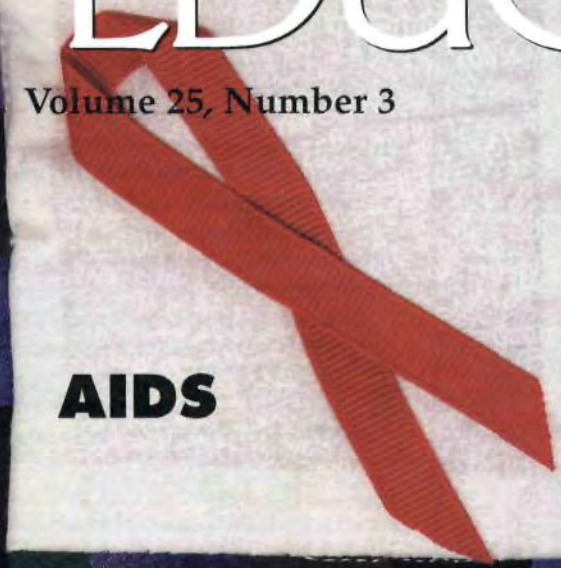
The Journal of the Association of Schools and Colleges of Optometry

OPTOMETRIC EDUCATION

Volume 25, Number 3 Spring 2000



The Role of the Optometric Curriculum

UNIVERSAL PRECAUTIONS

Association of Schools and Colleges of Optometry

The Association of Schools and Colleges of Optometry (ASCO) represents the professional programs of optometric education in the United States. ASCO is a non-profit, tax-exempt professional educational association with national headquarters in Rockville, MD.

OPTOMETRIC EDUCATION

ISSN 0098-6917

VOL. 25
NO. 3

CONTENTS

SPRING
2000

The Journal of the Association of Schools and Colleges of Optometry

DEPARTMENTS

Cover: Carol Nansel, Nighthawk Communications

MEMBER

OPTOMETRIC EDUCATION is published by the Association of Schools and Colleges of Optometry (ASCO). **Managing Editor:** Patricia Coe O'Rourke. **Art Director:** Carol Nansel, Nighthawk Communications. Business and editorial offices are located at 6110 Executive Boulevard, Suite 510, Rockville, MD 20852 (301) 231-5944. The ASCO website is www.opted.org **Subscriptions:** JOE is published quarterly and distributed at no charge to dues-paying members of ASCO. Individual subscriptions are available at $20.00 per year, $30.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Rockville, MD.
 Indexed in Current Index to Journals in Education (ERIC).

EDITORIAL

Clinical Education: When to Begin

Roger Wilson, O.D.

The Health Professions Division of Nova Southeastern University is comprised of the colleges of allied health, dentistry, optometry, osteopathic medicine, and pharmacy. In the College of Osteopathic Medicine there is a course called Interdisciplinary Generalist Curriculum (IGC), which is a required course for first and second year medical students. It is primarily a physician mentor program whereby medical students are assigned to observe a private practitioner beginning in the fall semester of their first year and continuing to the end of the second year. The goals of the IGC (directly from their worldwide web page)[1] include:

- "To develop students' interest in primary care through exposure to positive physician mentors who are practicing General Internal Medicine, Family Medicine, or General Pediatrics.
- To educate students about managed care and the opportunities available to primary care physicians through managed care organizations.
- To enhance the overall learning in the first two years of medical school by simultaneously providing a clinical education along with traditional classroom and small group education."

The IGC enables medical students to learn how physicians engage in the critical thinking and problem-solving processes of patient care from the very beginning of their medical education. In addition to providing a broad exposure to the role of a primary care physician, the IGC enables medical students to learn how to organize, integrate and interpret information (*e.g.* the case history, physical examination, and the ordering of diagnostic and laboratory tests) into definitive medical diagnoses and treatment plans. The physician mentor often stays linked to the same student for the entire first two years, thereby creating a professional mentoring bond.

The IGC is now in its fifth year. The course is universally held in high regard by students and faculty from the medical school, and local practitioners have a deep commitment to "their" students. What I found interesting about this curriculum initiative is that no one at the medical school was particularly concerned about "preparing" the students for this course. Most medical students enter the program without a medical vocabulary, no ability to take a case history, not a clue about a physical examination, and no understanding of the array of diagnostic and laboratory technologies available to their physician mentor. Nevertheless, they learned by listening, observing, taking notes, asking questions, reading, discussing cases with their mentor and classmates, and applying this information to their developing knowledge base of osteopathic medicine.

Nova Southeastern University College of Osteopathic Medicine is not alone in its approach to early clinical education. Both Columbia University College of Medicine and Eastern Virginia Medical School have found that early exposure to clinical experience has benefited their students.

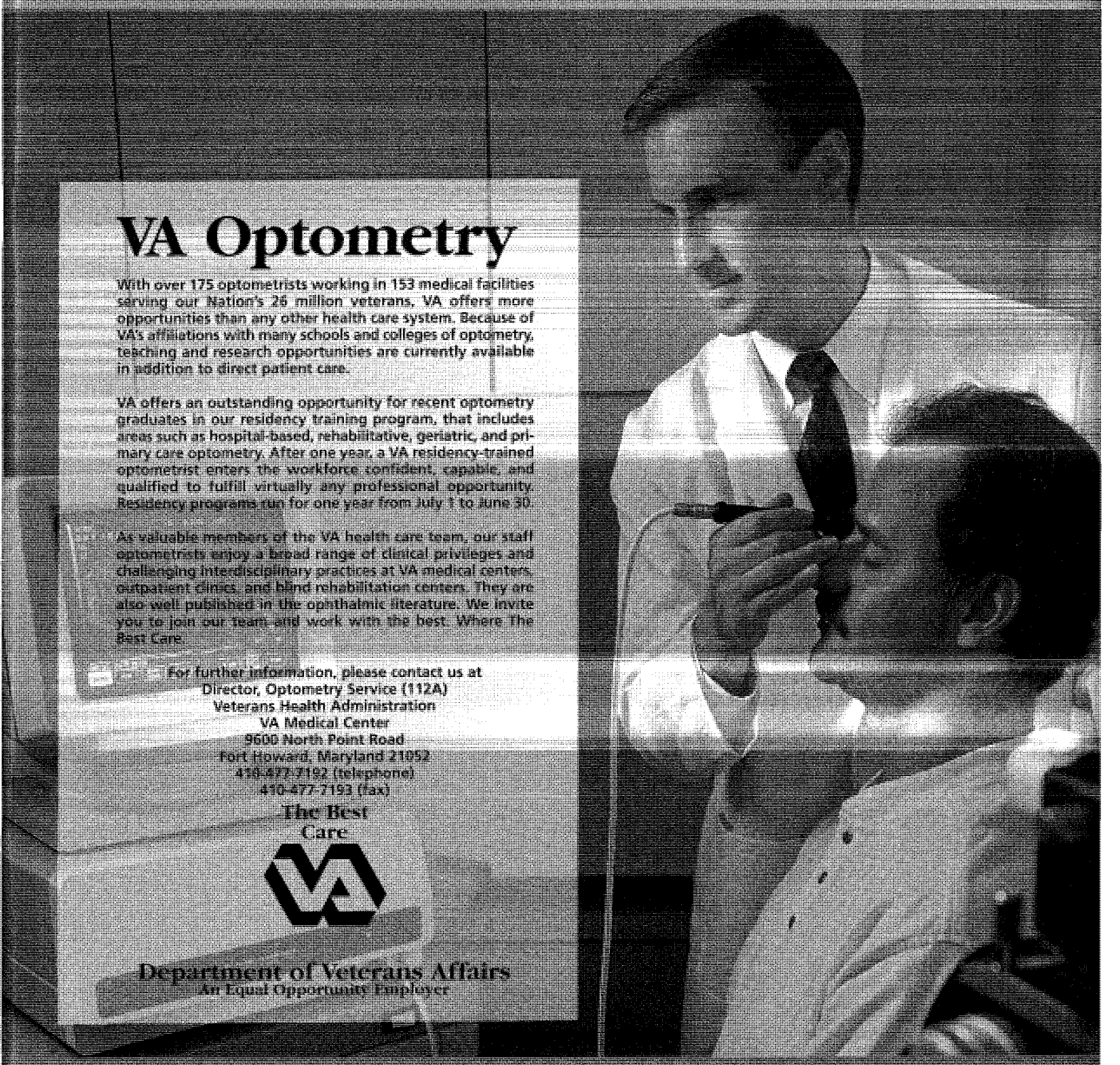
Students at Columbia University College of Medicine felt that the early clinical experience enabled them to understand patients' chief complaints more thoroughly by learning how to listen to a patient. The experience also helped students to understand the clinical relevance of the basic sciences.[2] Eastern Virginia Medical School found that third year medical students who had early clinical exposure to pediatrics had improved clinical scores during their clerkships.[3]

I have long felt that we teach optometry students backwards. We mystify the profession by starting them off with a set of intimidating, complicated courses comprised of theory, and then we assign them to single procedure laboratories which may take two or three sessions to complete. We do a superb job of fragmenting their education and the optometric examination, and then wonder why it takes our students so long to examine a patient. We have difficulty figuring out how to teach our students to create a seamless efficient flow to their optometric examination, and to get them to think about their clinical findings during the examination so that clinical problems are proactively identified and properly addressed.

As I approach my twentieth year in clinical education, I can think of numerous conversations with friends, family, and other lay people who have asked me questions about optometry, vision, eyes, and disorders and diseases of the eye and visual system. I try to answer questions by avoiding jargon and by asking follow-up questions to test the understanding of my response. Overall, most non-optometrists seem to understand the explanations that are offered to

(Continued on page 87)

Looking Toward the Future...



VA Optometry

With over 175 optometrists working in 153 medical facilities serving our Nation's 26 million veterans, VA offers more opportunities than any other health care system. Because of VA's affiliations with many schools and colleges of optometry, teaching and research opportunities are currently available in addition to direct patient care.

VA offers an outstanding opportunity for recent optometry graduates in our residency training program, that includes areas such as hospital-based, rehabilitative, geriatric, and primary care optometry. After one year, a VA residency-trained optometrist enters the workforce confident, capable, and qualified to fulfill virtually any professional opportunity. Residency programs run for one year from July 1 to June 30.

As valuable members of the VA health care team, our staff optometrists enjoy a broad range of clinical privileges and challenging interdisciplinary practices at VA medical centers, outpatient clinics, and blind rehabilitation centers. They are also well published in the ophthalmic literature. We invite you to join our team and work with the best. Where The Best Care.

For further information, please contact us at
Director, Optometry Service (112A)
Veterans Health Administration
VA Medical Center
9600 North Point Road
Fort Howard, Maryland 21052
410-477-7192 (telephone)
410-477-7193 (fax)

The Best Care

Department of Veterans Affairs
An Equal Opportunity Employer

Keeping an Eye On Our Past.

Evidence-Based Optometric Practice and Education

William M. Dell, O.D., M.P.H.

Optometric practice continues to change. Some of what we practice today is not based on sound evidence. We continue to face an exploding volume of literature, rapid introduction of new technologies, deepening concern about growing health care costs, and increasing attention to the quality and outcomes of health care. One change occurring in medical practice today is in the way in which clinicians evaluate and use the medical literature to more effectively guide physician practice. This shift is so profound as to appropriately be labeled a paradigm shift. The foundation for this shift lies in the advances in clinical research over the last 30 years and the need to demonstrate clinical efficacy in both diagnostic and treatment protocols by the use of randomized clinical trials. This new paradigm is known as evidence-based medicine. For optometric practice, we would, instead, employ the term, **"evidence-based optometry."**

This new philosophy is based on an awareness of the limitations of traditional determinants of clinical decisions and deals with the uncertainties of clinical practice. The shift to evidence-based practice de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision-making. It stresses the examination of evidence from carefully-controlled clinical research and introduces the need to include in our optometric educational process new skills required of the optometrist. These skills include efficient literature searching, and the application of formal rules of evidence in evaluating the clinical literature. Integrating external evidence with daily clinical experience caring for patients, and applying the results judiciously is one of evidence-based optometry's greatest challenges.

Today's optometric graduates must be educated in how to access, evaluate and interpret the optometric and medical literature. These skills include proposals to apply the principles of epidemiology to day-to-day clinical practice. More and more journals have adopted a more informative style of abstract presentation in which the study design and methods receive greater emphasis. Practice guidelines based on rigorous methodological review of the available evidence are becoming increasingly common.

Does evidence-based practice improve patient outcomes? The answer to this question is, in essence, the "proof of the pudding" for this new paradigm. Unfortunately, the proof is no more achievable for the new paradigm than it is for the old as there are no long-term randomized trials of traditional and evidence-based medical education. There are a few short-term studies, however, that seem to indicate that the teaching of evidence-based practice may help graduates stay up to date, a critical element in the quality of care.

The purpose of this article is not to present a formal and thorough review of evidence based practice but rather to introduce the concepts to the reader. Evidence-based optometry will require new skills for the optometrist, skills which our schools and colleges of optometry should be equipped to teach. While strategies for inculcating the principles of evidence-based optometry remain to be refined, initial experience has revealed a number of effective approaches. Incorporating these practices into optometric education will result in more rapid dissemination and integration of the new paradigm into optometric practice.

In concert with the overlying technology theme of this column, the reader is directed to on-line resources for further immersion in the subject. Following is a list, intentionally not exhaustive, of web sites related to the teaching and practice of evidence-based medicine/optometry. Explore!

1. National Guideline Clearinghouse™ (NGC) – a public resource for evidence-based clinical practice guidelines. NGC is sponsored by the Agency for Healthcare Research and Quality (formerly the Agency for Health Care Policy and Research) in partnership with the American Medical Association and the American Association of Health Plans http://www.guidelines.gov/index.asp

2. **An Introduction to Information Mastery, Department of Family Practice, College of Human Medicine, Michigan State University**

This is a Web-based course that introduces the basic concepts of Information Mastery, Evidence-Based Medicine (EBP), and critical appraisal of the medical literature. http://www.poems.msu.edu/InfoMastery/

3.How to Read a Medical Journal Article, by Steve Simon
http://www.cmh.edu/stats/journal.htm

4. Evidence-Based Medicine: What It Is, and What It Isn't
http://cebm.jr2.ox.ac.uk/

5. Centre for Evidenced Based Medicine
http://cebm.jr2.ox.ac.uk/

Dr. Dell is associate dean for educational programs at the Pennsylvania College of Optometry.

6. CASP - Critical Appraisal Skills Programme – CASP is a UK project that aims to help health service decision makers and those that seek to influence the decision makers develop skills to find, critically appraise and change practice in line with evidence of effectiveness. These skills promote the delivery of evidence-based healthcare. CASP introduces people to the ideas of evidence-based healthcare and, through critical appraisal of systematic reviews, introduces people to the related ideas of the Cochrane Collaboration. http://www.phru.org/casp/

7. Centre for Clinical Effectiveness – The Centre for Clinical Effectiveness objective is to enhance patient outcomes through the clinical application of the best available evidence about treatments. http://www.med.monash.edu.au/publichealth/cce/

8. The Cochrane Collaboration: Eyes and Vision Group – An international network of individuals working to prepare, maintain and promote access to systematic reviews of interventions to treat or prevent eye diseases or visual impairment. http://www.archie.ucl.ac.uk/

9. Evidenced Based Medicine Toolkit – This collection of tools for identifying, assessing and applying relevant evidence for better health care decision-making is based on the work of the Evidence Based Medicine Working Group" http://www.archie.ucl.ac.uk/

10. How to Teach Evidence-based Clinical Practice, 2000 – McMaster University Department of Clinical Epidemiology and Biostatistics have assembled sets of readings dealing with evidence-based medicine and critical appraisal issues in therapy, diagnosis, prognosis, harm, overviews and economic analysis. Some materials, complete with checklists and cribsheets is available on the Internet, and may be downloaded to support Critical Appraisal skills programmes locally. http://hiru.mcmaster.ca/ebm/

11. Evidence-Based Medicine Reviews – Ovid's Evidence-Based Medicine Reviews (EBMR) is a database designed for use by clinicians, researchers and students. Reflecting the current practice in medicine to base clinical decisions on accumulated evidence from the primary medical literature, Evidence-Based Medicine Reviews provides content from two premier sources: the Cochrane Library and Best Evidence. http://www.ovid.com/

12. Medical SmartSearch – This is a single gateway that attempts to provide references to answer clinical questions around diagnosis, etiology, prognosis and therapy (plus physical findings, adverse treatment effects and screening/prevention) by searching only high-quality sources. http://smartsearch.uthscsa.edu/cgi-bin/smartsearch.exe

Send column ideas to:
Dr. Dominick Maino (dmaino@eye-care.kent.edu)
or
Dr. William Dell (bdell@pco.edu).

Don't forget that you can subscribe to the ASCO INFOSIG by sending email: majordomo@spectacle.berkeley.edu. It should contain the message: subscribe infosig youremail@wherever.you.are. If you want to send a message to the INFOSIG list, address this to infosig@spectacle.berkeley.edu. The ASCO website can be accessed by logging on to www.opted.org

ASCO Meetings Calendar

ACADEMIC OFFICERS
June 18-20, 2000 — Las Vegas, Nevada — Contact: Joan Anson

ASCO EXECUTIVE COMMITTEE MEETING
June 20, 2000 — Las Vegas, Nevada — Contact: Marty Wall

ASCO ANNUAL MEETING
June 20 - 21, 2000 — Las Vegas, Nevada — Contact: Mary Eastman

ANNUAL LUNCHEON
June 21, 2000 — Las Vegas, Nevada — Contact: Mary Eastman

CORPORATE SPONSOR BREAKFAST
June 23, 2000 — Las Vegas, Nevada — Contact: Patricia Coe O'Rourke

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

ALCON®

Keeping Your Future In Sight™

- A worldwide company committed to the discovery, development and manufacture of ophthalmic products and instrumentation.
- Over the next 5 years, Alcon will invest more than $1 billion in eye-related research and development. That's an investment in your future.
- Alcon is uniquely positioned to continue its aggressive course of developing and producing the most innovative products and technologies.

Alcon®
LABORATORIES

INDUSTRY NEWS

Prio Donates Computer Vision Devices to Colleges

PRIO Corporation recently donated 12 computer vision testing devices to colleges of optometry around the country. Southern College of Optometry received six PRIO testers, SUNY College of Optometry in New York City was given four and two went to the University of Alabama at Birmingham's College of Optometry.

The PRIO device helps doctors determine the correct prescription for special eyeglasses worn while working at the computer. It is the only device available that simulates a computer screen and accurately measures a patient's visual response to the computer. According to the American Optometric Association, computer vision problems are more widespread than carpal tunnel syndrome, affecting more than 75% of computer users. In addition to the units, PRIO provides continuing education to faculty members and students. The donated PRIO devices are worth almost $60,000.

"PRIO is committed to supporting the future of optometry," said Jon Torrey, president and CEI of PRIO. "Computer vision care is a growing segment of the optometric market and by donating this state-of-the-art equipment to the schools, we are helping to prepare students for what lies ahead."

PRIO plans additional donations to other colleges of optometry. "We hope to offer every school a PRIO tester in order to assist them in building strong computer vision care programs," said Torrey.

B & L Awards Wichterle Research Grant

Bausch & Lomb announced that Dr. Irina A. Maklakova, Dr. Sergey N. Bagrov and Dr. Victor I. Sevastianov, all of Russia, have been awarded the Bausch & Lomb Wichterle Research Grant.

The winning proposal, chosen from a variety of optometric, ophthalmic and scientific research applications submitted from around the world, addresses the importance of the biocompatibility of contact lens materials with the cornea. The doctors have achieved the desired results in similar research they conducted on intraocular lenses and they now hope to extend that success to contact lenses.

The $10,000 grant is named after Otto Wichterle, the Czech scientist who is known as the father of soft contact lenses. Dr. Wichterle died in 1998, and Bausch & Lomb decided to honor his groundbreaking contribution to soft contact lens technology by creating this grant that inspires and rewards dedication and revolutionary thinking in contact lens research. For additional information, contact www.bausch.com

Vistakon Stresses Hazards of Sun Exposure

As part of its resolution to raise awareness of the importance of eye health, Vistakon encourages eye care professionals to talk to their patients about the hazards of sun exposure and methods to protect against possible short- and long-term repercussions to the cornea. Vistakon believes all outdoor enthusiasts should know that their eyes risk serious damage from the sun's direct and reflected ultraviolet (UV) rays. Standard measures to help protect the eyes from UV rays involve using UV protective sunglasses, a wide-brim hat and UV-blocking contact lenses.

In 1999 the U.S. Food and Drug Administration (FDA) approved a new indication for ACUVUE UV-blocking contact lenses that states the lenses "help protect against transmission of harmful UV radiation to the cornea and into the eye." All of the contact lenses in the ACUVUE product line – from ACUVUE® BIFOCAL to ACUVUE® 1-DAY Daily Disposable – incorporate the UV-blocking feature. ACUVUE contact lenses block approximately 82 percent of UV-A rays, and 97 percent of UV-B rays.

Zeiss Appoints Territory Managers, Introduces Perfect Vision Demo Kit

At the end of its most successful one-year increase in lens sales and its best financial performance (FY 98/99), Carl Zeiss Optical, Inc. announced the appointment of six new territory managers. The new managers will be responsible for identifying, developing and supporting eyecare professionals in their respective territories that will utilize Zeiss technology for their patients. Additionally they will work closely with assisting Zeiss partner labs with market development and support.

Zeiss also announced the availability of its new Perfect Vision Demo Kit. This kit contains a collection of facts and figures on Zeiss progressives, hard coatings and anti-reflective coatings tailored to support the daily work of the eyecare professional. The Demo Kit is used by the dispenser as an explanation tool to consumers while going through the dispensing process. Carl Zeiss Optical, Inc., located in Chester, Virginia, is the U.S. headquarters for the distribution of Carl Zeiss, Germany ophthalmic lens products, coating equipment, binoculars and riflescopes. For information, call 1-800-338-2984 or visit the Web site at www.zeiss.com

Marchon Will Partner With Nike

Marcon Eyewear, Inc., the world's largest privately owned eyewear company, and Nike Inc. announced that they have entered into an agreement to develop and distribute Nike Sport Eyewear.

Marchon will distribute Nike Eyewear primarily to the optical channel and select sun and sport

(Continued on page 95)

HIV, AIDS and Universal Precautions: The Optometry Curriculum's Effect on Students' Knowledge, Attitudes and Implementation

Kenneth J. Rosengren, O.D.
Rebecca K. Zoltoski, Ph.D.

Abstract

A survey was developed to assess the effects an optometric curriculum has on optometry students' HIV/AIDS knowledge, attitudes towards caring for infected patients, and their ability to properly implement universal precautions. Baseline data were obtained during first year orientation, and the survey was re-administered during the students' fourth year. Evaluation of data demonstrated a significant improvement from pre- to post-test for general HIV/AIDS knowledge, optometric specific HIV/AIDS knowledge, and attitudes. For universal precautions implementation, no change in overall score was noted; however, select individual procedure scores improved significantly. The students reported improved implementation scores for procedures they were familiar with, indicating the need for further training and "hands-on" experiences with these guidelines.

Key Words: *HIV/AIDS knowledge, universal precautions, optometry curriculum, AIDS education*

The Centers for Disease Control (CDC) currently projects one out of every 300 Americans is infected with HIV, and has reported greater than 600,000 cases of AIDS in the United States since 1981.[1] These numbers signal the impact HIV/AIDS has had and will continue to have on all health care disciplines. Educational programs have been developed to better inform medical personnel regarding this disease. Additionally, effective infection control guidelines have been developed to prevent occupationally linked HIV infections among health care providers.[2] The focal point of these guidelines are universal precautions, whereby all patients are treated equally, and any blood or blood contaminated fluid is assumed to be potentially infectious. Studies involving medical students, physicians, nurses, emergency medical, and public health personnel have been used to assess the ability of educational programs to enhance HIV-related knowledge, and foster workplace practices that prevent infection.[3-7] Results from these reports suggest increasing HIV/AIDS knowledge will have a positive impact on caregivers' willingness to treat AIDS patients, and may improve their attitudes towards infected individuals.[8,9]

The optometric literature has primarily focused on HIV-related pathology, infection control protocols, and the ethical treatment of HIV positive patients.[10-12] With the expanded scope of optometric practice, a correct understanding of HIV/AIDS issues, along with the proper utilization of universal precautions, is necessary for the responsible practitioner. As the practitioners of tomorrow, optometry students will be called upon to provide care at higher levels to larger numbers of patients at all stages of HIV disease. Through annual infection control seminars, ocular and systemic pathology, immunology, ethics and communication courses, our academic program has attempted to address a multitude of issues related to HIV/AIDS. To better understand our students' preparedness regarding these issues, we developed this study to evaluate their knowledge, attitudes, and understanding of infection control guidelines. Our hypothesis consisted of three points: (1) students' HIV/AIDS knowledge, both general and optometric, would be improved by the curriculum; (2) their attitudes towards caring for AIDS patients would improve because of their increased knowledge; (3) they would be better able to properly implement universal infection control guidelines as a result of the curriculum.

Methods

Through modification of existing surveys and the American Academy of Optometry's "AIDS Task Force Policy Statement," a survey was developed to assess four topical areas: general HIV/AIDS knowledge, optometric specific HIV/AIDS knowledge, attitudes towards infected individuals, and the ability to properly implement universal precautions (see Appendix 1).[4,5,13] The questions of general knowledge addressed transmission modes and other basic facts about HIV/AIDS and were answered

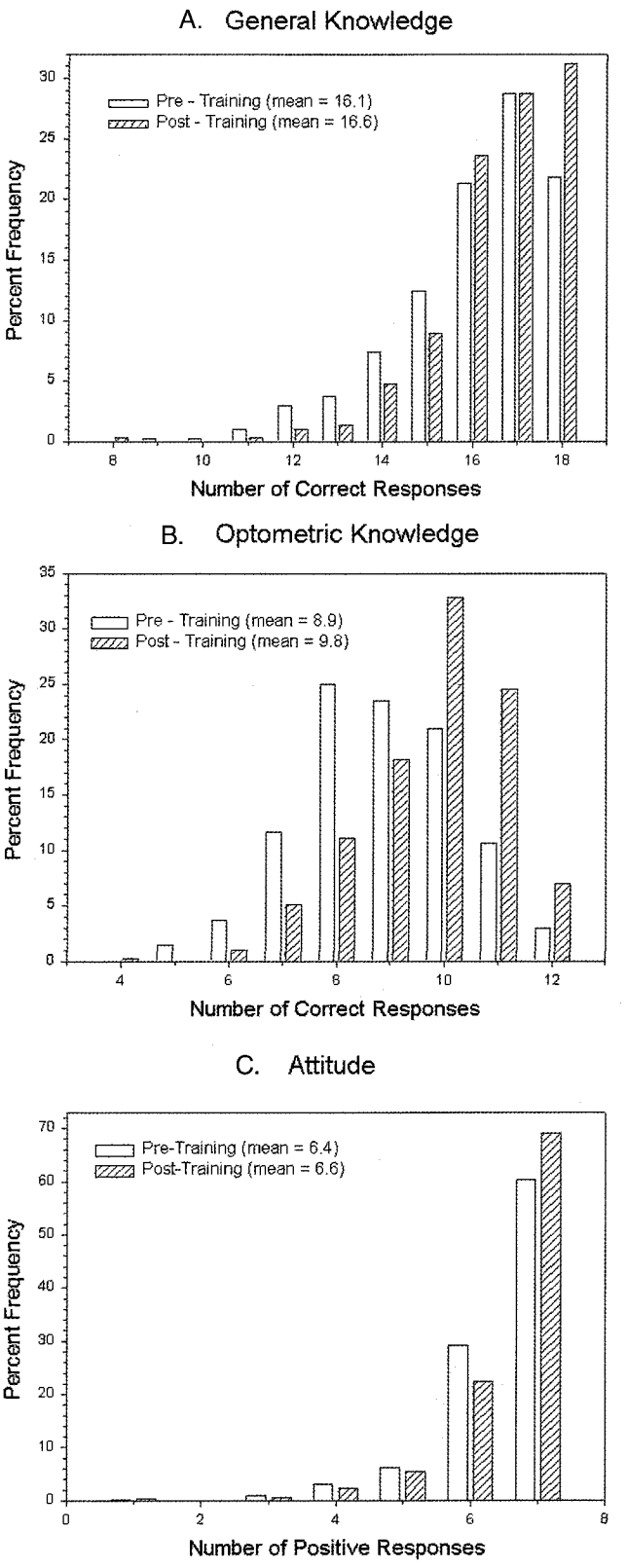
When this article was written, Dr. Rosengren was assistant professor at Illinois College of Optometry. He received his optometric degree from ICO in 1989 and completed a residency in hospital-based optometry at the St. Louis Veterans Affairs Medical Center in St. Louis, Missouri. He recently joined the Vision Rehabilitation Services, Section of Opthalmology, Eye Center, Emory University in Atlanta. Dr. Zoltoski is an assistant professor of biological sciences at Illinois College of Optomerty. She received her doctorate in neuro-pharmacology from Wake Forest University.

yes or no based on whether or not the subject felt the statement was correct. Optometric specific knowledge questions required the subject to decide if a statement was true or false. These statements were based on recommendations from the American Academy of Optometry, pertaining to office procedures and the provision of care.[13] To assess attitude, statements addressing willingness to provide care and the compassionate delivery of care were used. Subjects responded by either agreeing with the statement or not. Each positive response received a score of one point, while negative responses received a zero. To assess understanding of universal precautions, subjects were asked to select the appropriate level of personal protective equipment recommended for a series of procedures. The levels were: no protection measures required; only a mask required; only gloves required; gloves and mask required; and gloves, mask, and protective eyewear required.

The survey was administered, on a voluntary basis, to three consecutive class years during first year orientation (pre-test), and again to these same students during their fourth academic year (post-test). Instructions included with the survey outlined the purpose of the study and ensured the confidentiality and anonymous nature of all the responses. Properly completed pre-test questionnaires were received from 404 out of 506 incoming students (79.8%) and from 314 out of 411 graduating students (76.3%) for the post-test. All questionnaires were analyzed using the Scantron (Scantron Co., Tustin CA) system, which supplied individuals' responses for each question. From these values, we obtained the following variables by totaling correct responses for each individual: general HIV/AIDS knowledge (out of 18 questions), optometric-specific HIV/AIDS knowledge (out of 12 questions), and attitudes towards infected individuals (out of 7 questions). The ability to correctly implement universal precautions was analyzed by assessing each question as well as totaling each individual's score for the seven questions. The individual responses were rated according to under-implementation (-1), correct implementation (0), or over-implementation (+1) and then these ratings were totaled. From this rating scale the range of total scores could be -7 (always under-implementing) to +7 (always over-implementing)

Figure 1

The curriculum's impact on student's knowledge and attitude. Bars represent frequency of correct responses. A. Percent Frequency of Correct Responses for the 18 general HIV/AIDS knowledge questions with significant improvement. B. Percent Frequency of Correct Responses for the 12 optometric specific knowledge questions demostrating significant improvement. C. Percent Frequency of Positive Responses for the 7 attitude questions showing small significant improvement.



with a score of 0 corresponding to correct implementation on all 7 questions. Non-parametric analysis (Mann-Whitney rank sum and Chi-squared tests, SPSS Inc.) was used to assess the impact of training on testing results with a significance level of 0.05.

Results

Results of the knowledge and attitude questions are summarized in Figure 1. A descriptive analysis of the 18 general HIV/AIDS questions resulted in a pre-test mean of 16.1 (89.5%) and 16.6 (92.2%) for the post-test. The number of correct responses for these questions ranged from 6-18 for the pre-test and 10-18 for the post-test with an overall shift towards the higher scores for the post-test. As can be seen from Figure 1, the frequency of students that correctly answered all questions increased from 21.8% to 31.2%. Further analysis using Mann-Whitney rank sum test demonstrated significant improvement in their post-test scores ($Z=-3.75$, $p<0.0005$, $N=718$). Similar analysis of the 12 questions evaluating optometric-related HIV/ AIDS knowledge resulted in a pre-test mean of 8.9 correct (73.8%) with a range of 5-12 and a post-test mean of 9.8 (81.4%) with a 4-12 range. Figure 1 demonstrates the impact training had upon the number of correct responses by shifting the distribution towards a greater number of correct responses. For example, following training, the number of students that correctly answered 10 questions increased from 21% to 32.8%, while the number of students that correctly answered 11 questions increased from 10.6% to 24.5%. This overall difference represented a 10.3 percent change in improvement in optometric-specific HIV/AIDS knowledge as compared to their pre-test scores ($Z=-8.38$, $p<0.0005$, $N=718$). For the 7 questions evaluating attitude the means were 6.4 (92.0%) and 6.6 (93.7%) for the pre- and post-tests respectively. Response ranges for this section were from 1-7 for both the pre- and post-tests, however, the distribution did adjust towards a more positive attitude after training (Figure 1). Although, a statistically significant difference was detected, the small magnitude of the change decreased its relevance ($Z=-2.32$, $p=0.02$, $N=718$).

For the universal precaution questions, students were required to select the correct level of personal protective equipment necessary for each procedure from the following list: 1) no protective measures required; 2) only a mask required; 3) only gloves required; 4) gloves and mask required; 5) gloves, mask, and protective eyewear required. When the rated individual responses for all procedures were summed, there was no significant improvement in implementation scores (data not shown). By analyzing each procedure separately, noticeable differences became apparent (Figure 2). For procedures, such as handling laboratory specimens, the percentage of students who selected the correct level of precautions significantly increased from 28.9% to 48.9% ($Z = -6.46$, $p< 0.0005$, $N = 718$). Significant improvements in correct implementation were also seen for contact with a coughing patient (35.4% to 48.3%), ($Z = -2.84$, $p< 0.0005$, $N = 718$) casual patient contact (87.9% to 95.6%), ($Z = -3.41$, $p< 0.0005$, $N = 718$), and for touching non-intact skin (66.0% to 71.7%), ($Z = -2.21$, $p = 0.03$, $N = 718$). However, for suturing there was no change in correct implementation percentage (47.9% to 49.5%), while both drawing blood and starting intravenous lines demonstrated a significant decrease in correct implementation percentage. These results decreased from 65.0% to 53.2% ($Z = -4.25$, $p< 0.0005$, $N = 718$) and from 52.3% to 42.6% ($Z = -4.69$, $p< 0.0005$, $N = 718$) for drawing blood and IV lines respectively.

To better understand how students were improperly utilizing universal precaution guidelines, we re-analyzed the data to determine whether they were over- or under-protecting themselves. A score of zero was assigned to the correct response for each procedure. For each level of under-protection they were given a -1 score, and for each level of over-protection they were given a +1 score. For example, if the correct response was "only gloves required," those who responded so received a 0 score, while those who selected "only a mask" received a -1, and those who selected "no protective measures required" received a -2. Similar scores were

Figure 2

Percent of students that apply correct implementation of Universal Precautions increases significantly for "hands-on" learning experiences.
Bars represent the percent of students who knew the correct protection to use in each situation, * = $p < 0.05$.

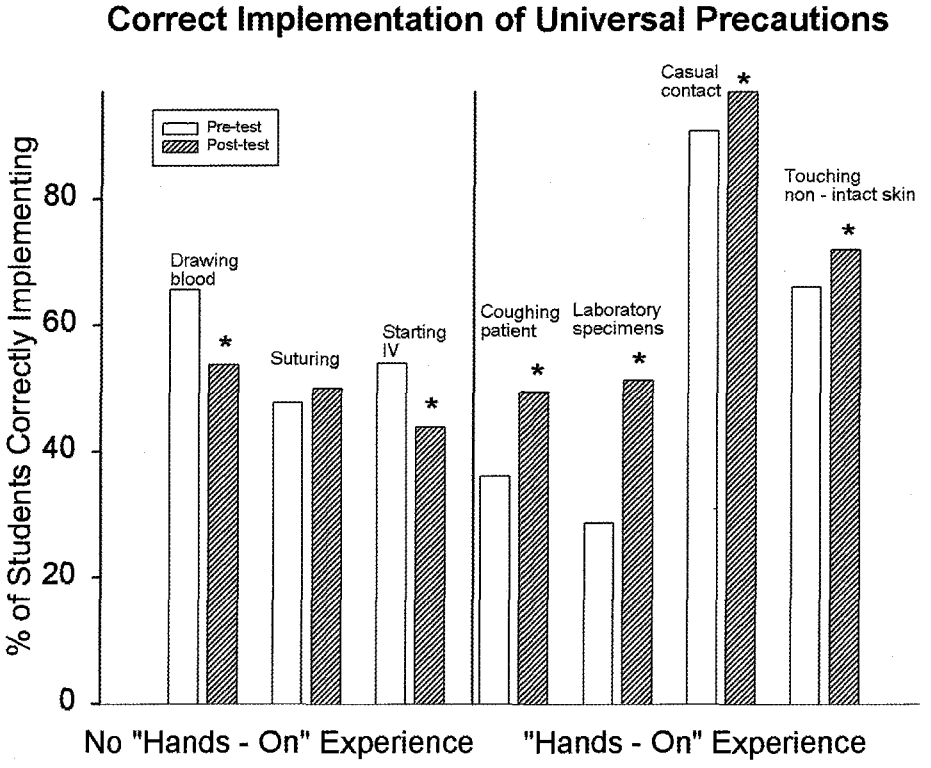
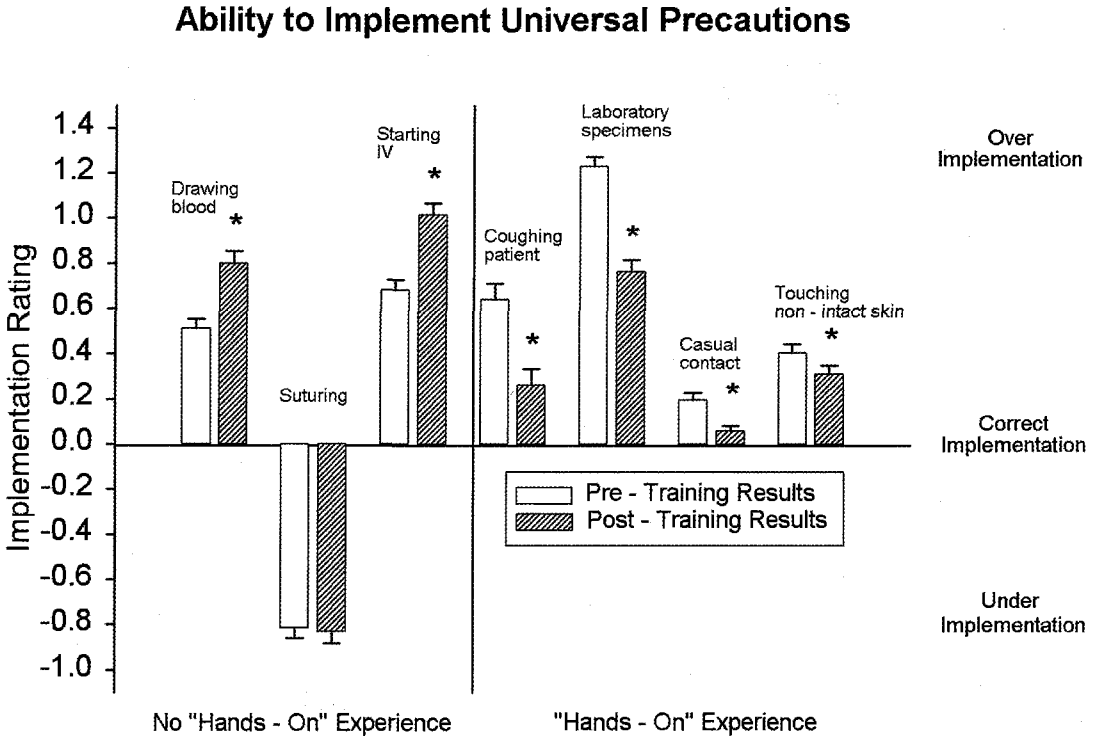


Figure 3

"Hands-on" learning experiences increased the ability to correctly implement universal precautions. A score of zero represents correct protection, while a score greater than zero is over protection, and a score of less than zero is under protection. Bars represent mean + SEM, * = $p < 0.05$.



assigned for over-protection using +1 and +2. As shown in Figure 3, the most dramatic decrease from over utilization of personal protective equipment was noted for handling of lab specimens ($Z = -6.53$, $p < 0.0005$, $N = 718$). Additionally, we saw that for casual contact with a patient ($Z = -3.41$, $p = 0.0006$, $N = 718$), touching non-intact skin ($Z = -2.24$, $p = 0.03$, $N = 718$), and contact with a coughing patient ($Z = -2.84$, $p = 0.005$, $N = 718$), there was a significant decrease from over-utilization of protective equipment to correct utilization. For suturing there was no change in under-utilization from pre- to post-test. Lastly, for drawing blood ($Z = -4.04$, $p < 0.0005$, $N = 718$) and starting IV lines ($Z = -4.53$, $p < 0.0005$, $N = 718$) there was a significant increase in over-protection from pre- to post-test.

Discussion

Entering optometry students demonstrated an impressive knowledge of basic HIV/AIDS facts. The pre-test knowledge mean of 89.5% for our subjects was higher than we had anticipated. By comparison, LeBlanc, using the 1987 National Health Interview Survey, administered by the U.S. Bureau of Census, examined the health-related knowledge of 17,696 civilians. His analysis of these data found a mean score of 50% for HIV-related knowledge. He also found educational attainment as the strongest determinant of HIV-related knowledge.[14] While not directly comparable, his results do suggest entering optometry students should have a greater HIV knowledge base, due to their higher educational attainment than the general population. Additionally, the emphasis upon the biological sciences within the admission requirements may have contributed to our subjects' higher scores.

Leblanc's survey evaluated the general population's understanding of HIV/AIDS issues; however, a better comparison group for our students would be other health care professionals.[14] The general HIV/AIDS knowledge section was developed through modification of an existing survey, which was used to evaluate public health department personnel's knowledge. It looked predominantly at modes of transmission and resulted in a mean correct score of 83% for these professionals.[5] Other medical professionals have been similarly evaluated. In 1993, Passannante et.al. conducted a highly detailed survey assessing health care providers' knowledge of HIV transmission modes. This survey found mean scores of 71% for physicians, 66% for dentists and 65% for nurses.[15] The differences between our results are likely due to the detailed nature of their survey.

We confirmed our hypothesis that completion of our academic program would improve the subjects' general HIV knowledge score. While an increase in mean correct responses from 16.11 to 16.6 is statistically significant, we believe of more importance is the shift in the frequency distribution, by training, towards more students choosing correct responses. In 1993 Held compared the effect an AIDS education program had upon physical therapy students' knowledge. By

dividing the subjects into an experimental group, which received an AIDS educational unit, and a control group which did not, they were able to assess the program's impact. They found a significant improvement in knowledge for the experimental group as compared to the control.[16] Similarly, Souheaver's survey of practicing rehabilitation professionals found those who had attended a post-graduate training seminar on AIDS scored significantly higher than those who had not.[17] The importance of our results as compared to others is difficult to assess, because our incoming mean was higher than expected and all of our students received training. Therefore, our small shift in general HIV/AIDS knowledge is difficult to assess in a relevant manner, but appears to support continued training.

As the facts and procedures covered within the optometric-specific HIV/AIDS knowledge section would be less likely to have been covered in undergraduate programs, we expected to obtain a lower pre-test score. The 73.8% pre-test mean supports this hypothesis. Held's research on entry-level physical therapy students indicated similar results, with a lack of knowledge of HIV/AIDS and related aspects pertinent to their future profession[16]. Our academic program positively affected the students' knowledge, as there was a 10.3 percent change from the pre- to post-test. Other researchers have found a positive correlation between improved HIV/AIDS knowledge and AIDS diagnostic and management skills.[8,18] This may seem like a small benefit; however, any improvement in optometric-specific knowledge should aid the handling of HIV/AIDS issues within clinical settings and strengthen management of these patients. Small changes can often correlate to larger benefits for the general population and should not be dismissed, but rather strengthened.

The results for the attitude section demonstrated a small change from pre- to post-test, with respective means of 92.0 and 93.7%. While statistically this change was significant, its relatively small value calls into question its relevance. The very positive pre-test attitudes towards these patients were not expected and made a pronounced change in attitudes less likely. Other researchers have found less positive attitudes among health care providers, with method of infection as the most significant factor contributing to poorer attitude.[19] Overall, AIDS educational programs have shown mixed results in their impact upon attitude. Results ranging from improved attitude, no change in attitude, to poorer attitude have been noted by other researchers.[8, 9, 19-25] Several of these studies found a strong relationship between perceived risk and attitude. For medical and dental students and nurses, the greater the risk of infection within their specialty or procedures performed, the poorer their attitude towards providing these services.[21, 24] The lower perceived infection risk within optometry may account for our subjects' positive attitude. However, this explanation is contradicted by Winslow's 1992 survey of practicing optometrists. This survey found only 20% of optometrists felt "very comfortable" caring for an HIV positive patient and that 66% believed they should be able to choose whether or not to care for AIDS patients[26]. Only 10% of the respondents to this survey reported receiving HIV/AIDS information in optometry school, and we believe this difference may have contributed to the less positive attitude. Additionally, the increase in understanding of HIV and its transmission from 1992 to today also supports obtaining a more positive attitude from our respondents.

The overall score for correct implementation of universal precautions did not significantly change from the pre- to post-test, and therefore did not support our belief that increased knowledge would improve utilization of the guidelines. McCann's research with nurses did find improvement regarding their knowledge of infection control protocols after an educational program.[19] This suggests additional emphasis needs to be placed on these protocols within our program. Of more interest, we believe, are the rates of over- and under-protection. For procedures students had likely performed or observed during their program such as handling laboratory specimens, and touching non-intact skin, there was a significant improvement in correct implementation. Other procedures such as drawing blood and starting IV lines demonstrated a significant increase in over-protection. A study at Southern California College of Optometry found that the number of potential blood exposures or uses of a needle was only 0.95 to 18.71 per 10,000 patient encounters.[27] Therefore, it may be their lack of experience in this area that led to greater anxiety, and thereby a belief in the need for greater protection. An additional consideration is the potential for multiple levels of infection control precautions depending on the patient's status. McCann et al. found additional precautions were taken when a patient's HIV positive status was known.[19] As direct observation of behavior was not an aspect of this study, we are left to assume our subjects answered, based on how they perceive they will behave towards all patients. However, the high levels of over-protection for these higher-risk procedures may be a more accurate prediction of how the students will handle situations when they know or perceive the patient to be HIV positive.

Conclusion

The academic program did significantly increase the knowledge of optometry students regarding HIV/AIDS. They had an overall positive attitude towards these patients both before and after their academic program, and generally were able to properly utilize infection control protocols for procedures they were likely to encounter. With no vaccine or cure for HIV in sight, and with the increased scope of optometric practice, continued effort will be necessary to insure all optometrists possess the necessary knowledge of HIV/AIDS, and the ability to properly utilize universal precautions. Future studies to increase insight into this area might consider using a Likert scale to more fully assess attitude scores. Additionally, procedures more likely to be encountered in an optometric settling, such as foreign body removal, peri-ocular wound cleaning, and chemical burn irrigation could be included within the infection control section. Questions could also address how often students used personal protective equipment during their rotations and the variety and number of procedures encountered that would require the implementation of infection control guidelines. Increased information on these issues will aid academic programs in preparing students for their future challenges.

References

1. Centers for Disease Control, HIV/AIDS Surveillance Report. 1998 10(2): 1-43.
2. Centers for Disease Control Update: Universal Precautions for prevention of

transmission of human immunodeficiency virus, hepatitis B virus and other bloodborne pathogens in health-care settings. MMWR 1988 37:377-88.
3. Garber N. OSHA regulations on universal precautions: a sample training curriculum. J Ophth Nursing Tech 1993 12(1): 5-11.
4. Koenig S, Chu J. Senior medical students' knowledge of universal precautions. Acad Med 1993 68(5): 372-4.
5. Randall LM, Bryce JW, Bertler MJ, Pope RS, Lawrenchuk DW. Need for HIV education among public health personnel in Michigan. Public Health Rep 1993 108(1): 127-31.
6. Smyser MS, Bryce J, Joseph JG. AIDS-related knowledge, attitudes, and precautionary behaviors among emergency medical professionals. PubHealth Rep 1990 105(5): 496-504.
7. Talan DA, Baraff LJ. Effect of education on the use of universal precautions in a university hospital emergency department. Annals Emer Med 1990 19(11): 1322-6.
8. Boremann J, Brent S, Mood D. The effects of an AIDS diagnosis on undergraduate nursing students' care of dying patients. Nurse Educ 1995 20(6): 15-21.
9. Jameson CP, Glover PH. AIDS education in schools- awareness, attitudes and opinions among educators, theology students and health professionals. S Afr Med J 1993 83(9): 675-9.
10. Conrad V. Transmission of human immunodeficiency virus, hepatitis B, and tuberculosis: infection control protocol. Clin Eye Vision Care 1994 6(2): 80-3.
11. Harkins T, Herriott KB. Medical management of acquired immune deficiency syndrome patients: a review. J Am Opt Assoc 1992 63(1): 35-42.
12. Wilson RJ. Optometric education's challenge: AIDS in the curriculum. J Optom Educ 1988 13(3): 73-8.
13. AIDS Task Force Policy Statement, Section on Public Health and Occupational Vision of the American Academy of Optometry. Am J Optom Physiol Opt 1988 65(7): 559-601.
14. LeBlanc AJ. Examining HIV-related knowledge among adults in the U.S. J Health Soc Behav 1993 34(1): 23-36.
15. Passannante MR, French J, Louria DB. How much do health care providors know about AIDS? Am J Prev Med 1993 9(1): 6-14.
16. Held SL. The effect of an AIDS education program on the knowledge and attitudes of a physical therapy class. Phys Ther 1993 73(3): 156-64.
17. Souheaver HG, Benshoff JJ, Wright WR, Riggar TF. AIDS knowledge among rehabilitation professionals. J Rehab 1996 62(2): 21-6.
18. Sowell R, Seals G, Wilson B, Robinson C. Evaluation of an HIV/AIDS continuing education program. J Contin Educ Nurs 1998 29(2): 85-93.
19. McCann TV, Sharkey RJ. Education intervention with international nurses and changes in knowledge, attitudes and willingness to provide care to patients with HIV/AIDS. J Adv Nurs 1998 27(2): 267-73.
20. All AC, Sullivan L. The effects of an HIV/AIDS educational programme on the anxiety level of nursing students. J Adv Nurs 1997 26(4): 798-803.
21. Anderson DG, Call RL, Vojir CP. Differences in HIV knowledge and attitudes between first- and fourth-year dental students. J Dent Educ 1994 58(8): 668-72.
22. Anderson DG, Vojir C, Johnson M. Three medical schools' responses to the HIV/AIDS epidemic and the effect on students' knowledge and attitudes. Acad Med 1997 72(2): 144-6.
23. Balogun JA, Kaplan MT, Miller TM. The effect of professional education on the knowledge and attitudes of physical therapist and occupational therapist students about acquired immunodeficiency syndrome. Phys Ther 1998 78(10): 1073-82.
24. Jemmott LS, Jemmott JBd, Cruz-Collins M. Predicting AIDS patient care intentions among nursing students. Nurs Res 1992 41(3): 172-7.
25. Lester L, Beard B. Nursing students' attitudes towards AIDS. J Nurs Educ 1988 27(9): 399-404.
26. Winslow C. The fact and fiction of treating HIV-patients. Rev Optom 1992 129(2): 87-8.
27. Hoppe E. Quantifying the risk of blood exposure in optometric education. Optom Educ 1997 22(2): 60-6.

Appendix 1

General HIV/AIDS Knowledge Questions

Answer the following questions either Yes or No.

It is possible to contract or transmit HIV by:

Receiving a blood transfusion	Yes
Donating Blood	No
Working near someone with AIDS	No
Eating in a restaurant where the cook has AIDS	No
Shaking hands or touching someone with AIDS	No
Sharing eating utensils with someone who has AIDS	No
Using public toilets	No
Sharing needles for drug use with someone who has AIDS	Yes
Being coughed or sneezed on by someone who has AIDS	No
Attending school with a child who has AIDS	No
Being bitten by a mosquito that has bitten someone with AIDS	No
Having sex with a person infected with HIV	Yes
Caring for a person infected with HIV	No
A women infected with HIV can give it to her baby	Yes
AIDS is caused by a virus	Yes
You can tell if people have AIDS just by looking at them	No
The Federal Government requires an HIV test to obtain a marriage license	No
In Illinois it is possible to receive a free and anonymous HIV test	Yes

Optometry Related HIV/AIDS Questions

Answer the following questions either True or False.	
Hand washing should be performed before, between and after the examination of every patient.	True
Latex gloves should be worn if the patient has an open or weeping lesion.	True
Latex gloves should be worn if the examiner has a break in his/her skin indicated by stinging during a daily alcohol hand wash.	True
A 10 to 30 minute exposure to 0.5% sodium hypochlorite (Bleach) is recommended for the sterilization of tonometer tips and other instruments.	True
Hydrogen peroxide is not approved for the disinfection of tonometer tips and other instruments.	False
Ethanol has been approved for disinfection of tonometer tips and other instruments.	True
Isopropyl alcohol, while damaging to tonometer tips, may be used for disinfection of these and other instruments.	True
Thirty minutes of a heat system at 78 to 80(C is acceptable for disinfecting compatible contact lenses for HIV and other pathogens.	True
A 10 minute soak in 3% hydrogen peroxide is acceptable for the disinfection of trial contact lenses according to Center for Disease Control guidelines.	True
A 20 minute soak in either Renu or Opti free brand disinfection solutions is acceptable for the disinfection of trial contact lenses according to the Center for Disease Control guidelines.	False
Masks and protective eyewear should only be worn if there is a risk of a body fluid splash or spill.	True
Patients who are HIV+ and/or have AIDS should be discouraged from wearing contact lenses.	False

Attitude Questions

Answer the following questions either Yes or No.
The precautions I take while working are adequate to prevent me from becoming infected with HIV.
Denying care to a person with AIDS would be wrong.
Patients who are known or suspected to be infected with HIV should be viewed with compassion regardless of how they became infected.
Individuals infected with HIV deserve the same quality of treatment as any other patient.
I would be willing to provide routine services which are my responsibility to an individual infected with HIV.
Children infected with HIV should be permitted to attend school.
An optometrist should be allowed to refuse to provide appropriate services to a patient because that patient is infected with HIV.

Universal Precaution Questions

For each procedure select the appropriate level of protection from the following list:

A. no protective measures required
B. only a mask required
C. only gloves required
D. gloves and mask required
E. gloves, mask and protective eye wear required

Procedure	Correct Answer
Drawing Blood	Only gloves required
Suturing	Gloves, mask and protective eye wear required
Contact with a coughing paitent	Only a mask required
Handling laboratory specimens	Only gloves required
Starting intravenous lines	Only gloves required
Casual contact with a patient	No protective measures required
Touching non-intact skin	Only gloves required

The Prevalence of Unethical Student Behavior in Optometry Schools

D. Leonard Werner, O.D.
Michael H. Heiberger, O.D., M.A.
Jerome Feldman, Ph.D.
Edward Johnston, O.D., M.P.A.

Abstract

Purpose: *To determine the extent of unethical behaviors among second and third year optometry students and to compare the findings with those of a similar study of medical students.*

Method: *Questionnaires were collected anonymously from 2nd and 3rd year students at 16 optometric schools. The data collected was tabulated and analyzed. The survey items related to students' awareness of unethical behaviors among peers as well as whether they personally have cheated in optometry school or in previous schools.*

Results: *A total of 1092 responses were received from 16 schools representing 43.9% of the 2nd and 3rd year students enrolled at these schools. 5.5% of the respondents admitted to cheating in optometry school, (males being twice as likely to admit cheating than females) compared to 13.9% who admitted cheating in college prior to entering professional school. Two-thirds of those who admitted cheating in optometry school admitted to cheating previously. The optometric student data was very similar to that of similar studies in medical schools which indicated that self-reported cheating ranged from 4.7% to 10%. The student's awareness that the school has an honor code results in less cheating. One type of unethical behavior revealed is the dishonesty relating to clinical record keeping. Invited student comments indicated that while they considered ethical behaviors an important issue and one they feel the schools should address, they have no illusions cheating can ever be totally eliminated.*

This is in spite of their feeling that cheaters essentially hurt themselves and the dishonest behavior is an predictor of behaviors later when in practice.

Conclusions: *Some might feel that any amount of unethical behavior by professional students can be considered excessive; however reality suggests that educators need to work to minimize this behavior. The indication that the institution can, and should, do more to create the appropriate environment was revealed in this study. This is consistent with similar reports in the health education literature. There is the belief and concern that impressionable students who participate in, or observe, unethical behaviors will become unethical care givers later in life.*

This study was funded from a grant by CIBA Vision to the Association of Schools and Colleges of Optometry.

Introduction

Unethical behaviors in various segments of our society have been highly publicized. Student cheating has been reported in both the professional as well as the lay press. A study conducted among Who's Who Among High School Students revealed that 65% of the students admitted they copied someone else's homework, and 38% said they cheated on a test.[1] Similarly in an article studying the ethical behaviors of medical students, Baldwin reported 40.5% of the medical students admitted cheating while in high school. He also indicated that males were more likely to report having cheated than females. Among the 4.7% of the medical students who admitted cheating in medical school, the best predictor of medical school cheating was whether the student had cheated before, since a majority of those admitting cheating in medical school had a pattern of cheating behaviors since junior high school.[2] Satterwhite, Satterwhite, and Enarson concluded that the medical school environment strongly influences these undesirable behaviors since 90% of the medical students in their study reported observing unethical conduct by residents and attending physicians by the time they reached their 4th year.[3]

There are other examples in the medical education literature reporting studies attempting to learn the depth of unethical student behavior. While most discussions focus on the more traditional student cheating behaviors, unethical student behaviors also may include plagiarism, acquiring testing material prior to the test, substitute test takers, falsifying patient findings, and altering official records.

This study represented the first time that optometry has systematically attempted to learn more about the unethical behavior of its students. The absence of this issue within the optometric literature should not suggest a lack of interest among optometric educators. Attendees of the

All of the authors are from the State College of Optometry, State University of New York. Dr. Werner is a distinguished teaching professor at the college and chair of ASCO's Ethics Educators Special Interest Group (SIG). Dr. Heiberger serves as director of planning and evaluation and is an associate clinical professor. Dr. Feldman is the associate dean of graduate studies and research and director of the Schnurmacher Institute for Vision Research at the college. Dr. Johnston is vice president for student affairs.

March 1997 meeting of optometric ethics educators were polled concerning their perceptions of cheating among optometric students. Fifteen of 19 attendees responded. Perhaps the most revealing of the findings was that 80% of the responders reported their impression that dishonesty in optometry school is a predictor of dishonesty in the future, and while 100% of the educators indicated that cheating in optometry school can be reduced, few thought it could be eliminated.

Dans wrote that 81% of the medical students who admitted cheating agreed that "cheating made for less trustworthy physicians."[4] The percentage of students who have cheated in medical school has been reported as ranging from 4.7% to 10 percent. Sierles and colleagues disclosed correlations between cheating in medical school, cheating in college, and a cynical attitude towards cheating. Most importantly, they also found that those who cheat in medical school tests are also more likely to falsify patient data while in the clinics. As a result, they concluded that students with a cynical attitude about cheating in general and a history of cheating in college are more likely to cheat in medical school and are at risk of cheating in medical practice.[5]

Bilge, Shugerman, and Robertson studied 424 applications to a pediatric residency program and found that 19.7% of the candidates claimed authorship of publications that could not be authenticated. In a smaller sample of 31 applicants to a pediatric pulmonary fellowship, 30% of the candidates' publications could not be confirmed, including four in nonexistent journals.[6]

In 1996, Baldwin and colleagues reported the results of their anonymous medical student questionnaires. They surveyed second year medical students attending 31 schools and found that while 4.7% personally admitted cheating in medical school, 39% of the students reported witnessing some type of cheating by others.[2]

The authors of this study agreed that Dr. Baldwin's approach was the most desirable for our purposes, and with his permission much of his survey document was utilized, with the addition of a few questions. Although Baldwin surveyed 2nd year medical students, this study surveyed 2nd and 3rd year optometry students in order to increase the numbers and also to gain insight into behaviors in the clinic. As a result of this need to learn more about clinical behaviors, we added a few questions to the Baldwin questionnaire. Several goals were established for the study:

1. To compare our findings with another health profession, i.e., medicine. Some potential differences may have been anticipated since:
   a. we polled both 2nd and 3rd year students rather than only 2nd year.
   b, our survey was performed a number of years later.
   c. our student population had a higher percentage of females. (Baldwin reported that females admit to cheating at a lesser rate than males).
2. To create baseline data for future attempts to learn if unethical behaviors are changing over time in type or frequency;
3. To compare various forms of cheating: classroom, clinic, documentation falsification, etc.;
4. To compare cheating in optometry school with the students' previous cheating history;
5. To learn more about the students' opinions concerning academic dishonesty; and
6. To learn whether the existence of an institutional honor code influences cheating.

There was concern with the concept of the students' self-reporting; however, in spite of its weakness, we felt that there was no better approach to quantify these behaviors. The impressions of faculty and/or administrators cannot be quantified, and the numbers of students that the schools might officially identify as cheaters would, for various reasons, represent too small a number. Since schools vary in their procedures as well as their documentation of this behavior, the results of such a study would be of questionable value. This was illustrated by Fishbein's study in a general academic setting, which reported that 45 percent of the students on his campus cheated occasionally and 33 percent were "hard-core offenders," yet only 80 cases of cheating were reported annually among the 35,000 students.[7]

It is generally acknowledged that an anonymous self-reporting approach would reveal a low number of personal transgressions since it can be assumed that few professional school students would over-estimate their dishonest behavior. This would also have applied to Baldwin's medical school study and others using this self-disclosure approach. It is logical to assume that the results generated would represent minimums.

Methods

The survey form consisted of two sides of one sheet of paper and contained several sections. The first portion of the form consisted of questions concerning class year (2nd or 3rd), gender, and age. The next part asked whether the students have observed, heard about, or have never seen nor heard about 12 defined unethical behaviors. Three of these questions were added to Dr. Baldwin's survey form and related to falsifying information on patient record forms. Two of these additional questions were directed only to those students who have examined patients. The next section used a Likert scale of 1 through 7 to quantify the specific responses to 13 attitudinal-type questions. Additional questions asked whether the responder ever cheated in junior high school, high school, college, or optometry school and whether or not the student was aware of an honor code at his/her school. The final portion of the form encouraged student comments.

The survey document was pretested using a group of students from the Class of 1998 at the State College of Optometry, State University of New York, who would not be included in the actual study. They reported that the questions were clear and it was learned that the process took approximately 10 minutes. They suggested that students would have more confidence in the confidentiality if the questionnaire was administered by the student affairs officer in the respective schools.

The chief executive officer of each of the schools of optometry received a written request asking for the school's cooperation with this study. The purpose and methods of the study were revealed with the indication that just as each student's response was anonymous, no school will be identified with the results. Sixteen of the chief executives agreed and identified the respective student affairs officer who would conduct the survey.

A letter was then sent to the student affairs officers requesting their cooperation in distributing, collect-

ing, and returning the questionnaires. The results were then tabulated.

Results

The results of the questionnaire are on Tables 1, 2 and 3. A total of 610 2nd year students completed the forms, which represents 46.6% of the second year population of the schools responding, and 442 3rd year students responded, which was 36.8% of the third year census. The responses by gender were 474 males (44.4% of those responding) and 595 females (55.6% of those responding).

The percentage of the students who agreed or disagreed with the survey questions are presented in Table 1 along with comparisons from the medical school survey. (Medical school results are presented in parentheses in Tables 1, 2, and 3.) The results are quite similar to those reported in the medical school survey, Students in both studies denied that "everyone cheats in professional school" and did not rationalize cheating as a normal outgrowth of the competitive nature of their respective schools. Most would not cheat even if they were certain they would not get caught and agreed that cheating is not innocuous. In spite of these apparently virtuous beliefs, a majority of both optometric and medical students would not be inclined to

Table 1

Students' Attitudes toward Cheating in Optometry School, 1,092 Second and Third-Year Students in 16 U.S. Optometry Schools, 1997-98 Compared with Students' Attitudes in Medical School, 1990-91 (Baldwin et. al.).* Medical school data is in parentheses.

Item	% Disagree	% Agree	Mean	SD	Mean Rating of Those Who Reported Cheating in Jr. High School	High School	College	Optometry School
Everyone cheats in optometry school at one time or another	73.6 (80.5)	13.6 (12.5)	2.37 (2.21)	1.65 (1.59)	2.6† (2.3†)	2.8‡ (2.3†)	3.6‡ (2.7†)	4.8‡ (4.0†)
Anyone caught cheating in optometry school should be immediately dismissed.	20.3 (44.0)	61.0 (47.2)	4.99 (4.11)	1.86 (1.92)	4.6‡ (3.8†)	4.5‡ (3.9†)	4.0‡ (3.4†)	3.8‡ (2.9†)
If I became aware of a classmate cheating, I would turn him or her into the proper authorities.	33.8 (38.3)	30.4 (42.0)	3.89 (4.03)	1.64 (1.73)	3.5‡ (3.8†)	3.4‡ (3.9†)	3.1‡ (3.6†)	2.9‡ (3.4†)
Honor codes are an effective way to prevent cheating in optometry school.	36.2 (42.4)	38.2 (45.3)	4.04 (3.94)	1.80 (1.89)	3.8 (4.1†)	3.7† (3.9)	3.5‡ (3.7‡)	3.0‡ (3.2†)
Cheating is a normal outgrowth of the competitive nature of optometry school.	66.7 (62.9)	19.2 (29.7)	2.65 (3.02)	1.80 (2.00)	2.7 (3.1)	3.0‡ (3.1)	3.5‡ (3.4†)	4.2‡ (4.3†)
I would cheat if I were certain I would not get caught.	84.0 (88.7)	6.1 (5.4)	1.88 (1.72)	1.39 (1.32)	2.1‡ (2.0†)	2.3‡ (1.9†)	2.8‡ (2.4†)	3.5‡ (3.1†)
In the long run cheating doesn't really hurt anyone.	88.0 (89.8)	5.2 (5.8)	1.82 (1.79)	1.31 (1.35)	2.1‡ (1.9‡)	2.2‡ (1.9‡)	2.6‡ (2.2†	3.1‡ (2.7†)
Cheating is impossible to eliminate.	32.1 (33.2)	53.7 (59.3)	4.47 (4.48)	1.94 (1.93)	4.9† (4.7)	4.9‡ (4.8)	5.0† (5.0†)	5.6‡ (5.5†)
Someone accused of cheating is probably guilty.	57.1 (64.3)	12.9 (14.4)	3.01 (2.84)	1.97 (1.55)	3.0 (2.8)	3.0 (2.8)	3.1 (2.9)	3.2 (2.8)
Not a single exam goes by without someone cheating on it.	65.1 (42.6)	13.3 (32.4)	2.68 (3.70)	1.68 (1.81)	2.7 (3.8)	2.8† (3.8)	3.4‡ (4.1†)	4.4‡ (4.7†)
Cheaters just end up hurting themselves in the long run.	13.3 (19.5)	78.6 (74.0)	5.67 (5.40)	1.74 (1.93)	5.4† (5.3)	5.5 (5.3)	5.2 (5.2)	4.7† (5.1)
This college should do more to deter cheating.**	30.8	33.0	4.02	1.67	3.8	3.8	3.7	4.0
Behavior of an individual in school is an indication of what will happen with that individual when in practice.**	15.5	70.8	5.31	1.75	5.0	4.9†	4.5‡	4.1‡

*The students were asked to rate the attitude items on a seven-point Likert-type scale, ranging from 1, strongly disagree, to 7, strongly agree (with 4 indicating no opinion). In the table, percentages for "disagree" are of students who responded 1-3; percentages for "agree" are for students responding 5-7.

**Item not included in medical school survey.

†Cheaters differed from non-cheaters, $p < .001$; ‡ Cheaters differed from non-cheaters, $p < .01$.

Table 2

Types of Cheating Observed or Heard about at Least Once in Optometry School by 1,092 Second and Third-Year Students Compared with 2,459 Second-Year Medical Students. Medical school data is in parentheses.

	Percent of Students		
Type of Cheating	Who Observed	Who Heard About	Total
Copying answers during a test	14.7 (15.3)	29.5 (32.5)	44.2 (47.8)
Obtaining an unauthorized copy of a test prior to the time of the examination	14.8 (3.7)	18.8 (12.3)	33.6 (16.0)
Obtaining information about a test from others prior to the time of the exam	29.8 (15.7)	30.8 (28.3)	60.6 (44.0)
Providing false or misleading information during the application/admissions process*	2.3	6.3	8.6
Turning in a written assignment that was prepared by someone else	9.8 (14.1)	19.2 (16.9)	29.0 (31.0)
Moving labels or altering slides during a practical exam	1.4 (7.3)	4.0 (16.8)	5.4 (24.2)
Using a "cheat sheet" or "crib sheet" during an exam	3.7 (3.6)	14.5 (16.0)	18.2 (19.5)
Taking an exam for someone else	0.2 (0.6)	0.2 (2.1)	0.4 (2.7)
A student altering his/her grade in official records	0.2 (0.6)	0.2 (1.4)	0.4 (2.0)
Forging an instructor's signature on a clinical record form*	2.9	11.3	14.2
Falsifying findings on a clinical record form*	5.9	19.5	25.4
Substituting information from a previous patient visit for actual findings*	6.5	19.4	25.9
TOTAL WHO OBSERVED AND/OR HEARD OF AT LEAST ONE TYPE OF CHEATING	29.9 (39.0)	55.9 (66.5)	60.4 (77.2)

*Item not included in medical student survey.

report a cheating student to the proper authorities. One difference between the two groups is that fewer optometry students — 13.3% as opposed to 32.4% of the medical students — agreed with the statement that cheating occurs on every exam. Another area of difference is the attitudes about those caught cheating — 61 % of the optometry students thought that a student caught cheating should be dismissed while only 47.2% of the medical students held this belief.

Table 1 had three items not found on the medical survey. One of particular interest is that 70.8% of the optometry students felt that behaviors in optometry school are predictors of future practice behaviors. However, it is interesting that the item stating that the "college do more to deter cheating" had no clear agreement.

Perhaps this outcome verifies the similarity of responses between the two groups with most agreeing that cheating is impossible to eliminate. It is interesting to note that of those who chose to comment, many berated their faculty for not doing enough to deter cheating.

Table 1 also shows the attitudes of those students who admitted cheating. Those cheating in medical school were more likely to agree that cheating is impossible to eliminate and that every examination has someone cheating. Predictably cheaters are more likely to reject the concept that "cheaters hurt themselves in the long run" and that "anyone accused of cheating is probably guilty." These responses suggest that an attitudinal pattern exists allowing them to rationalize their own behaviors.

Table 2 shows a similar trend in types of cheating between students of the two disciplines (medical student results are in parentheses). In comparing copying answers during a test — the unethical student behavior most frequently cited by faculty — the two groups presented similar statistics. Optometric and medical students were also similar in the frequency with which they turned in a written assignment as their own that was actually prepared by someone else, using a "crib sheet" during a test, taking an exam for someone else and altering a grade on an official record. The relative overall infrequency of the latter two suggests either that security measures within the schools make this behavior quite difficult, or one could conjecture that the severity of the transgressions and possible recriminations discourages these behaviors. However, optometric students (Table 2) report a higher incidence of students receiving copies of tests (44.2% either personally observed or heard about this, versus 16% in the medical school study) and information pertaining to tests prior to an exam (60.6% personally observed or heard about this in optometry versus 44.0% from the medical school data).

Table 2 also represented additional questions that were added to the medical survey instrument. These clinic related behaviors have potential educational, research, and patient care implications: 5.9% of the optometric students reported observing the falsification of clinic findings and 6.5% the copying of the results of a previous patient visit to the more recent encounter, and in both cases three times as many heard about such behaviors. In a similar vein, 2.9% of the students observed and 11.3% heard about the forging of an instructor's signature on a clinic record form.

Table 3

Percentages of Male and Female Second and Third-year Students Who Reported That They Had Cheated during the Course of Their Education: 16 U.S. Optometry Schools 1997-98 Compared with Male and Female Second-Year Students: 31 U.S. Medical Schools, 1990-91. Medical school data is in parentheses.

	Percent			Ratio of
Time of Cheating	Men	Women	Total	Women to Men
Optometry	(n= 474)	(n= 595)	(n=1,070)	
Medicine	(n=1,510)	(n= 916)	(n=2,426)	
During junior high school	33.8 (36.1)	18.8 (23.8)	25.5 (31.4)	.56 (.66)
During high school	39.4 (46.8)	23.0 (30.2)	30.2 (40.5)	.58 (.65)
During college	18.1 (19.2)	10.6 (11.9)	13.9 (16.5)	.59 (.62)
During optometry school	7.7 (5.1)	3.7 (4.0)	5.5 (4.7)	.48 (.78)

Note: The total numbers of men and women in both studies is less than the total number of survey respondents shown in Tables 1 and 2 because a number of students did not indicate their gender.

Table 3 shows the percentage of those students whose self-reported cheating totaled 5.5% of the optometric students consisting of 7.7% of the males and 3.7% of the females. These can be compared to Baldwin's total of 4.7%,of the medical students of which 5.1% were males and 4.0% females. While both surveys showed a gender difference, it was more pronounced in optometry. It is also interesting to note that in both surveys, as well as another survey reported by Dans previous cheaters are more likely to cheat in professional school.[4] There is a pattern of dishonest behavior for those who report cheating in professional school. They are more likely to have cheated in junior high school, high school, and college prior to professional school. Two-thirds of those who reported cheating in optometry school also admitted to cheating from junior high school on.

The existence of an honor code is consistent with less student cheating; 9.1% of the optometric students who cheated reported that their schools did not have an honor code, while approximately one-half that number (4.5%) said their school had an honor code. Of those not certain about the existence of an honor code, 5.7% admitted cheating. These results parallel those of Baldwin, who reported that where there was an honor code in medical schools, 3.8% of the students cheated, where there was no honor code, 7.7% reported cheating.

In Table 1 we also compared the mean of the attitudes of those students who admitted unethical behaviors with the mean of the entire population surveyed. Their results differed from the others in every item except that the school should do more to deter cheating. It is not surprising to note that the results of those who admitting cheating predictably were consistent with rationalizing their behaviors.

Discussion and Recommendations

In addition to those students who chose not to complete the forms, the response rate was affected by the different academic calendars and student schedules at the optometry schools. Some students were assigned to off-campus sites and not available to participate. Obviously, there is no way of guessing the findings of those who do not respond.

It is interesting to observe the similar results among optometric and medical students in spite of several differences noted earlier.

The results suggest that both disciplines are drawing from students with similar ethical frameworks. The likelihood that those who cheat in professional school will be dishonest professionals may be true if we consider the pattern of dishonesty that is apparent throughout their schooling.

An issue that was particularly disturbing is the extension of dishonest behaviors to patient care. In this study, approximately 25% of the students observed or heard about dishonesty concerning clinical findings. This relationship has also been reported elsewhere with similar results. Dans wrote that within his medical school population 24% of a graduating class admitted cheating in direct patient care.[4] Sierles also reported highly significant correlations between cheating in medical school and falsification of patient record data.[5] This present study also revealed that 14.2% of the optometry responders were aware of the forging of an instructor's signature on a clinical record form. Since this study did not attempt to poll optometric practitioners, the relationship between cheating in professional school and later in practice remains conjectural. It is interesting to note that in writing about academic dishonesty, Schiming considers academic dishonesty as addictive activity.[8]

The apparent effectiveness of an institutional honor code is inconsistent with the student attitudes expressed in Table 1 in which both optometry and medical students were evenly divided as to whether they felt that an honor code prevents cheating. Our study indicated that the existence, and student awareness, of an honor code seems to result in less unethical behavior. This is consistent with the opinion of Derek Bok who has written that the honor code may be the most effective approach in matters of academic integrity.[9] McCabe and Trevino feel that the relative effectiveness of such a code depends upon how it is developed and implemented. They also indicated that the certainty of being reported and severity of the penalty inhibits cheating.[10]

The results of this reported study would lead to the recommendation that schools without such a code develop one, and those with one publicize it to their students, since 27.3% of our responders did not know whether an honor code existed at their schools.

This study revealed that the incidence of students altering grades is quite low. However, the optometry schools need to reduce the opportunity for students to receive unauthorized copies of tests before the examination. Professors who utilize previous tests or repeat test questions add to this problem as students are sufficiently organized to assign specific questions for memorization for the files of future

classes. It is interesting to note that this item caused the most student confusion. Some students commented that only if the test has been taken from the professor's possession does it qualify as an "unauthorized copy." Test questions within the files of the students are from unknown origins so they could not determine whether they were authorized or unauthorized. This gray area can be reduced or eliminated with the distribution of tests to the student body after their utilization. This process gives each student equal access to this information.

Staggered seating, multiple test variations, and changing testing strategies can diminish the copying of answers from a neighbor. While substitute test takers are rare in optometry (and medicine), the submission of materials written by someone else is not (29% either saw or heard about this in optometry school and 31% in medical school.) This defies a simple solution as the pool of materials in this category increases with writing services, e-mail, Internet, more efficient student organization, etc.[7] Course requirements of "original" student papers or research should take this potential into account.

Schools must react to the dishonesty that relates to patient care. There is no solace in knowing that the numbers in optometry are similar to those in medicine. Such dishonest behaviors speak to student supervision and quality assurance issues. It also seriously imperils the integrity of retrospective clinical research, which uses clinical records.

It is not a major step for students who do not respect the sanctity of patient records while in school to continue dishonest behaviors relating to patient care after graduating. One recent publication concerning physicians' observations of unethical behaviors during their residencies reported that 44.5% personally observed falsifications of medical records.[11]

There seems to be general agreement that all cheating cannot be eliminated. Theoretically, it would help to reduce cheating if we were able to objectively discourage dishonest applicants. However, the methodology of doing this with confidence is non-existent.

An important beginning is that students must believe that their institutions are committed to ethical behaviors within the entire institutional community.

In this paper students from two health care disciplines were compared and the findings were quite similar. Students who choose to be a health care provider may be ethically similar to each other. It may be interesting to observe in the future the effect of the increasing numbers of females entering our schools and professions. Will the reduced level of dishonesty on the part of females found in these two studies result in a generalized downward trend of cheating in the future? In spite of the higher percentage of females in the optometric study, the prevalence of self-reported cheating was slightly higher than in the medical study.

It is essential that optometric students, faculty, and administrators be aware of these issues and react together in such a fashion as to reduce unethical behaviors.

Acknowledgement

*The authors wish to thank Dr. Baldwin and the journal *Academic Medicine* for permission to reproduce their tables.

Baldwin Jr DW C, Daugherty SR, Rowley BD, and Schwartz MR. Cheating in medical school: A survey of second-year students at 31 medical schools. Acad. Med 1996 Mar; 71(3)269,270,271.

References

1. USA Today, Nov 12,1997, Lifeline, p 1.
2. Baldwin Jr DW C, Daugherty SR, Rowley BD, and Schwartz MR. Cheating in medical school: A survey of second-year students at 31 schools. Acad Med. 1996 Mar;71(3):267-273.
3. Satterwhite WM III, Satterwhite MA, Enarson CE. Medical students' perceptions of unethical conduct at one medical school. Acad Med. 1998 May; 73(5)529-531.
4. Dans PE. Self-reported cheating by students at one medical school. Acad. Med. 1996, 71(1)S70-S72.
5. Sierles F, Hendrickx I, and Circle S. Cheating in medical schools. J Med Ed. 1980; 55 124-5.
6. Bilge A, Shugerman RP, Robertson WO. Misrepresentation of authorship by applicants to pediatrics training programs. Acad Med 1998 May;73(5)532-3.
7. Fishbein L. We can curb college cheating. March 1994, The Education Digest, Mar 1994;58-61.
8. Schiming, RC. Academic Dishonesty. [Online]. Available: http:www.mankato.msus.edu/dept/cenffd/Cheath,html [Nov 11,1997]
9. Bok D. Universities and the Future of America. No. Carolina, Duke University Press, 1990,p.87.
10 McCabe DL and Trevino LK. Academic Dishonesty,J. Of Higher Education, Sept/Oct 1993; 64(5)522-538.
11. Baldwin DC, Daugherty SR, Rowley BD. Unethical and unprofessional conduct observed by residents during their first year of training. Acad. Med. Nov 1989;73(11) 1195-1200.

Editorial

(Continued from page 68)

them. So if lay persons can understand us, why do we as faculty remain so reticent about when to introduce our students to clinical practice settings? Our students decided to become optometrists in most cases because they learned about the profession through a practitioner role model. It only makes sense to me to build upon that foundation by providing them with early clinical experiences as part of their professional edcuation.

Many of the schools and colleges of optometry are currently assessing instructional methodologies and the delivery of their curriculum. Curricula will change as faculty refine their thinking about entry level and experiential competencies. What changes lie ahead for the clinical curricula? As part of the process of curriculum reform, faculty should think about a curriculum that prepares graduates for the independent practice of optometry. Part of that design ought to include jump starting student thinking so that the qualities and characteristics of a clinician are acquired as soon as possible.

Adapting successful curriculum models from other professions, especially those that have been shown to yield positive outcomes, is one of several options available to faculty who are actively engaged in curriculum reform. The College of Osteopathic Medicine at Nova Southeastern University and other medical schools have concluded that early exposure to clinical care and physician role models has a positive educational impact on their students. Exposing our students to early clinical experiences sounds like a good curriculum initiative to me.

References

1. Nova Southeastern University. College of Osteopathic Medicine. Department of Interdisciplinary Generalist Curriculum (IGC) Program. http://www.hpd.nova.edu/ostmed/academics/igc/igc.htm
2. Lubetkin EI, Schmidt H, Charon R. Risks and benefits of early clinical exposure [letter]. Acad Med 1999;74(11): 1153.
3. Kossoff EH, Hubbard TW, Gowen CW. Early clinical experience enhances thrid-year pediatrics clerkship performance. Acad Med 1999;74: 1238-1241.

The Effectiveness Of a Patient Communication Course

Harue J. Marsden, O.D., M.S.

Abstract

Background: Many schools and colleges of optometry have implemented patient communication courses into their curricula. Communication styles of patients may differ from those of the optometry student. The standardizing of communication responses can minimize differences in communication manners. This study reports data from three consecutive classes of first year optometry students, preceding and following completion of a patient communication course. Methods: The students were evaluated based on a communication index score and a discrimination index score. The communication index requires that the students respond to three emotionally-charged predicaments. The discrimination index tests the student's ability to identify types of psychological counseling or empathetic responses. Results: The 95% confidence interval for the estimated mean change is (2.72, 3.03) for the communication index and (-3.56, -2.91) for the discrimination index. Conclusions: These findings indicate that students are able to improve their ability to respond and are better able to discriminate among various levels of responses after completing this patient communication course.

Key Words: patient communication, communication index, discrimination index, communication responding levels

Introduction

Communication is the manner of exchanging information using a mutual set of rules.[1] Breakdown in communication occurs when individuals have different interpretations of the rules. There are few guidelines in health care communication that are universal. Health care providers will utilize skills with which they are familiar. This may be inadequate if their patient population uses different communication styles from their own.[2-4] It is difficult to teach students what to say, without sounding inappropriate or scripted. The communication course at the Southern California College of Optometry teaches students how to empathetically respond to an emotionally-charged situation, which may occur with an angry, distraught or upset patient.

Developing a communication course to aid the doctor or student to improve interpersonal communication skills can be challenging. Most courses merge the teaching of medical interviewing and relationship development.[5] Since the medical interview or case history is the first opportunity for the doctor to develop a relationship with the patient, it is logical to link the two skills. It is important that appropriate communication not be diluted by the skill of asking questions. Communication, technical skill and clinical decision making all contribute to the delivery of quality health care.

In the assessment of quality assurance in health care, patient satisfaction surveys highlight the importance of communications skills of the health care provider.[6] Many health care educational institutions have implemented patient communication courses into their curricula. The content of these courses varies from institution to institution, depending on the course objectives. Simulated patients have been useful in assessing the communication skills of student doctors.[7] However, it is challenging to teach the student clinician appropriate skills when dealing with difficult situations like delivering bad news or dealing with an angry patient.[8-11] Differences between the patients' and doctors' communication styles can hinder the relationship between the health care provider and the patient. These differences may be attributed to many factors including the location of the clinical site (urban vs. rural), the practice mode of the site (hospital based vs. Indian Health Service) or even cultural communication differences.

At the Southern California College of Optometry (SCCO), a patient communications course was first introduced in 1987. Similar to that used at other colleges of optometry, this course integrates the elements of a case history with appropriate verbal and nonverbal communication skills. In addition this course teaches the optometry student how to respond to emotionally-charged situations. A psychological model of responding is utilized to teach the optometry student to identify the feeling or emotion and the content or reason behind that feeling.[8-11] When the clinician responds with a statement that identifies feeling and content, the patient recognizes that the doctor is listening and empathizes with the patient's perspective. This helps to establish a trusting relationship between the patient and the doctor.

Inappropriate verbal responses are often given by students in situations

Dr. Marsden is an associate professor at the Southern California College of Optometry (SCCO). Her primary clinical responsibility is in the Cornea and Contact Lens Service at the Optonetric Center of Fullerton. She has provided international lectures, publications and research in the areas of patient communication, orthokeratology, contact lens management of post-surgical cornea and laboratory testing.

where a patient has disclosed experiences of domestic abuse or a clinician has delivered devastating news to the patient. An inappropriate response can be a statement that negates what the patient has said or avoidance of the subject altogether. The response that is given by the student-doctor is important for the patient's psychological well-being. Stating the patient's emotion and reason for the emotion has been described by van Servellen as therapeutic communication.[12] Responding in this manner creates a comfort level between the doctor and patient so that the patient will trust and confide in the doctor.

The development of close relationships between the doctor and patient reduces intense emotional distress and offers support and reassurance. Patients are not always able to assess the doctor's technical skills; however, if the rapport between a patient and doctor is poor, the patient's comfort with and confidence in the doctor becomes diminished. Miscommunication can arise that can result in patient loss or even litigation.

The communication course at SCCO utilizes a four-step psychological response model to address the emotion expressed by the patient. The student is instructed to identify the general mood of the emotion (positive or negative). Next, the specific category is selected (happy, sad, angry, scared or confused). The intensity level then helps to narrow down the appropriate "feeling" of the emotion (high, moderate or low).[9] Finally the student chooses a vocabulary word that fulfills the three previous categories. To conclude the response, the student must determine the reason for the "feeling" or emotion being expressed.[9,10,13] This study evaluates the effectiveness of this particular communication course in teaching the optometry student to identify emotions or feelings expressed by a patient, the content or reason for the emotion, as well as how to respond to an emotionally-charged situation.

Methods

Three consecutive first year optometry classes (1993, 1994 and 1995) at SCCO were given communication and discrimination index tests prior to their first lecture, and then again upon completion of the Human Relations Development course. The communication index consists of three emotionally-charged scenarios in which students are asked how they would respond. This test is graded using a 3.0 to 1.0 responding scale.[9,10] If the student gives a 3.0 response, the person's feeling and reason for the feeling (content) have been identified properly. A 2.5 response identifies feeling only, and a 2.0 identifies content only. The 1.5 response (usually the most common response) is one in which the student asks a question or gives advice to the person. A 1.0 response implies that feeling and content are missing. This grading scale yields a minimum score for this test of 3.0 and a maximum score of 9.0.

An example of an emotionally-charged scenario would be when a patient makes a statement such as, "This is the third time I have had to come in for an office visit in the past month! Why can't you people get my prescription right?" A 1.0 response would be "too bad" and a 1.5 response would be a question such as "exactly what is the problem?" or advice such as "why don't you try tilting your glasses a little?" A 2.0 response would be "I'm sorry we can't get your glasses right" (content only), and a 2.5 response would be "that must be frustrating" (feeling only). An appropriate 3.0 response could be "You feel frustrated because we can't get your prescription right and you've had to return so often" (feeling and content).

Upon completion of the communication index, the student is given the responding scale mentioned above. The students are asked to discriminate responses to scenarios similar to the example above. The discrimination index consists of five excerpts with four responses to each excerpt. The student's task is to discriminate what response level was given (1.0, 1.5, 2.0, 2.5 or 3.0) for each excerpt. The grading of the discrimination index is based on the deviation from the actual response. For example, if the actual response was 2.5, and the student identified it as 2.5, a zero point value is given. However, if the student identified it as a 2.0 or 3.0 response, a 0.5 point value is given. Using this grading scale, a perfect score is 0.0 and the maximum score is 32 points.

Results

The mean test scores and standard deviations for each class are summarized in Table 1. The cumulative total for the communication index has an average pre-communication course test score of 5.72 ± 1.07 std. dev. (perfect score 9, minimum score 3). The discrimination index has an average pre-course score of 9.28 ± 2.42 std. dev. (perfect score 0, maximum score 32). Post-course scores are 8.58 ± 0.74 and 6.05 ± 2.19 for communication and discrimination index tests respectively (Table 2). The 95% confidence interval for the estimated mean change is (2.72, 3.03) on the communication index and (-3.56, -2.91) on the discrimination index (Table 3). These results reflect

Table 1

Test	Communication Index		Discrimination Index	
Year	Pre	Post	Pre	Post
1993	5.91 ± 1.13	8.55 ± 0.76	9.00 ± 2.41	5.92 ± 2.11
1994	5.56 ± 1.06	8.46 ± 0.79	8.88 ± 2.78	6.08 ± 2.32
1995	5.59 ± 1.00	8.71 ± 0.66	9.94 ± 1.84	6.12 ± 2.15

Table 2

Cumulative scores:

Communication Index		Discrimination Index	
Pre	Post	Pre	Post
5.72 ± 1.07	8.58 ± 0.74	9.28 ± 2.42	6.05 ± 2.19

Table 3

95% Confidence Interval for the estimated mean change:

Communication Index (2.72, 3.03)
(min. 3.0, max. 9.0)

Discrimination Index **(-3.56, -2.91)**
(perfect 0.0, max. 32.0)

improved performance on the communication and discrimination index of nearly three points for each test.

Discussion

With few universal guidelines in health care communication, the doctors use skills with which they are familiar in establishing the doctor-patient relationship. This style of communication may be inappropriate if the patient population uses a different communication style from the doctor. The four-step psychological response model addresses the emotion expressed by the patient and the reason for the "feeling" or emotion being expressed.

By responding to the patient with "You feel _____ because _____," the student expresses his or her understanding of the emotion and reason for the emotion. This response phrase is merely a template, and emphasis is placed on developing a natural style that expresses the emotion and meaning or reason for the feeling. An example of a natural style for the earlier predicament could be "Returning to our clinic so frequently can be frustrating." The next step would be to address the problem. One of the objectives of the communication course is for the student to respond or communicate at a level 3.0 as well as to identify and discriminate a level 3.0 response. This response lets the patient recognize that the student doctor identifies what the patient is feeling and the reason for the feeling or emotions.

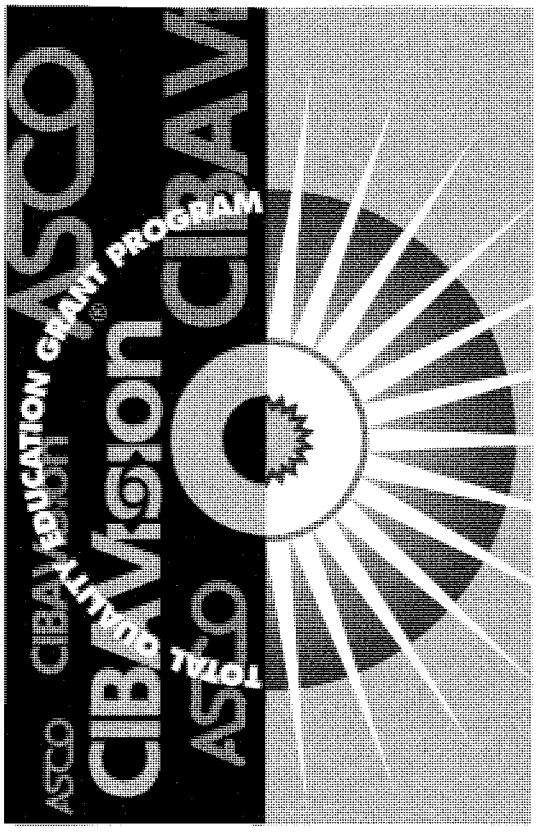
This type of verbal response can be expanded into conflict management when dealing with difficult patient scenarios as well as the delivery of bad news. In communications dealing with conflict or sorrow, avoidance eases the discomfort an individual experiences in these situations. The 3.0 response does not eliminate the uncomfortable situation; however it does provide a simple reply that puts the patient at ease. In addition to non-verbal communication skills, good responding and listening skills can be utilized by the eye care provider and are important in developing good doctor-patient rapport.[14, 15]

This study demonstrates that following a ten-week communication course, the students communication index test scores improved approximately three points out of nine. On the discrimination index test, the students improved in their ability to discriminate response levels by approximately three points. In medical education, it has been demonstrated that communication skills of students improve following training.[16, 17] Another study on the effectiveness of a communication course at the Illinois College of Optometry demonstrated that the student's increased awareness of the patient's emotional well-being resulted in a greater likelihood to respond with empathy.[18] The awareness of appropriate types of responses improves the student's ability to respond to emotionally charged situations.

Although this study evaluates the student's written ability to respond or discriminate a response, the next level would be to determine how the student doctor responds to an actual clinical situation with a real patient. The delivery of bad news can be very difficult, and the appropriate response is helpful to alleviate the emotional distress.[19] This can be difficult to evaluate in many clinical settings. Videotaping the case history of second year optometry students at the Pennsylvania College of Optometry has demonstrated increased awareness by the student clinician of the patient's emotional well being. However, clinical performance was not found to be significantly different between students who were and were not videotaped.[20] An additional study to evaluate the retention of these skills years after completion of the course could be beneficial. The effectiveness of communication skills has its main impact on the ability of students or doctors to communicate effectively with their patients. One means of assessing this is through patient satisfaction. By using these communication guidelines the student has a clearer understanding of how to respond in an emotionally-charged situation in a rapid and effective manner.

References

1. Northouse PG, Northouse LL. An introduction to health communication. In: Northouse PG, Northouse LL, eds. Health Communication Strategies for Health Professionals, 2nd ed. Norwalk, CT: Appleton & Lange, 1985:2-4.
2. Cormier LS, Cormier WH, Weisser EJ. Listening to patients. In: Cormier LS, Cormier WH, Weisser EJ, eds. Interviewing and Helping Skills for Health Professionals. Belmont, CA: Jones and Bartlett Publishers, 1986: 88-105.
3. Crisp AH, Edwards WJ. Communication in medical practice across ethnic boundries. Postgraduate Medical Journal 1989, Mar;65:150-155.
4. van Servellen G. Cultural differences and communication. In: van Servellen G ed. Communication Skills for the Health Care Professional. Concepts and Techniques. Gaithersburg, MD: Aspen Publishers, 1997: 48-63.
5. Dickson DA, Hargie O, Morrow NC. Evaluation of communication skills training. In: Dickson DA, Hargie O, Morrow NC. eds. Communication Skills Training for Health Professionals. An instructor's handbook. London: Chapman and Hall Ltd., 1989: 249-274.
6. Brown SW, Nelson AM, Bronkesh SJ, Wood SD. Patient satisfaction does pay. In: Patient Satisfaction Pays. Quality Service for Practice Success, Gaithersburg, MD: Aspen Publishers, 1993: 3-9.
7. Finlay IG, Stott NCH, Kinnersley P. The assessment of communications skills in palliative medicine: a comparison of the scores of examiners and simulated patients. Medical Education 1995, Nov;29:424-429.
8. Brown SW, Nelson AM, Bronkesh SJ, Wood SD. Can we talk? In: Brown SW, Nelson AM, Bronkesh SJ, Wood SD. eds. Patient Satisfaction Pays. Quality Service for Practice Success, Gaithersburg, MD: Aspen Publishers, 1993:255-263.
9. Gazda GM, Childers WC, Walters RP. Interpersonal Communication, Rockville, MD: Aspen Publishers, 1982:67-123.
10. Dickson DA, Hargie O, Morrow NC. Responding skills. In: Dickson DA, Hargie O, Morrow NC. eds. Communication Skills Training for Health Professionals. An instructor's handbook. London: Chapman and Hall Ltd., 1989:69-99.
11. Muldary TW. Alternative perceptions: Toward empathic understanding. In: Interpersonal Relations for Health Professionals, New York: Macmillan Publishing, 1983: 96-119.
12. van Servellen G. The nature of therapeutic communications. In: van Servellen G. ed. Communication Skills for the Health Care Professional. Concepts and Techniques. Gaithersburg, MD: Aspen Publishers, 1997: 29-47.
13. Anthony WA, Carkhuff RR. Responding. In: Anthony WA, Carkhuff RR. eds. The Art of Health Care: A Handbook of Psychological First Aid Skills. Amherst, MA: Human Resource Development Press, 1985: 25-39.
14. Tubbs SL, Moss S. The non-verbal message. In: Tubbs SL, Moss S. eds. Human Communication, 6th ed. New York: McGraw-Hill, 1991:135-171.
15. Ettinger ER. Professional Communications in Eye Care. Stoneham, MA: Butterworth-Heinemann, 1994: 1-5.
16. Greenburg SL. The effect of an interpersonal skills training course on interviewing skills, empathy, and assertion in fourth-year optometry students. Ann Arbor, MI: University Microfilms International,1980.
17. Wolf FM, Woolliscroft JO, Calhoun JG, Boxer GJ. A controlled experiment in teaching students to respond to patients' emotional concerns. J of Medical Education 1987, Jan;62:25-34.
18. Monohan DJ, Grover PL, Kavey REW, et.al. Evaluation of a communication skills course for second-year medical students. J of Medical Education, May;63(5):372-378.
19. Klein SD, Klein RE. Delivering bad news: the most challenging task in patient education, J of Am Optom Assoc, Aug;58(8):660-663.
20. Marren SE. Videotape viewing behaviors of second year optometry students. J Optom Educ 1995, Spring;20(3):89-93.



Training the Trainer: Developing Educators For Continuing Professional Education

Harriette Canellos, O.D.
Franklin J. Medio, Ph.D
Rochelle Mozlin, O.D.
Claudia A. Perry, Ph.D.

Abstract

Given the rapid changes in the health care arena and the vastly expanded scope of practice in optometry, clinicians are legally and ethically bound to stay current with new developments and to upgrade their knowledge base. This situation creates a demand for qualified continuing professional education instructors. We developed a program at the State University of New York College of Optometry targeted at training younger clinical faculty who wish to become involved in continuing professional education. This paper describes the program's purpose and our experiences with its implementation.

Key words: *Continuing professional education, adult learning principles*

Dr. Canellos is a full time assistant clinical professor at SUNY College of Optometry and works primarily in the primary care clinics. Dr. Medio is the director, Office of Graduate Medical Education, and an associate professor of internal medicine at the Medical University of South Carolina. Dr. Mozlin works primarily in the pediatrics and vision therapy services at SUNY. Dr. Perry is the assistant dean of information services at SUNY where she oversees academic computing, the library and media resources and teaches a course in literature evaluation.

Introduction

The responsibilities of schools and colleges of optometry include not only the traditional missions of research, patient care, service, and the education of students, but also an increasingly important challenge to provide opportunities for a high quality continuing education to doctors. Given the rapid changes in the health care arena and the vastly expanded scope of practice in optometry, clinicians are legally and ethically bound to stay current with new developments and to upgrade their knowledge base. This situation creates a demand for qualified continuing professional education (CPE) instructors who possess both the requisite knowledge base and the teaching skills to convey that information to other optometrists. This goal is challenging on a number of fronts.

The process of designing and administrating a CPE program necessitates many considerations. For instance, at least at the SUNY College of Optometry, programs tend to depend heavily on senior faculty who are likely to be over committed and extremely busy. Often, such experts have both didactic and clinical teaching responsibilities in the professional program, as well as administrative responsibilities. Scheduling difficulties create problems both for the potential instructors and the coordinators of such programs, not to mention placing substantial stress on instructors to prepare and travel to distant sites in order to deliver their lectures. Such a heavy reliance on a few individuals places stress not only on the institution's instructors, but on their overworked colleagues as well.

Interestingly, other sources of CPE instructors include experienced clinicians or clinical faculty who may lack substantial didactic teaching experience. Although possessing the necessary clinical knowledge base, they may not know how best to convey that knowledge to others in a structured conceptual format[1]. Even didactic instructors may have difficulty distilling the essence of a semester long course into a two-hour lecture. Furthermore, the needs and motivations of adult learners with years of professional experience are quite different from those of full-time traditional students. Conveying essential concepts and providing an appropriate context to a varied audience of strangers in an hour or two can be far more challenging than teaching professional students in the standard semester-long course.

In examining these difficulties, we arrived at a potential solution: offer targeted training to less experienced clini-

cal faculty who may wish to become involved in Continuing Professional Education. In addition, this type of faculty development program can be of value to current CPE lecturers who seek to improve their lecture skills for this specialized setting.

As the primary "customers" for the program, junior faculty gain the opportunity to develop their presentation skills, to showcase their talents to a broader audience, to enhance their curriculum vitae, and to interact closely with potential role models. This diversity of teaching experience is likely to have a positive impact on other aspects of their teaching role as well. More experienced faculty have an opportunity to reflect consciously on their own teaching, and to experiment with possible alternative approaches to the traditional lecture format. And both groups stand to gain from the insights of an outside consultant experienced in offering specialized training to educators in the health professions.

Targeting Adult Learners

Traditional CPE lectures are usually pedagogical (i.e. a lecture format geared toward a passive learner), with emphasis on the presentation of large amounts of information in limited amounts of time[3]. There is typically little input from the "customer." Although well organized, such lecturers often fail to convey the conceptual framework necessary to help the learners retain the information. Doctors may return to their practices with an expanded knowledge base but limited ability to transfer this knowledge to patient care[4]. The pedagogical model can be contrasted with a more active adult learner model[5].

The elements of the adult learning model (or andragogy), as articulated by Knowles, rely on assumptions regarding self-concept, life experience, readiness to learn, and orientation to learning. The adult learner is viewed as self-directed, with a problem-centered orientation to learning. The individual's reservoir of life experience acts as a rich resource, and provides a broad base to relate to new knowledge. "Active" modes of learning such as discussion, simulation and field experience are seen as particularly effective techniques for stimulating learning. And finally, timing is viewed as critical. Individuals will be more ready to learn when confronting problems or topics they perceive to be directly relevant to their present needs.

The adult learning model has been the focus of the Peer Review Instructional Improvement Program, which was funded by a previous Total Quality of Education (TQE) grant. The training process for peer reviewers had two essential components. First, these faculty members developed a knowledge of the adult learner model. Second, they received training in the application of these principles to a review process. A Lecture Skills Assessment Form (see Figure 1) utilized by both the reviewer and the reviewee reinforces the need to assess and encourage the utilization of these adult learning principles in the didactic education of our professional students. The current program builds on this foundation by applying these principles and their assessment to continuing professional education.

Our "Training the Trainer" program focused on the principles of adult learning as described above. Faculty participants were taught learner-centered teaching methods that can be utilized in large group settings. Emphasis was on utilizing clinical scenarios in order to:

1) establish a common base for all CPE participants;
2) present a conceptual framework, which is easier for adult learners to assimilate;
3) anchor instruction in case presentations to maximize transfer to clinical practice;
4) stimulate greater interaction between participants and the instructor as well as among the participants;
5) develop techniques to immediately assess understanding and comprehension of material; and
6) promote lifelong learning by providing additional learning activities and/or resources.

The Project

A consultant (FM), who had worked with the college on the peer review program previously described, provided instruction and guidance on the project. An initial one-day training program was divided into two parts: 1) a group session in the morning discussing concepts, principles and techniques; and 2) a hands-on practice session in the afternoon using the micro-teaching method.

The morning session focused on the advantages of incorporating the adult learning model (i.e., andragogy) into didactic presentations. Common traps and pitfalls of didactic presentations were identified along with strategies to avoid them. Techniques were presented that can be used to:

a) stimulate audience participation, especially in a large group, b) increase comprehension and understanding of information, c) improve retention of material and d) stimulate continued learning after a presentation. The seven participants involved in this project were primarily junior faculty, with several senior faculty serving as facilitators and project coordinators.

The afternoon session began with a refresher course for the two faculty members who served as the facilitators for the micro-teaching session. During this time the participants were preparing their presentation for the micro-teaching session (the facilitators are individuals who completed the "Peer Reviewer" training program mentioned earlier). The refresher course reviewed the concepts and principles presented in the morning and the roles and responsibilities of the facilitator. Following this session, each facilitator was assigned to a group of participants.

In the micro-teaching session, each participant made a 15-minute didactic presentation incorporating the concepts, principles and techniques from the morning session. At the end of each presentation, the facilitator led a 15-minute review/critique of the person's performance. A presentation skills checklist, (a modified version of the one designed for the Peer Review Project) was used as a guide for the review/critique. These sessions were useful not just as a means of providing feedback to each presenter, but also for providing peer support and encouragement. Participants, whether presenting, critiquing or observing, had a valuable opportunity to learn from one an another in a supportive environment.

At the conclusion of the micro-teaching session, the participants received their instruction for the take home assignment. This assignment was to prepare a 50-minute interactive presentation (complete with audiovisual materials), which incorporated the adult learning model that they had been exposed to in the training program. The selection of the presentation's topic and content was left to each faculty member, but they were

strongly encouraged to select one that they plan to present at a CPE program.

During the next several months, participants were videotaped giving their presentations to either an actual CPE group or a mock CPE group (participants and facilitators from this program). Each person received a copy of his/her own videotape for review, as did the facilitator from the micro-teaching session. A meeting between each participant and a facilitator was held to review their performance. The Lecture Skills Assessment Form was used as an evaluation guide (see Figure 1).

A follow-up one-day program was conducted with the participants and the facilitators at the conclusion of the project. The first part of the program was a general discussion of the participants' experiences when they made their CPE presentations. The discussion focused on the audience responses to the interactive presentation and also provided an opportunity to discuss any problems, concerns or issues. The second half of the program involved individual meetings with the project consultant.

Participants' Experiences

During the group discussion portion of the follow-up session, a number of themes emerged. As novice presenters, the project participants shared many similar experiences in terms of instructional challenges. The handling of questions, and follow-up to interactive activities, were a particular target of discussion, prompting inquiries such as the following:

- How long should one wait for a response?
- How does one include everyone in discussions and avoid a few individuals dominating?
- After an interactive interlude, how does one resume the flow of the lecture?
- How does one remember when to stop to ask questions?

It was reassuring to be reminded that most people are uncomfortable with silences; that while it might seem like forever, one's perceptions of waiting for a reply tend to be distorted. Helpful instructional tips included:

- Let the group know up front that you expect participation.
- To minimize discomfort with questions, have audience members briefly discuss options with their neighbors before asking for responses.
- Try asking for a show of hands to an array of possible answers.
- Five seconds is a reasonable time to wait for an answer.
- An effective instructor learns how to switch back and forth between roles, at times teacher-centered, at times learner-centered.

Perhaps the key take-home point of the day was emphasizing that how you teach affects not only what your audience learns, but also their learning habits. As CPE instructors, we want to point our students in the right direction, provide feedback, and inculcate an internal desire to improve, but most of all, we want to teach them to be assertive learners. The experience of engaging in the CPE project did much to lay the groundwork for the development of teaching skills to support such a perspective.

What Worked? What Caused Problems?

In one-on-one interviews during the follow-up portion of the project, both facilitators and participants were very positive regarding their experiences. Participants stressed how valuable they found the self-review of the presentation videotapes, independent of the value of the personalized critique by peer reviewers (which also was very well received). The opportunity to see oneself in "action" while intimidating, was immensely powerful in terms of its capacity to identify problem areas and points of strength. For example, it was illuminating to see that the pause while waiting for responses to questions was not nearly as long as it appeared to be while making the presentation. During the group session, in fact, it would have been useful to be able to review short portions of selected tapes to illustrate key discussion points. Alternatively, it could be useful for larger groups to review the tapes rather than just the presenter and the facilitator.

Both participants in the follow-up session and those who were unable to attend were contacted to determine how many of them submitted proposals for and delivered continuing professional lectures. All but one of the participants involved in the project actually delivered one or more CPE lectures within one year of the project's initiation.

Although the project was extremely well received, it was not without problems. One disadvantage was that the number of doctors involved in the program was much lower than expected, primarily because of scheduling difficulties. Clinical faculty members are heavily scheduled, often at external clinics and on staggered days of the week. Finding a single day that all interested parties could be present at the same time was extremely challenging, and some potential attendees could not be accommodated because of these difficulties. In addition, two of the seven participants left SUNY during the year-long project and consequently did not complete the program. Such a turnover of junior clinical faculty is perhaps not surprising, but it does contribute to the difficulty of building an ongoing faculty development program.

Nonetheless, the obligation to fulfill the terms of the TQE grant was important for justifying release time for participants. One can speculate that without such grant funding, even fewer doctors would have been able to participate. The involvement of an outside consultant was similarly valuable in ensuring that the project didn't get off track. Finally, the more formal structure of this funded program encouraged ongoing participation and a sense of continuity with earlier initiatives. This led to a more integrated learning experience for participants than would be obtained with a series of discrete, stand-alone workshops.

Other Benefits

The project yielded a number of benefits beyond encouraging the development of skills relating to the delivery of quality CPE. For junior faculty, the project provided an important opportunity to develop the self-confidence required for public speaking. The decision to build on prior TQE grant projects allowed previous participants to update and reinforce their peer review skills, and to shine in a leadership role. Sharing the responsibilities of coordinating the project gave several faculty members the opportunity to further develop their administrative skills.

The overview of adult learning principles was valuable not just for participating junior clinical faculty but also as a refresher for facilitators and project coordinators. Discussion at the group follow-up session was

Figure 1

LECTURE SKILLS ASSESSMENT FORM: PART I

SKILLS	COMMENTS
Opening	
Introduces self (qualification/experience)& states purpose	
Captures interest and explains relevance of lecture	
States learning objectives	
Outlines topics and organization of presentation	
Provides source for the information presented	
BODY—Presentation	
Presents material in easy-to-follow manner	
Presents an appropriate amount of information	
Encourages participation and interaction	
Uses quality audio-visual aids appropriately	
Uses transition statements to bridge different topics	
Presents "animated" style with appropriate eye contact	
BODY—Content	
Denotes controversial areas in material presented	
Cites references/sources for recent developments	
Uses audio-visual aids to enhance understanding	
Checks for student comprehension	
CLOSURE	
Concludes with a summary of important points	
Relates presentation to other learning activities	
OVERALL IMPRESSION OF LECTURE	

LECTURE SKILLS ASSESSMENT FORM: PART II

STRENGTHS: _____

PRESCRIPTION FOR IMPROVEMENT: _____

SUGGESTED READINGS & RESOURCES: _____

FACULTY MEMBER (Printed)	FACULTY REVIEWER (Printed)
FACULTY MEMBER SIGNATURE	FACULTY REVIEWER SIGNATURE
DATE OF VIDEOTAPING	DATE OF REVIEW

sufficiently general that it would have been valuable for anyone involved in instructional activities, whether or not engaged in CPE. In retrospect, we wish we had opened these sessions up to a wider audience, and lobbied harder for release time for a larger group of faculty to participate, at least in the instructional sessions.

In contrast to a one-day faculty development program, the opportunity to reconnect after carrying out individual portions of the project was extremely useful as a reminder and reinforcement of the instructional principles introduced in the earlier portion of the project. Lastly, the extended nature of the project encouraged a sense of ongoing participation, awareness of instructional issues, and peer appreciation.

Conclusion

The primary customers targeted by this project were faculty members seeking to enhance their teaching skills. The project appeared to be successful in meeting this objective both for junior and more experienced clinical faculty. Unfortunately, the difficulties in scheduling and the turnover among junior faculty resulted in a much lower rate of participation than anticipated. Future initiatives of this sort would do well to consider how best to address the problems relating to the relative inflexibility of clinical faculty schedules, the press to see patients and oversee students, and the difficulty of securing release time for a given group of individuals.

A logical extension of a faculty development project targeting CE instructors is an assessment of the impact of faculty training on the perceived quality of the CE delivered. Unfortunately, this was beyond the scope of the current project. Cantillon and Jones comment on the difficulty of conducting such evaluation studies, noting that they can be costly in terms of both time and resources[3]. Further, in a project such as this, evaluation studies require coordination between and among not just the project participants, but also the administrators involved in the delivery of the CE programs in which project participants taught. The logistics of such an initiative can be daunting. Nonetheless, as Cantillon and Jones emphasize, "evaluation remains an important part of the educational cycle"[3, p. 6], and one which future research in optometric education would do well to target.

A long-term goal of the project related to the development of a larger pool of potential instructors to participate in CE. Should such an effort succeed, the institution gains a potentially larger base of instructors to draw upon when scheduling CPE classes. This can reduce scheduling conflicts, reduce demands on regular CPE instructors, spread out the workload more equitably, and improve morale. Unfortunately, in view of the low number of participants, the results of the current project in this portion of the projected outcomes are mixed at best.

The process of designing improved instruction in CPE is consistent with a cycle of quality improvement in a much broader sphere. The typical college of optometry is an open system in which key players perform many roles that often require a balancing act. Our experiences suggest that a faculty development program can be quite successful in its impact on participating individuals and small groups, but that the challenges of dealing with the wider environment should not be underestimated.

References

1. Newble D, Cannon R. A handbook for medical teachers, 2nd ed. Boston: MTP Press, 1987.
2. Knowles M. The adult learner: A neglected species, 2nd ed. Houston, TX: Gulf Publishing, 1978.
3. Cantillon P, Jones R. Does continuing education in general practice make a difference? BMJ 1999; 318(7193): 1276-1279.
4. Shaughnessy AF, Slawson DC. Are we providing doctors with the training and tools for lifelong learning? BMJ 1999; 319(7220):1280.
5. Medio FJ, Morewitz SJ. Self-directed learning. In: Robbins J, ed. Primary care podiatry. Philadelphia, Saunders:1994.

Industry News

(Continued from page 73)

retailers in major global markets. "We can't imagine having a better partner to participate with in the sport sunglass industry," said Al Berg, chief executive officer of Marchon.

Since introducing its first line of sport sunglasses in 1996, Nike has combined innovation and technology to design eyewear that offers athletes superior fit and function. Nike Max Lenses were added this year to minimize distortion and protect eyes from harmful UVB rays.

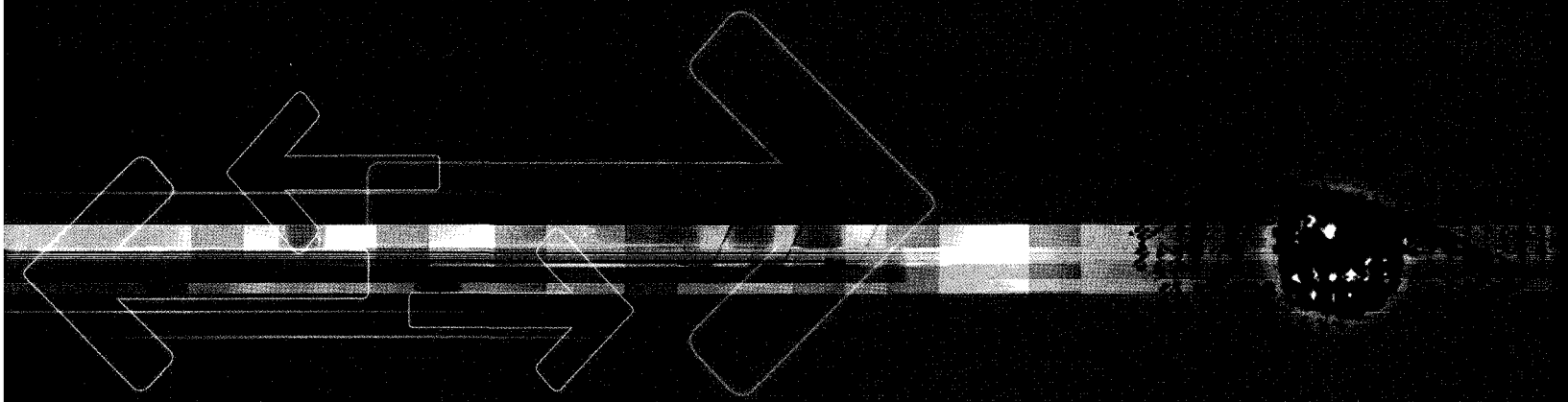
Marchon also brings patented Flexon" memory metal frame technology for use in both sunglasses and optical frames. Flexon is a highly durable, lightweight, bendable memory metal alloy. Ten times springier than spring steel, Flexon can "remember" its original shape, and return to that set shape after duress. For athletes who require durable, light, secure-fitting sun and eye protection during a workout, the versatile Flexon material will be a big plus. For more information, contact www.marchon.com

PRIO Computer Vision Testing To Be Offered At D.O.C.

A leading optometric retail chain – D.O.C., based in Southfield, Michigan – now offers the PRIO computer vision test to all its customers. D.O.C. is using the PRIO test as the foundation for its new Websight computer vision care program. "D.O.C. Optics is known as an industry leader when it comes to recognizing new trends in the eye care business," said PRIO's president and CEO Jon Torrey. "It's exciting to see D.O.C. embrace PRIO's technology as the foundation for their own computer vision program."

The PRIO test, now used by over 1100 optometrists across the country, is the only FDA-released device to simulate a computer screen in the eye doctor's office, allowing them to diagnose and treat computer vision problems.

PRIO, based in Beaverton, Oregon, developed the PRIO Computer Vision Tester in 1993. For more information call 1-800-621-1098 (www.prio.com).



New VARILUX® PANAMIC™

A WORLD WITHOUT BOUNDARIES

New Varilux Panamic provides your active and demanding presbyopes more complete visual freedom—helping them feel closer to their pre-presbyopic vision.

Only Varilux Panamic incorporates the unique concept of Global Design Management™, which requires the entire surface of the lens to be balanced similar to a single-vision lens. No other progressive addition lens optimizes the wearer's combined physiological needs in binocular, peripheral, and central vision for quick and easy adaptation.

Help your patients regain their visual freedom with new Varilux Panamic.

Recommend new Varilux Panamic in these premium lens materials: Airwear™, Thin & Lite®, or Ormex® Transitions® Gray. And remember to offer your patients Crizal®, the durable anti-reflective coating you can rely on.

www.variluxpro.com

1-800-BEST PAL

Progressive Addition Lens

VARILUX®

The comfort of better vision®