within the domain of primary care. These learning objectives are delivered within a newly created Specialty Care Rotation (Table 3).

## Planning and Development of the Advanced Care Curriculum

Once the advanced care curriculum document was complete, the College analyzed the students' current clinical experience to determine which components of advanced care were already being delivered. To accomplish this, a survey instrument was developed and sent to every clinic director within the College's network. Under each main category, the learning objectives were listed, and clinic directors were asked to designate whether an objective was "provided" or "not provided." The results were analyzed and a composite bar graph was created to illustrate the percentage of clinics that already offered the objectives (Figure 1). In addition to the individual clinic data, the Clinic Council was able to determine which components of advanced care (and also specialty care - defined above) were already in place, as well as those objectives, which were poor-

**Figure 1**
**Percentage of ACR Objectives Fulfilled by Existing Affiliates**



ly represented. Not surprisingly, most aspects of ocular and systemic disease were already being taught at most affiliates. Pediatrics, binocular vision, low vision, advanced/complicated contact lens problems, and objectives pertaining to health care policies were underrepresented. The Clinic Council also recognized that some of the basic didactic coursework that was necessary to support clinical learning in these areas was either minimally covered or missing from the curriculum.

A task force of faculty and clinical administrators was then appointed to develop the details for clinical programming and implementation of the revised clinical curriculum. Over a series of meetings the task force concluded that an advanced care curriculum that was solely clinical would not be able to address all of the learning objectives. The task force considered whether alternative teaching methodologies could be utilized to provide some of the other learning objectives both in clinical and non-clinical settings. Ultimately a decision was reached to deliver the advanced care curriculum objectives (and some of the specialty care objectives) through a combination of traditional and new coursework which would be integrated into the College's existing curriculum. The clinical portion would consist of a new clinical rotation in advanced care (named the Advanced Care Rotation [ACR]). More general clinical experience in pediatrics and binocular vision, low vision, health policy, and advanced experience in contact lenses would be delivered in a newly restructured Specialty Care Rotation. Multimedia technology-based learning activities (some remotely accessed) and a series of pre-graduation "capstone" activities, including a course in laser certification, would complete the delivery of the advanced care curriculum objectives.

## Implementation

Implementation of the advanced care curriculum has required delivery of components to be spread out over the existing third and then final years of the four-year program as follows:

## Third Year Components

- **Primary Care Clinical Education**
  To serve as a foundation, clinical training throughout the third year occurs at NEEI and local inner city primary care and Veterans Affairs affiliated clinics. At selected sites, third year students are assigned along with final year students to broaden their clinical exposure and provide them with more challenging cases.
- **Contact Lens Clinical Education**
  Third year students are also scheduled to a full clinical quarter of primary care contact lens clinic. This assignment is complemented in the final year by a second primary care contact lens rotation, and advanced training in contact lenses (see final year components).
- **Advanced Care Grand Rounds**
  Throughout the entire third year a panel of local and national experts has been assembled to deliver unique components of the advanced care curriculum in a grand rounds case presentation format. These lectures reinforce the objectives in the advanced care curriculum and introduce the student to a variety of actual cases which required the use of advanced diagnostic and treatment procedures. The lectures were also arranged to provide the foundation for the Advanced Clinical Procedures Workshops (see below).
- **Workshops in Advanced Care Procedures**
  To lay a foundation for the clinical component of the ACR, the laboratory/workshop-based course "Advanced Care Procedures Workshops" was created. This course trains students in the diagnostic (and some therapeutic) procedures that will be used while they are at the ACR.
- **"Third Year Capstone Week" Including Laser Certification**
  Advanced care learning objectives are delivered in didactic and case-based formats. Certification coursework is also presented as a capstone experience to third year students after their final examinations (one week prior to commencing the final year). Noteworthy activities in capstone week are a laser certification course which includes a wet lab, transcript quality examination and certification, and didactic coursework in the areas of health policy and risk management.

## Final Year Components

Effective for the class of the year 2000, each student in the final year is assigned to a 12-month clinical program. The final year consists of four 13-week clinical rotations as follows:

## Clinical Rotations Within the Final Year

- **Primary Care Rotation (Table 2)**
  The primary care rotation is delivered at local affiliated inner city neighborhood health centers. The health centers have the advantage of a diverse patient base in multidisciplinary settings. Comprehensive care is provided at these sites. All have extensive therapeutic practices, and some manage pre- and post-operative patient care. Students at health centers are also involved in remote learning and CD-ROM based patient management problems to complement the ACR and Specialty Care learning objectives.

  In academic year 1998 the College implemented a pilot program in telemedicine at three health centers. Sub-specialists at NEEI review and comment on remotely transmitted ocular images and other vision examination data sent from the health centers. Patients, doctors, and students all benefit from this

### Table 2
### Primary Care Rotations

Brighton Marine Health Center
Brighton, Massachusetts

Dimock Community Health Center
Boston, Massachusetts

Dorchester House Multi-Service Center
Dorchester, Massachusetts

East Boston Neighborhood Health Center
East Boston, Massachusetts

Martha Eliot Health Center
Jamaica Plain, Massachusetts

North End Community Health Center
Boston, Massachusetts

South Boston Community Health Center
South Boston, Massachusetts

South End Community Health Center
Boston, Massachusetts

Upham's Corner Health Center
Dorchester, Massachusetts

mode of care. Telemedicine enables patients to benefit from prompt expert comprehensive care that is conveniently rendered. Faculty enjoy immediate feedback on their cases from telemedicine consultation experts that enables them to enhance diagnostic and patient management skills. Students also fully participate in the telemedicine sessions, gaining unique new knowledge and skills. Telemedicine teaches students an innovative mode of practice that emphasizes total care for patients. Telemedicine also provides an opportunity for students to learn from numerous experts. This experience helps to prepare students to effectively enter a wide range of practice settings. (During academic year 1999 telemedicine technology will be installed at the remaining health center affiliates. This final linkage will enable the College to provide telemedicine training to all of its students by academic year 2000.)

- **Contact Lens Rotation**
  Final year students are also assigned a full clinical quarter of primary care contact lens clinic. This service operates at NEEI during weekdays, evenings, and Saturdays. Students are typically scheduled for their contact lens rotation while they are attending one of the Boston based inner city primary care clinics. (Advanced contact lens patients are also seen by final year students as part of the newly created Specialty Care Rotation [see below]).
- **Specialty Care Rotation** (Table 3)
  Using NEEI as a base, students in this clinical rotation are scheduled to rotate periodically throughout a variety of specialty areas including pediatrics and binocular vision, low vision, and advanced contact lenses. Students also participate in computer-based learning exercises in health policy and risk management, and other multi-media activities associated with patient care in the specialty area.

  Students at the Specialty Care Rotation also participate in the consultant end of the telemedicine loop. Telemedicine consultations from the health centers are reviewed by NEEI-based consultants during the students' telemedicine session. The consultants interact with the referring doctor either on-line or engage in teleconferences where management plans are developed for each case. Thus, the Specialty Care Rotation also teaches the student how remote consultations are reviewed and managed on the receiving end, how clinical practice guidelines might be applied to certain cases, and ultimately how clinical management decisions are made by the telemedicine consultants.
- **Advanced Care Rotation** (Table 4)
  Advanced care rotations deliver the newly defined clinical curriculum objectives. To qualify as an advanced care training site, the Clinic Council decided that the practice must be able to provide students with at least 60% of the clinical learning objectives in the ACR curriculum (Table 1). The remaining objectives are delivered through the other teaching modalities described in this section.
- **Elective Rotation** (Table 5)
  The elective rotation is comprised of a broad range of clinical settings delivering primary, secondary, and tertiary care. Students choose rotations from this group to gain further experience in an area of optometric practice that appeals to them. Through an elective rotation students can enrich their clinical experience caring for a more diverse patient base. Included in the elective care affiliates are internationally based affiliates.

## Table 3
## Specialty Care Rotation Activities

**Based from the New England Eye Institute**

Local ACR Clinical Experience

Advanced Contact Lenses

Binocular Vision

Pediatrics

Low Vision

Health Policy

Risk Management

Telemedicine

Interactive Distance Learning

## Table 4
## Advanced Care Rotations

Aran Eye Associates
North Miami Beach, Florida

Bascom Palmer Eye Institute
Miami, Florida

Braverman Eye Center
Hallandale, Florida

Capital Eye Consultants
Fairfax, Virginia

Cataract and Laser Institute
San Antonio, Texas

Seidenberg Protzko Eye Associates
Havre de Grace, Maryland

The Krieger Eye Institute
Sinai Hospital of Baltimore
Baltimore, Maryland

Omni Eye Services of Chattanooga
Chattanooga, Tennessee

Omni Eye Specialists
Baltimore, Maryland

University Of Maryland, Department of Ophthalmology
Baltimore, Maryland

Veterans Affairs Medical Center
Baltimore, Maryland

Veterans Affairs Outpatient Clinic
Boston, Massachusetts

Veterans Affairs Medical Center
Fresno, California

Veterans Affairs Medical Center
Montrose, New York

Veterans Affairs Medical Center
Newington, Connecticut

Veterans Affairs Medical Center
White River Junction, Vermont

Omni Eye Services of New Jersey
Iselin, New Jersey

## Other Components of the Final Year

- **Internet-based remote learning through various websites, CD-ROMs, and other specially designed interactive computer-based learning materials**
  Perhaps the most unique feature of the advanced care curriculum is the development of a multi-media

## Table 5
## Elective Care Rotations

Barnet Dulaney Eye Center
Phoenix, Arizona

Brooke Army Medical Center
San Antonio, Texas

Centro Boston de Optometria Y Oftalmologia
Madrid, Spain

The Eye Foundation Of Utah
Murray, Utah

Groton Naval Hospital
Groton, Connecticut

Indian Health Services
Albuquerque, New Mexico
Santa Fe, New Mexico

Joslin Diabetes Center
Boston, Massachusetts

New England Eye Institute
Boston, Massachusetts

Lahey Clinic Medical Center
Peabody, Massachusetts

Newport Naval Hospital
Newport, Rhode Island

Omni Eye Services of Atlanta
Atlanta, Georgia

Patuxent River Naval Hospital
Patuxent River, Maryland

Portsmouth Naval Hospital
Portsmouth, New Hampshire

Roosevelt Roads Naval Hospital
Ceiba, Puerto Rico

Edith Nourse Rogers Memorial Veterans Hospital
Bedford, Massachusetts

Veterans Affairs Medical Center
Brockton, Massachusetts

Veterans Affairs Medical Center
Lowell, Massachusetts

Veterans Affairs Medical Center
Manchester, New Hampshire

Veterans Affairs Medical Center
Northampton, Massachusetts

Veterans Affairs Medical Center
Portland, Oregon

Veterans Affairs Medical Center
Providence, Rhode Island

Veterans Affairs Medical Center
Eastern Blind Rehabilitation Center
West Haven, Connecticut

Veterans Affairs Medical Center
West Roxbury, Massachusetts

Veterans Affairs Medical Center
Worcester, Massachusetts

Vicenza Clinic
Vicenza, Italy

Vision Institute of Canada
North York, Ontario, Canada

Washington Navy Yard
Washington, DC

Western Massachusetts State HospitalWestfield, Massachusetts

based remote learning curriculum. These curriculum components and materials are designed to reinforce the learning objectives of the advanced care curriculum (including specialty care). Internet websites and CD-ROMs with interactive cases emphasize advanced care principles of diagnosis, treatment, and management. In developing this phase of the curriculum, a working group within the task force first identified commercially available materials (such as CD-ROMs on glaucoma, retinal and corneal problems), and websites dedicated to eye and vision care. During academic year 1999 additional multi-media activities are being developed to support unique aspects of the advanced care curriculum including specialty contact lenses, pediatrics and binocular vision, low vision, and health policy and risk management. Students are required to electronically submit homework assignments as a part of this component of the advanced care curriculum.

- **"Capstone Week"**
  Final emphasis of advanced care learning objectives and certification coursework are presented as a capstone experience to students after their final rotation is completed (one week prior to graduation). Noteworthy activities in capstone week include risk management seminars, training in injectables, and clinical case presentations in disease, pediatrics, and low vision which highlight and tie together the advanced care objectives in each of the sub-categories.

The Division of Clinical Sciences believes that reinforcing and presenting advanced care through the aforementioned teaching modalities results in the greatest retention of information and the broadest clinical experience for students. Furthermore, the introduction to remote learning experiences and telemedicine lays a foundation in technology-based delivery of health care and remotely accessed continuing professional education programs that most practitioners will experience in the 21st century (see future expansion plans).

## Plans for Evaluation and Monitoring

The ACR and other elements of curriculum reform will require detailed monitoring. In academic years 1996 and 1997 the College redesigned its grading system[2], instructor evaluation system, and patient encounter log form so that all faculty and students in all years of the clinical program use the same assessment tools.

These administrative tools (grading system, instructor evaluation system, and patient encounter log) will serve as the foundation for the evaluation and monitoring of the curriculum, and as a barometer of the successful attainment of the learning objectives in the new curriculum.

The College will also be able to draw conclusions on the effectiveness of the ACR objectives and faculty utilization of telemedicine consultations by looking at numerous other variables including:

- Comparing students' National Board scores on the clinical parts before and after implementation of the ACR.
- Comparing clinical evaluations of students at neighborhood health center rotations prior to and after the implementation of telemedicine and the remote learning components of the ACR. This comparison will enable the College to assess the educational impact of the new curriculum on previously established endpoints in clinical education. In particular, the new grading system developed by Bazzinotti et al[2], which clearly defines key clinical behavioral descriptors, will yield a high degree of specificity

in the assessment of student competencies and the new learning objectives.

• Maintaining a log of telemedicine consultations and referrals made by faculty and students from neighborhood health centers for specialty care. The log will enable the center directors and the College to look at the number and effectiveness of referrals made via telemedicine to those made outside of the building (both prior to the availability of telemedicine and during the same time as the telemedicine project). This data should provide information on numbers of referrals, and whether or not the patient kept the outside referral appointment.

• Assessing clinical outcomes of patients with various problems who have benefited from specialty care and telemedicine consultations to measure the effectiveness of telemedicine on the prevention of morbidity and vision loss.

The faculty will need ongoing support during the transition of the curriculum, and opportunities to provide feedback to the administration. Since 1990 the College has sponsored an annual conference for its preceptors.[3] The conference, which is a major faculty development activity, is a regular line item in the budget of the Department of External Clinical Programs. The conference has consistently drawn about 50 faculty from the College's internal and external programs. The 1999 preceptor's conference is dedicated to an assessment of the ACR and further training in the area of telemedicine.

The College will also be undergoing another accreditation visit by the COE in the year 2002. The COE report will serve as an additional assessment of outcomes for the new clinical curriculum and its objectives.

## Future Expansion Plans

The final phase of the advanced care curriculum will be the development and opening of a Clinical Technology Center at NEEI (planned for academic year 2000). The Clinical Technology Center will house a library of digital images, multi-media based clinical materials, and a server to network the telemedicine setups with other College affiliates. The Center will also provide email addresses to all students on rotation and clinical faculty. Post-graduate continuing education coursework with multimedia interactive capabilities will also be featured as a Clinical Technology Center offering. Eventually the Center will provide clinical educational programming and telemedicine linkages with more remote sites, including the College's international affiliates in Europe, Africa, and Asia.

**Table 6**
**Summary of Revised Clinical Curriculum**

**Third Year Components**

Primary Care Clinic
Contact Lens Primary Care Clinic
Advanced Care Grand Rounds
Workshops in Advanced Care Procedures
Third Year Capstone Week (including Laser Certification)

**Final Year Components**

*Clinical rotations*
Primary Care Rotation
- telemedicine

Contact Lens Rotation
Specialty Care Rotation
- clinical sub-specialties
- health policy
- risk management
- telemedicine

Advanced Care Rotation
Elective Care Rotatation

*Other components*
Internet-based distance learning
Capstone Week

## Summary

The New England College of Optometry, through a systematic clinical curriculum analysis, has been able to refine and expand the learning objectives for the final two years so that graduates will be thoroughly prepared to provide comprehensive care to their patients in the 21st century. The new curriculum is organized in a manner that enables the College to add new clinical knowledge and techniques to the program with ease. The use of multi-media based distance learning and telemedicine will prepare graduates for the technological revolution that is just beginning to take hold in health care. (Table 6)

The class of 2000 will be the first to complete the new curriculum. The evaluations that the College receives from faculty and students over the next few years will serve the vital function of providing feedback on the curriculum to help refine the program and its individual elements. Ultimately, the feedback that the College receives from its graduates will provide insight into the success of this ambitious initiative.

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# A Model Curriculum For Teaching Optometry Students about Smoking Cessation Education

Elizabeth Hoppe, O.D., M.P.H.

**Abstract**

*According to the Centers for Disease Control and Prevention (CDC), cigarette smoking is the single most preventable cause of premature death in the United States. Every year, more than 400,000 Americans die from cigarette smoking, contributing to approximately one in every five deaths. Much is known about the systemic health effects of smoking. Smoking has also been linked to many ocular health problems such as age related macular degeneration and cataracts. Over thirty-three million (69.2% of current smokers) want to quit completely. As health care professionals, optometrists have the opportunity to play a key role in assisting their patients through smoking cessation education. Optometrists have already proven to be important partners in educating their patients about other systemic health issues such as diabetes and hypertension. Smoking cessation education can be another way to impact the health of optometric patients. Since 1992, third year students at Southern California College of Optometry (SCCO) have received training in smoking cessation education as a part of the public health curriculum. A model known as the "5 A's" is presented to illustrate methods for smoking cessation intervention appropriate for health care providers. The "5 A's" model presented to the students is clear, concise, and easy to apply. It can be tailored to suit the individual patient and his or her past tobacco use history. Smoking cessation education should be considered as an integral part of optometric clinical education. Preparing optometry students to fill the role of primary care providers requires that they become proficient in all aspects of patient education and health promotion.*

**Key Words:** *Smoking cessation, patient education, primary care, public health, disease prevention, curriculum*

## Introduction

According to the Centers for Disease Control and Prevention (CDC), cigarette smoking is the single most preventable cause of premature death in the United States. Every year, more than 400,000 Americans die from cigarette smoking, contributing to approximately one in every five deaths. Each year, smoking kills more than 276,000 men and 142,000 women.[1] Exposure to second hand smoke (environmental tobacco smoke) causes an estimated 3,000 deaths from lung cancer among American adults.[2]

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The impact of smoking on potential years of productive life is staggering. On average, smokers die nearly seven years earlier than nonsmokers[3], and every year premature deaths from smoking rob more than five million years from the potential life span of those who have died.[1]

Much is known about the systemic health effects of smoking. A man who smokes increases his risk of death from lung cancer by more than 22 times and from bronchitis and emphysema by approximately 10 times. A woman who smokes increases her risk of dying from lung cancer by almost 12 times and the risk of dying from bronchitis and emphysema by more than 10 times. Smoking triples the risk of dying from heart disease among men and women in the middle age ranges.[1]

Smoking has also been linked to many ocular health problems. Table 1 lists examples from the literature. Some are relatively minor, for example external eye irritation, yet others are more serious, such as age related macular degeneration and cataract. In one study it was found that current smokers were almost four times as likely to have age-related macular degeneration, including neovascular AMD and geographic atrophy.[6]

Despite all that is known about the health effects of tobacco, many Americans continue to smoke. In 1994 the prevalence of cigarette smoking among adults 18 years and older was 25.5%, or 48 million people[7]. If current smoking patterns continue, an estimated 25 million people living in the U.S. today will die prematurely from smoking-related illnesses, including an estimated five million persons 0-17 years of age.[1]

The good news is that 33.2 million (69.2% of current smokers) want to

**Table 1**
**Eye Health Problems Associated with Smoking**

| |
|---|
| Age Related Macular Degeneration[22,23,4] |
| Cataract[24, 25] |
| Strabismus (when mother smokes during pregnancy)[26, 27] |
| Grave's Ophthalmopathy[28] |
| Anterior Ischemic Optic Neuropathy[29] |
| Tobacco Amblyopia[30] |
| Impaired Night Vision[31] |
| Reduction in Size of the Total Visual Field[28] |
| Blindness as a Result of Stroke[28] |
| External Eye Irritation[28] |

quit completely.[5] As health care professionals, optometrists have the opportunity to play a key role in assisting their patients through smoking cessation education.

## The Role of Health Care Providers in Smoking Cessation

The professions of medicine[9,10], nursing[11] and dentistry[12,13,14] are already involved in educating their patients about smoking cessation. Physician-delivered smoking interventions including advice only, counseling, and counseling plus availability of nicotine gum have all proven effective in producing both short term and long term smoking cessation.[7] Recent research has even shown that patients who receive or were offered smoking cessation counseling were more satisfied with their medical care than those who did not.[15]

Public health professionals have recognized the important role that health care providers can play in smoking cessation. It is estimated that if only half of all U.S. health care providers successfully counseled only 10% of their patients who smoke, there would be two million new nonsmokers in the United States each year[16]. In the document "Healthy People 2000", goal 3.16 reads:

> Increase to at least 75 percent the proportion of primary care and oral health providers who routinely advise cessation and provide assistance and follow-up for all of their tobacco-using patients. (Baseline: About 52 percent of internists reported counseling more than 75 percent of their smoking patients about smoking cessation in 1986; about 35 percent of dentists reported counseling at least 75 percent of their smoking patients about smoking in 1986).[17]

As primary care providers, optometrists can help the nation reach this goal.

"Public health optometry" has been defined as the use of the full scope of optometric knowledge, skills, and services to prevent disease, prolong life, and to promote health and the efficiency of people, particularly at the community level.[18] Smoking cessation education is certainly an activity that fits this description.

Smoking cessation education can be considered as both primary level optometric preventive care:

> setting the stage to prevent the onset of vision conditions so that they will not be detrimental to the full development or utilization of the patient's potential and that visual performance be raised and enhanced to optimum levels;

and secondary level optometric preventive care:

> preventing or reversing ongoing vision deterioration, so that any interference with the patient's potential would be reversed and visual performance raised above minimum levels.[19]

Optometrists have already proven to be important partners in educating their patients about other systemic health issues such as diabetes and hypertension. Smoking cessation education can be another way to affect the health of optometric patients.

## Smoking Cessation Education at SCCO

Since 1992 third year students at Southern California College of Optometry (SCCO) have received training in smoking cessation educa-

**Figure 1**
**Example of "quit for good Rx"**

QUIT FOR GOOD Rx

I agree to stop smoking on _____
*Date*

I understand that stopping smoking is the single best thing I can do for my health and that my health professional has strongly encouraged me to quit.

_____ _____
*Patient's Signature* *Professional's Signature*

_____
*Today's Date*

County of Orange TUPP TOBACCO USE PREVENTION PROGRAM (714) 541-1444

**Figure 2**
**[excerpt from "Smoke Gets In Your Eyes][28]**

### Smoking Can Affect Vision

Vision is one of man's most precious possessions and should be protected. But, smoking tobacco introduces foreign materials into the body's natural balance and can affect vision. Night vision can be impaired and tobacco smoke can be irritating to the eyelids. With each cigarette smoked, the potential danger exists that the eyes will not continue their normal efficient operation. Recent health care research has shown that because of the harmful gases present in cigarette smoke, excessive smoking might produce limitations on total visual ability. An example is the sharp vision needed to operate a motor vehicle at night. And, of course, there is eye irritation and discomfort that can occur when smoke from a burning tobacco product accidentally drifts directly into a person's eyes. This is particularly true if the person is a nonsmoker or is afflicted with allergies.

## Table 2
## Five A's

| Steps | Activities | Examples |
|---|---|---|
| Anticipate | If patient already smokes, anticipate readiness to quit. If patient is a nonsmoker, anticipate patient's exposure to environmental tobacco, tobacco smoke based on family smoke, risk for initiating smoking behavior, and stressful events that may trigger patient to start using tobacco. | • Assess risk factors for smoking relative to age, gender and ethnicity<br>• Assess risk factors for environmental history, occupation and leisure activities |
| Ask | Ask about tobacco use and exposure to environmental tobacco smoke. Ask about frequency of tobacco use. Tag chart and note information in patient history | • Do you smoke/use tobacco?<br>• How much?<br>• How soon after waking do you have your first cigarette?<br>• Do you want to stop?<br>• Have you tried to quit before? |
| Advise | Advise all smokers to stop. Show tobacco's adverse health effects if present. Personalize the cessation message. Advise clearly the necessity of stopping now. Commend non-users. | • Give brochure on health effects<br>• Show caring and concern<br>• Educate passive smokers about hazards of secondhand smoke |
| Assist | Assist the patient in stopping. Help the patient set a quit date. Provide self-help materials or refer to a smoking cessation support group. Consider recommending nicotine replacement for strongly addicted patients. | • What date do you want to stop smoking?<br>• Do you think you will need something to help reduce any cravings you might experience?<br>• Provide motivational literature to the patient who is not ready to stop |
| Arrange Follow Up | Have office staff make a 1-week follow up call or send a letter to confirm the quit date. Do additional follow up 1-2 weeks and 1-2 months after the quit date. | • Congratulations on setting a quit date!<br>• Address patient concerns regarding weight gain, withdrawal symptoms, nicotine replacement<br>• Ask uninterested patients again at their next regular visit if they have reconsidered their decision |

tion as a part of the public health curriculum. Each year health educators provide a lecture from the Tobacco Use Prevention Program (TUPP), a department within the Orange County California, Health Care Agency. The TUPP program is funded by state tax dollars generated by a 25 cent per pack cigarette sales tax levied in 1988 as Proposition 99.

From 1992 through 1996 the educational program at SCCO consisted of one hour; in 1997 the program was expanded to two hours. The lecture provides background information on smoking-related deaths in the United States, cancers and other illnesses attributed to smoking, and specific information on eye health problems associated with smoking. Reasons why people smoke, the addictive process, and the difficulties many people encounter with quitting are also covered. A model known as the "5 A's" is presented to illustrate methods for smoking cessation intervention appropriate for health care providers.

The students also receive a handout packet including patient education brochures, fact sheets, and a "quit for good Rx" prescription pad (see Figures 1 and 2). In 1996 and 1997 the course also included videotaped vignettes illustrating role playing for different types of patients that might be encountered in a medical or optometric setting.

The "5 A's" model presented to the students is clear, concise, and easy to apply. It can be tailored to suit the individual patient and his or her past tobacco use history. Table 2 illustrates the basic steps.

A precursor to adopting the model involves making optometry students aware of the role they can play in smoking cessation intervention and encouraging them to put it into practice. Once the student is thinking about smoking cessation intervention then he or she can incorporate these steps for current smokers and for nonsmokers.

The first step presented is to "anticipate." For current smokers, optometric students are encouraged to anticipate the patient's readiness to quit. Factors such as age, length of smoking behavior, health status, and level of addiction can help gauge how receptive a patient might be to hearing a smoking cessation message. Awareness of these factors can help to personalize appropriate patient education.

Special populations with high smoking rates or with the potential for higher rates of complications from smoking (for example pregnant women or women who use oral contraceptives) have been identified by the U.S. Public Health Service (see Table 3). Familiarity with these target groups and the associated smoking rates can help optometry students focus on

## Table 3
## Special Populations Targeted for Smoking Cessation14

| Target Population | 1987 Baseline Rate | 2000 Target Rate |
|---|---|---|
| People with a high school education or less aged 20 and older | 34% | 20% |
| Blue-collar workers aged 20 and older | 36% | 20% |
| Military personnel | 42% | 20% |
| African Americans aged 20 and older | 34% | 18% |
| Hispanics aged 20 and older | 33% | 18% |
| American Indians/Alaskan Natives | 42 - 70% varies by tribe | 20% |
| Southeast Asian men | 55% | 20% |
| Women of reproductive age | 29% | 12% |
| Pregnant women | 25% | 10% |
| Woman who use oral contraceptives | 36% | 10% |
| Lower socioeconomic youth | 40% | 18% |
| American Indian/Alaskan Native youth who use smokeless tobacco | 18 - 64% varies by tribe | 10% |

patients who may especially benefit from a smoking cessation message. Identification of the target groups shown in Table 3 is particularly relevant for the third year students who are about to enter the fourth year outreach clinical programs. These students will be providing patient care at military bases, within the Indian Health Service[20], and at an inner city Los Angeles clinic that has a high percentage of Hispanic patients.

Many of the interventions for nonsmokers are targeted to young people before they start smoking. Optometrists who provide care for pediatric patients and teens can serve as role models to keep them from starting smoking. Knowledge of the process for starting smoking can help optometrists influence the potential smoking behavior.

Health education professionals have identified three stages in the smoking process. The first stage is experimentation. It has been reported that 70% of children experiment with smoking, 40% while they are still in elementary school. Experimentation with cigarettes and chewing or "spit" tobacco can begin as early as age 5, with an average age of first tobacco use at 14. The second stage is described as occasional use. Examples of occasional use would be smoking on weekends, at parties, or on dates. This often occurs in the teen years. The final stage in adopting smoking behavior is addiction. At this point, the individual is now a confirmed, regular smoker. It is estimated that virtually all smokers are addicted while still in their teens.[18] Risk factors that have been associated with a greater likelihood of using tobacco include children whose parents or siblings smoke, poor academic performance, and living with a single parent.[18]

Optometrists can also advise the parents of their patients about prevention of tobacco use and the effects of environmental tobacco smoke. Children who live with smokers are more likely to smoke themselves. Additionally, they suffer more from asthma, allergies, respiratory problems, and ear infections.[18]

The second step presented in the curriculum model is to "ask." Optometry students are encouraged to ask their patients about their smoking behavior and exposure to environmental tobacco smoke as a part of their routine patient history. The information should always be documented in the patient's chart to track at future visits. In large practice settings, stickers or stamps can be used to document the information uniformly. Questions about smoking and exposure to environmental tobacco smoke can also be included in history forms to be filled out by the patient.

For patients who have quit smoking, it is important to realize that relapses are common. Ask at each visit if the patient is still a nonsmoker. For those patients who do not smoke and for those who have successfully quit, give positive reinforcement and congratulate them on their healthy life styles.[18]

The third step in the model is to "advise" all smokers to stop. An example might be to say, "As your health care provider (or eye care provider if the student feels more comfortable with this phrase) I must advise you for your health to stop smoking now." (Optometry students are encouraged to personalize the risks of smoking and the benefits of stopping to fit the patient's health, lifestyle, family history, personal interests, and social roles.) If tobacco related health effects are present (for

## Table 4
## Examples of Behavioral Objectives

1. Memorize some simple facts and figures to discuss during smoking cessation intervention to include:
   a. annual number of smoking related deaths
   b. examples of smoking related systemic and ocular health complications
   c. the yearly cost of smoking a pack of cigarettes per day

2. Memorize the 5-A's and be able to give examples for each step.

3. Be able to identify special target populations at high risk for smoking and smoking-related health complications.

4. Identify ways you can include smoking cessation education in your clinical practice.

## Table 5
## Tobacco Related Resources

| | |
|---|---|
| American Academy of Family Physicians<br>AAFP Stop Smoking Kits<br>Health Education Department<br>PO Box 8723<br>Kansas City, MO 64114-0723<br>(816) 333-9700 | Stop smoking kit includes waiting room and patient materials, physician and staff manuals, charting materials, and signs |
| American Cancer Society<br>local offices | Brochures, smoking cessation classes and materials, educational materials, information for speakers |
| American Heart Association<br>local offices | Brochures and educational materials emphasizing heart disease |
| American Lung Association<br>local offices | Brochures and educational materials emphasizing lung disease |
| American Medical Association<br>Division of Communications<br>515 N. State St.<br>Chicago, IL 60610<br>(312) 464-5000 | "Creating a Tobacco Free Society: A Physician Leadership Kit" information on smoke free hospitals, school education and legislation |
| National Cancer Institute<br>Office of Cancer Communication<br>Building 31, Room 10 A 24<br>Bethesda, MD 20892<br>1-800-4-CANCER | "Clinical Opportunities for Smoking Intervention — A Guide for the Busy Physician," brochures, quit for good pamphlets |

example, high blood pressure, eye irritation, cataracts, or macular changes) the patient should be advised that stopping smoking may reverse or prevent these conditions from worsening. The effects of environmental tobacco smoke on others may also be discussed, particularly for those patients who are parents.[18]

The fourth step in the model is to "assist" the patient in stopping. For those patients who would like to quit, the optometrist can play a significant supportive role. One example is to help the patient set a specific quit date. Identification of a specific date can help patients prepare to stop, both psychologically and by removing items such as cigarettes and ashtrays from their environment. A suggested time frame is two to four weeks. Sometimes it is helpful to pick a date that is significant such as a birthday or anniversary.

Self-help materials or a referral to a smoking cessation support group are other ways to assist a patient. Nicotine replacement therapy may be beneficial for those smokers who are heavily addicted. Heavily addicted smokers are described as those smokers who smoke more than a pack a day and/or have a cigarette within 30 minutes of waking in the morning. Nicotine gum and nicotine patches are now available without prescription so optometrists may make a referral to the local pharmacy.[18]

The final step in the curriculum is to "arrange follow up." Following up with a patient reinforces the optometrist's care and concern for the patient's well-being and provides the additional support that may increase success rates in quitting. The follow-up may take the form of a phone call, a post card, or a letter. Many patients will have concerns about weight gain or withdrawal symptoms so a follow-up message might provide additional information about these issues. Many patients will not stop smoking the first, second, or even third time they are counseled to do so, so it is important to include smoking cessation education as a routine activity for every visit.[18]

Some examples of specific behavioral objectives appropriate for the adoption of this smoking cessation education curriculum are shown in Table 4. Successful mastery of these behavioral objectives will provide optometry students with the tools they need to include smoking cessation education as a part of clinical patient care.

Smoking cessation education should be considered as an integral part of optometric clinical education. Preparing optometry students to fill the role of primary care providers requires that they become proficient in all aspects of patient education and health promotion. Smoking cessation education is a good example of how optometrists can make a big impact on the health of their patients.

Optometric educators who teach in the areas of public health, ocular disease, systemic health, general medicine, and primary care clinical services can incorporate elements of this curriculum into the lecture, laboratory, and clinic settings. Many local

health departments have resources available to provide further information for both faculty members and students. National organizations and agencies that can provide educational materials and services are listed in Table 5.

## Acknowledgments

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## Guest Editorial

*(Continued from page 5)*

colleges of optometry. If we follow the competitive model of the past, some schools will find they have a surplus of externships, zealously guarded as a resource, while other schools will find they have an unmet need for student placements.

We must begin to work together to establish a national clearing house and placement service for externships in optometry. Through such a clearinghouse all institutions of optometric education will fully share in this enormous national resource, and each site will be appropriately and fully utilized. The clearinghouse could facilitate the development and implementation of national standards for externships, possibly leading to some form of accreditation for participating sites.

Our purpose, after all, is not to compete with one another, but to cooperate in the advancement of optometric education and the profession. By so doing we not only assure an efficient and effective use of the opportunity that is being presented to us, but we also best serve the needs of our students, the affiliated facilities, and the patients they treat.

I realize this will not happen over night. It will require much discussion and a decision to accept challenges and make compromises. It will require a recognition of the fact that the traditional environments in which we have lived will not be the models for tomorrow. It will require change. It will not be easy. It will be necessary.

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# Functional Standards For Didactic and Clinical Optometric Education

*At its June 1998 meeting, ASCO's Board adopted the following standards recommended by its Task Force on Functional Standards for Didactic and Clinical Optometric Education. Members of the task force were Drs. Ed Johnston, SUNY, chair; Nancy Carlson, NEWENCO; Tom Colladay, MCO; Sue Cotter, SCCO; Judith DuChateau, AOA; Adam Gordon, UAB; Jeffrey Nyman, PCO; and Les Caplan, consultant to ASCO.*

Though the impetus for developing these standards was the 1990 Americans with Disability Act (ADA), in reality the need long existed for guidelines to be established that would pertain to all who apply to or are enrolled in Doctor of Optometry programs. Those in our institutions who are responsible for the recruitment and admission of potential candidates have requested these standards for counseling undergraduates, who not only question what academic background is required, but also, what other qualifications are needed. Likewise, faculty should find these guidelines useful as they set standards to assess their students' preparedness to provide comprehensive optometric care. Equally important is the need for undergraduates to have guidelines that can help them assess whether the attributes and skills that they have developed over the years are compatible with those of today's health practitioner.

The five broad functional areas that are identified highlight the importance that a healing profession should place on such things as a practitioner's ability to accurately observe, to effectively communicate, to possess good sensory and motor coordination, to analyze and integrate material, and to possess certain acceptable behavioral and social attributes. These functions contribute to one's ability to achieve both academically and professionally. Each function can stand alone as a basis for determining a candidate's readiness for practice.

Candidates for admission to a school or college of optometry should also be made aware of these standards before they commit themselves to a rigorous four-year curriculum, in order to determine their ability to meet these standards. It is ASCO's strong recommendation that each of its member institutions consider adopting these or similar standards and that the standards adopted be published for candidates and faculty to use in their respective decision making.

One of the missions of each school and college of optometry is to produce graduates fully qualified to provide quality comprehensive eye care services to the public. To fulfill this mission, each institution must ensure that students demonstrate satisfactory knowledge and skills in the provision of optometric care. Admission committees, therefore, consider a candidate's capacity to **function** effectively in both 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** for 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 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, patient interaction and 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 health care 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 health care 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 skills 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 inherent in patient care
- positive acceptance of suggestions and constructive criticism

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.

## Acknowledgment

The five functional areas laid out in this document follow an outline used by many health professional schools. This layout was recommended by the Association of American Medical Colleges in its 1991-92 document on admission requirements.

# Teaching Research Ethics

D. Leonard Werner, O.D.

## Teaching Research Ethics

The creation of a model ethics curriculum — the *Recommended Curriculum for the Teaching of Professionalism and Ethics in Optometry* — provided a structure to the teaching of ethics within the professional programs in optometry. But many of the optometric programs have another constituency, graduate vision science students and researchers, who may also need an ethics education. This group requires a course that is research specific and differs in topics and emphasis from the professional ethics curriculum. It is not simply the substitution of "subject" for "patient" in the guidelines for appropriate behavior. In addition there are federal rules and regulations that are unique to research that do not apply in patient care settings.

The ethical issues in research have been subject to an ever-increasing literature both in scientific and lay circles. Media exposure of inappropriate behavior has damaged the public's respect for the scientific and the educational community. We have been exposed to horrible examples of abusive science such as the Tuskegee Study, atomic energy testing, the often repeated stories of concentration camp medical research, the non-disclosure of adverse effects of their products by major corporations, and whistle-blowing affecting prominent scientists. As frequent as these appear, it is a safe assumption that misconduct occurs more frequently than is exposed.

The standards for research scientists are clear. In the Preface of "On Being A Scientist" it states that, "the scientific research enterprise is built on a foundation of trust. Scientists trust that the results reported by others are valid. Society trusts that the results of research reflect an honest attempt by scientists to describe the world accurately and without bias. The level of trust that has characterized science and its relationship with society has contributed to a period of unparalled scientific productivity. But this trust will endure only if the scientific community devotes itself to exemplifying and transmitting the values associated with ethical scientific conduct."[1]

The results of scientific exploration in vision science go beyond the needs of the scientific community. The eyecare professions and the patients they serve are impacted by the scientific discoveries. Unethical behaviors by vision science researchers not only cast disrepute upon science, but may result in poor clinical decision-making on the part of eyecare practitioners with direct implications affecting patients. Thus the scientific and medical professional communities are tainted by unethical research, although sometimes in different ways.

An added, yet important, influence necessitating a research ethics program comes from the National Institute of Health's requirement that grant applicants attest to have taken a course in ethics.

These issues resulted in the creation of a required course for vision science graduate students at the College of Optometry of the State University of New York. We have presented this course for two years and feel that additional input from the optometric educational community would be helpful. We are in somewhat the same position as existed previously with the teaching of undergraduate ethics. It is time for community sharing of ideas and knowledge. Our one-credit course is given during the summer quarter with shared faculty responsibility of Dr. Jerome Feldman, vice-president for graduate studies, and Dr. D. Leonard Werner.

The student and faculty evaluations of the course have been very positive.

## Reference

1. On being a scientist. Published by the Committee on Science, Engineering, and Public Policy, National Academy Press, National Academy of Sciences, Washington D.C. 1995.

The Association of American Medical Colleges recently published *Developing A Code of Ethics in Research: A Guide for Scientific Societies*. The Guide is focused on research activity and is organized to follow the steps of a scientific investigation. Topics presented for consideration in society codes include: Creating a Positive Research Environment, Applying for Research Support, Conducting Research, Reporting Research and Avoiding and Correcting Violations of Good Conduct. The Guide is available for $25 each plus $5.00 shipping and handling.

Contact:
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## Table 1
## Ethical Issues in Research — A Curriculum

**Responsible Conduct of Research**
A 10-hour seminar course for graduate students. Faculty may audit course as space and schedule allows.

Faculty: Drs. Werner and Feldman. Others may be invited to present their specific expertise.

Course Objectives:

Upon completion of this course students will demonstrate heightened sensitivity to the code of ethical conduct required in biomedical research. They will be introduced to ethical theory and will be familiar with the skills necessary in resolving the ethical dilemmas they may face in the performance of their research activities and graduate studies. These skills will be useful when designing and reporting their research projects or reviewing the research of others.

Process:

Using lectures, video-tapes, and discussion groups students learn about research ethics. There is an emphasis on the institutional guidelines concerning research, particularly the role and protocols of the Institutional Review Board (IRB). Case studies are presented for class discussion to help in solving ethical dilemmas.

I. Introduction:

A. Why teach research ethics?
B. Introduction to the specifics of the course
C. Topics discussed will include:

*cheating, dishonesty, and whistle-blowing
* proprietorship of research information and data
*authorship, second and third authors
* plagiarism
* informed consent
* conflict of interest
* "massaging" data
* retrospective studies
* bias in research design
* institutional responsibility towards ongoing research (monitoring)

II. Research Ethics

A. Lecture and video-tapes discussing research ethics
B. Introduction to the I.R.B., its importance, responsibilities, and function (Presented by the Chair of the Institutional Review Board)

III. Case Study Seminars

A. Individual cases are presented by the faculty for class discussion with emphasis of the ethical issues involved and ethical decision-making.
B. During the final class students present cases they have written and lead the class in the ethical resolution of the dilemmas identified within the case.

IV. Assessment

Student Assessment: The course is graded on a pass/fail basis. Students are required to submit their written case study for the last session and facilitate the class discussion concerning the case. This paper should briefly discuss the ethical implications and possible solutions.

The student grade is based upon student class participation with particular emphasis on their written case study.

Course Assessment: Students evaluate the course using the same forms as with all graduate seminars at our college.

Resources:

1. Penslar R. Research ethics. Bloomington: Indiana Univ. Press, 1995.
2. Korenman SG and Shipp AC. Teaching the responsible conduct of research through a case study approach, published by the Association of American Medical Colleges, Washington, D.C., 1994.
3. Bebeau MJ, et al. Moral reasoning in scientific research. Cases for teaching and assessment. Poynter Center for the Study of Ethics and American Institutions, Bloomington, IN: Indiana University, 1995.
4. Protecting human subjects. Video-tape from the National Institutes of Health, Rockville, MD, June 1993.

# IN REVIEW

**The Eye in Contact Lens Wear.** J.R. Larke, Second Edition, Woburn: Butterworth-Heinemann, 1997, 224pp. $90.00.

Thirty years ago the author became interested in the response of the eye to contact lenses. This book uses that theme as its focus. The second edition has added three new chapters by acknowledged experts in those fields.

There are ten chapters beginning with the anatomy of the eyelids which also covers some clinical problems resulting from incomplete closure and inadequate blinking. The chapter on the conjunctiva concentrates mainly on the palpebral conjunctiva and Contact Lens Associated Papillary Conjunctivitis (CLAPC). The next chapter on tears deals more with the biochemistry and physiology of the tear film and is not very clinically oriented. The fourth chapter on lens deposition and spoilation is a new one, just great and the largest with a liberal supply of color plates (about 50). The chapter on the anterior limbus is brief and deals mainly with neovascularization. The sixth chapter is a very technical discussion of the physiology involved in corneal thickness/hydration and is one of the enhancements to this second edition. The next chapter on the epithelium and contact lens wear touches briefly on a variety of adverse responses of the epithelial layer, e.g., erosions, infiltrates and cystic formations. Corneal touch thresholds, their measurement and interpretation are presented in chapter 8. Chapter 9 is a rather substantial one that is entitled Corneal Swelling and its Clinicala Sequelae. This is a more clinically oriented presentation of the effects of hypoxia from hard or soft lens wear. Brief discussion is given to the effects on corneal shape, refractive state, and visual function. The last chapter is also a new one and covers contact lens associated infections and related conditions.

In summary, this is a very scholarly technical presentation on a variety of important subjects. The print, graphs, charts and tables are typical of scientific publications. Although it has valuable information, it is somewhat haphazardly organized. The references at the end of each chapter are current and adequate in number. Although I couldn't recommend it to the busy clinician who wants a chair-side reference, I will recommend it as a text to have on hand in my library and to my students and all others with a serious scientistic bent.

**Reviewer:** Dr. Lester Janoff
Nova Southeastern University
Health Professions Division
College of Optometry

**Manual of Contact Lens Prescribing and Fitting.** Milton M. Hom, Woburn: Butterworth-Heinemann, 1997, 432 pp., $45.00.

As the author notes, this manual is meant to be a chair-side practical book. Its outline form is designed to make the information easy to look up. The book is divided into five parts, each with a variety of chapters. The printing is good and bolding of important words is well done and helps the reader searching for a specific concept. The diagrams are excellent, especially the three dimensional views of fluorescein patterns even though done in black and white. The ocular photographs which are presented in black and white are adequate but would have been better in color. Clearly this would have increased the cost dramatically. There are seven color plates of fluorescein patterns and four of corneal topography maps which are sharp and clear. The author uses a technique of occasionally stating important points at the end of a paragraph. These are designated "pearls" and it seems to be a more common technique these days. Product names are used extensively throughout the book. That is good from a practical clinical point of view although numerous products will quickly become obsolete. However, the author has overcome most of this difficulty, as a example, by categorizing care system components by their general function and active ingredient(s).

The first part of the book is devoted to basic concepts. The chapter on anterior segment disease is an excellent encyclopedic brief commentary. The second part of the book is devoted to rigid lenses and is a large portion of the book. It covers everything from design to lens care. The only area I felt might be better organized is the fitting philosophies which consists of a variety of primarily practitioner-named philosophies (Korb, Bennett, Bayshore, etc.). This might better have been classified under a principle that related to the true philosophy (modified contour, interpalpebral, etc.). soft contact lenses are covered in the third part of the book in a thorough manner.

Although there are some areas that might be improved, they are few. This is a book that has clearly met its objectives; it is definitely practical and clinical and would make a superb chair-side reference. I would recommend that practitioners seriously consider using the book and will have no problem recommending it to my own students.

**Reviewer:** Dr. Lester Janoff
Nova Southeastern University
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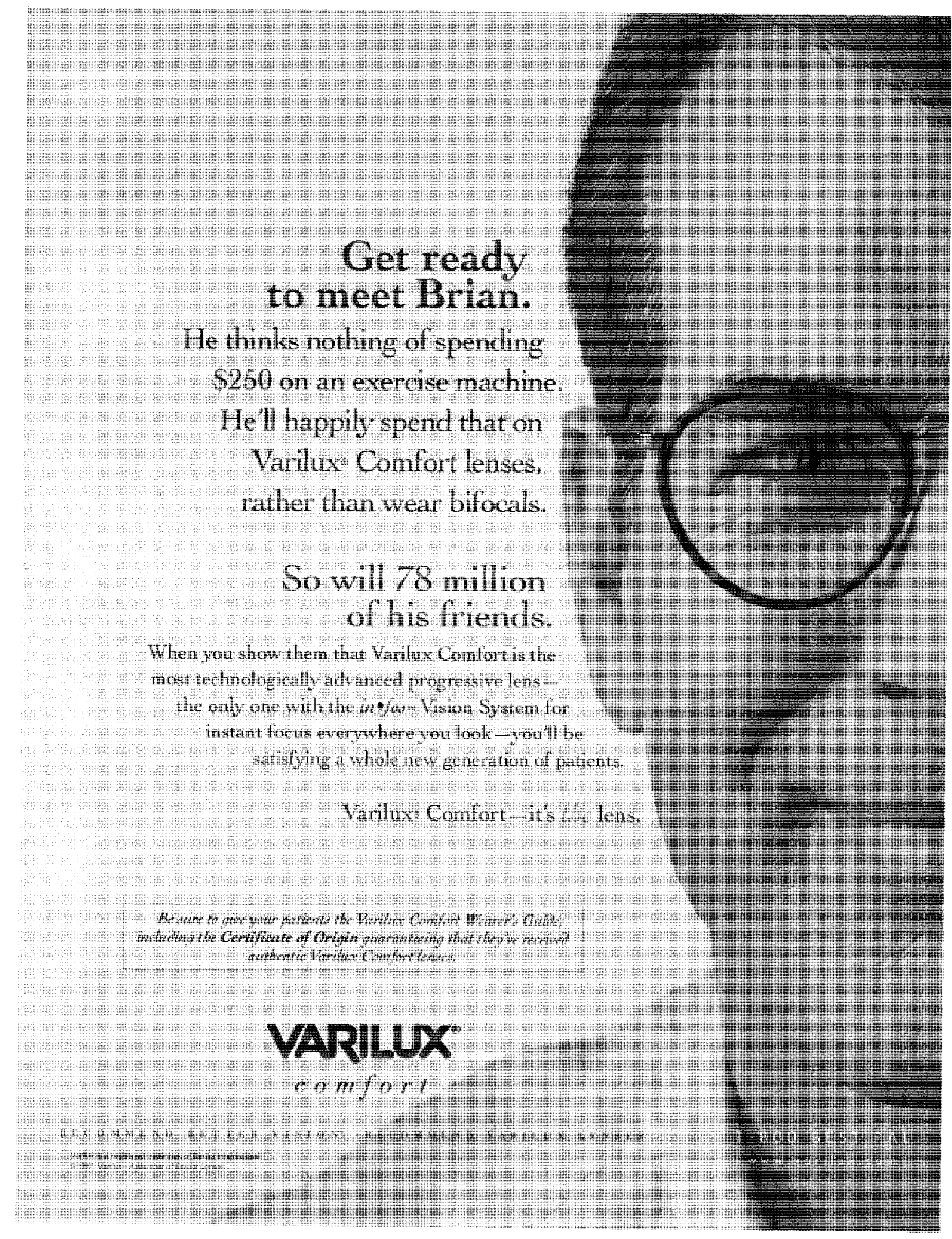

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