The Journal of the Association of Schools and Colleges of Optometry

OPTOMETRIC EDUCATION

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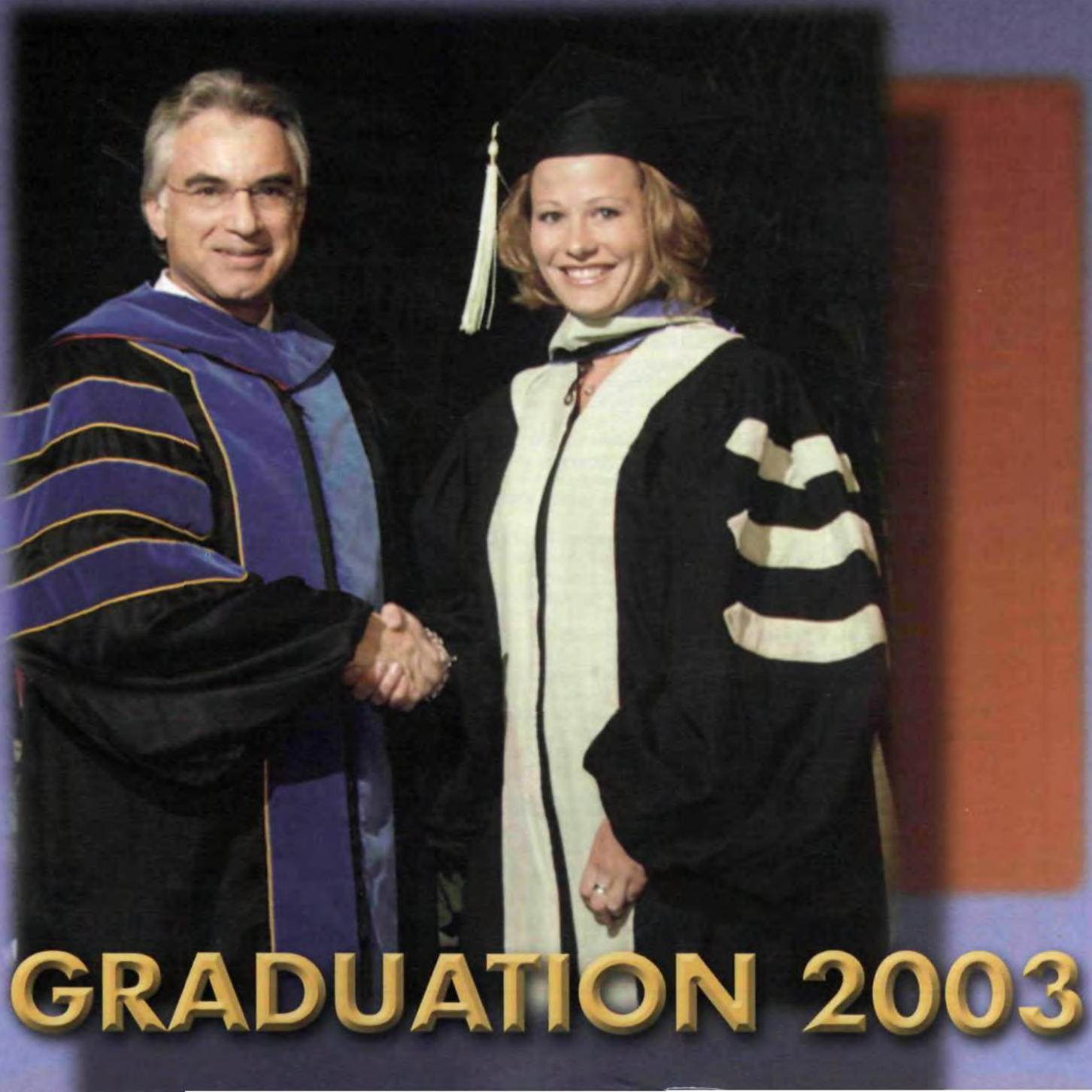

GRADUATION 2003

Association of Schools and Colleges of Optometry

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CONTENTS

The Journal of the Association of Schools and Colleges of Optometry

DEPARTMENTS

Cover photo courtesy of Nova Southeastern University College of Optometry. Dean David S. Loshin, O.D., Ph.D., congratulates Jennifer Kane,O.D., who received the award for outstanding optometry student for 2003. Nova's College of Optometry conferred degrees on its 10th graduating class this year.

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 $30.00 per year, $40.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Rockville, MD. Advertising rates are available upon request. OPTOMETRIC EDUCATION disclaims responsibility for opinions expressed by the authors. Indexed in Current Index to Journals in Education (ERIC).

EDITORAL

Surveys Provide Opportunities for Evaluation

Lester E. Janoff, O.D., M.S.Ed., F.A.A.O.

This issue presents five outstanding articles on a variety of subjects. LaMotte and Nishimoto question the need for training students in the use of Automatic External Defibrillators (AED), since these devices may be present in clinical sites that students rotate through. The authors surveyed supervisors at a large number of outreach clinics that serve as training sites for the Southern California College of Optometry. The reader will discover some interesting information about AED's in general.

Soroka and Reis investigated the managed care courses and topics that are offered by the schools of optometry, their placement in the curriculum and the number of hours devoted to specific topics. A survey instrument was developed and sent to the deans of the 17 schools in the United States and Puerto Rico. It was interesting to note that four schools do not offer any discussion of Medicaid, a rather large managed care program in many states. It was a revelation to discover that the typical optometrist in the United States participates in six managed care networks.

Pagani and Malloy describe how they have used the poster presentation format as an educational tool in their third year, case-based Clinical Medicine Laboratory course. It is likely that few students in optometry schools receive training or gain experience on how to create and present a scientific poster. In their course the objective was not only to use the poster format as a means for the student to discover information on a specific topic, but to increase future practitioner contributions to scientific poster sessions. Preliminary and follow-up surveys determined the student comfort level and anticipated future participation in poster presentations. Although students responded positively to the poster format as a teaching tool, the impact on their future participation will have to be determined at a later date.

Students at Indiana University School of Optometry have been surveyed annually since 1995 regarding their computer skills. Dr. Rainey reports on these results in his paper. This valuable information was used by the school in the development of computer tools used for teaching purposes. As one might expect, the author found that students are becoming more experienced with computer use and the Internet. How computer literate are students at your school? Should a computer now be required student equipment? I don't think it will be long before a computer (probably a laptop) will be required on matriculating at all schools and colleges of optometry.

Dr. Elam surveyed third and fourth year students at Southern College of Optometry to determine the students perception of the effectiveness and learning value of their nursing home rotation. The results presented came from 60 students, the majority of whom felt their nursing home rotation had overall clinical learning value. As the author points out, with the aging of the U.S. population, nursing home rotations can be an excellent source for clinical experiences.

The interesting fact is that all of these articles share a common element — the survey of participants to determine the extent or value of the activity in question. In short, these articles involve evaluation techniques for both formative and summative purposes, a critical aspect of any educational program. Evaluation gives us feedback and a sense of accomplishment. It also provides guidance for future planning. As optometric educators, evaluation should be a welcome activity.

Managing Managed Care in the Classroom

Dominick M. Maino, O.D., M.Ed., F.A.A.O.
Geoffrey Goodfellow, O.D., F.A.A.O.

Can we really teach managed care to students who are already overwhelmed with all the other "must know" knowledge we jam into our curricula? Maybe. Here's some online assistance that should make your job a little easier.

Managed Care Education Connection (http://www.mceconnection.org/mce/) is a great resource for optometrists teaching and learning about managed care. A wide range of materials (teaching cases, curricula, articles and web-based tools) are available.

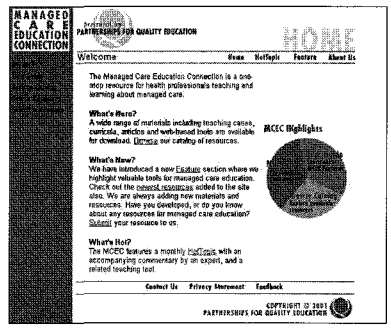
Medology (http://www.primemedical.net/managedcare.htm) has numerous resources available for those interested in managed care from the humorous *MC MD Adventures in Managed Care* to the online version of *Managed Care Magazine.*

Confused about the terminology used in managed care? Just go to http://www.thci.org/other_resources/glossary.htm to figure out just what the MC Gurus are talking about.

Do you want to become an advocate for your clinic patients or do you want your students to know how they can become advocates? Log on to http://www.mccapny.org/libeduc.htm. This is the NYC Managed Care Consumer Assistance Program (MCCAP), which was created in response to consumers' demands for help with managed care.

Need even more links to help you teach managed care? Try the Tufts Health Care Institute at http://www.tmci.org/other_resources/links-miscresources.htm.

Other resources include:
The Agency for Healthcare Research and Quality (http://www.ahrq.gov/) and online quality assurance and managed care publications (http://www.uic.edu/sph/cade/mch_managed_care/publications.htm)



PDAs in Health Care

Has your clinical education program started to rely on handheld computers to assist the student in patient care? We use the Epocrates (http://www.epocrates.com) drug program almost every day and encourage our students to do so as well. Where else can you learn about using PDAs in Medicine? Go to the Taubman Medical Library site at http://www.lib.umich.edu/taubman/PDAres.html and browse for a wealth of information concerning PDAs in healthcare.

How do medical students currently use PDAs? According to one online (http://www4.umdnj.edu/cswaweb/ccpc_pres/mazzapda00/v3_document.htm) slide presentation, 63% read PDA based textbooks, 38% use PDA drug references, and 63% use them to track patients.

Need more PDA information? Just go to:
http://www.ecu.edu/bsomacaddev/webguides/PDAlinks.html
http://www.medfools.com/pda.php
http://www.business2.com/webguide/0,1660,50630,00.html
http://www.pdamd.com/vertical/home.xml
http://www.pdamd.com/vertical/tutorials/wake_forest.xml
http://www.eyepalm.com

Students in a Nursing Home Rotation

Do our students have a higher probability of injury if they provide care in a nursing home environment? In one study those working in nursing homes had significant work-related injury risks. These injuries occurred because of the absence of equipment, insufficient knowledge of the proper techniques in assisting patients, lack of staff available, and inadequate training and education of staff. Want to learn more? Go to http://www.uchsc.edu/pmb/occmed/hcrisks.htm.

And finally.... a free trial of *VisionCite* is now available. VisionCite is ICO's unique periodical citation index that offers access to more than 178,000 articles indexed from 1984 to the present. Over 110 periodicals are regularly indexed with 12,000 citations added yearly. All periodicals received are scanned for articles on optometry, ophthalmology, contact lenses, reading, perception, and other vision related subjects while PubMed (MEDLINE) indexes 65 ophthalmic periodicals but only three optometric titles. Contact Gerald Dujsik (gdujsik@eyecare.ico.edu) for a one-month free trial.

SCHOOL NEWS

Dr. John F. Amos was recently named Dean of the **School of Optometry at the University of Alabama at Birmingham**. The announcement came from Eli Capilouto, acting provost at UAB. Amos has served as interim dean since October 2000. Prior to being named interim dean, Amos served six years as the chair of the department of optometry and director of professional programs for the school. Amos joined UAB in 1972 and has held a number of administrative positions within the school including chief of the Family Practice Optometry Residency Program, director of Optometry Residency Programs, chief of Primary Vision Care Services and co-director of the externship program.

Dr. Amos has earned numerous national awards, most recently the 2003 Distinguished Service Award from the American Optometric Association, which was presented at AOA's Annual Congress in San Diego.

Dr. Karla Zadnik, a nationally known optometric researcher and a distinguished professor at **The Ohio State University College of Optometry**, testified recently on behalf of AOA before the House Subcommittee on Labor, Health and Human Services, Education and Related Agencies on behalf of increased funding for the National Eye Institute. Dr. Zadnik said that NEI this year will receive a little more than $633 million in funding. The president wants to increase that to $648.3 million for FY 2004. Although a 3.7 percent increase over the administration's revised budget for the agency in FY 2003, it would not keep pace with the funding increases for other NIH institutes - and would not be enough to fund important eye research.

Dr. Elizabeth Hoppe, Southern California College of Optometry, recently represented ASCO on the Advisory Committee to the Association of Schools of Public Health. The Committee's project was to develop and launch *Advocating for Folic Acid: A Guide for Health Professionals* (www.folicacid.net). This free, web-based course - designed for current and emerging health professionals - provides information such as the benefits of folic acid and strategies for counseling individuals regarding folic acid intake. The module also includes a section that contains detailed information for specific health professionals including optometry, such as why and when they should counsel individuals. The project was made possible through funding from the March of Dimes.

Drs. Nancy Peterson-Klein, Randy Vance and Mark Swan of the **Michigan College of Optometry at Ferris State University** have developed a distance-learning project for fourth year clinical students. A Total Quality Education grant from CIBA Vision and the Association of Schools and Colleges of Optometry helped launch the project. The Michigan College of Optometry also contributed significant funds. The program began with a technology symposium for externship directors.

The symposium brought all externship directors to campus for two days of informatics continuing education. The next phase was the development of a WebCT course for fourth year students, which involved establishing a curriculum, online resources and facilitating infrastructure development and compliance at more than 20 off-campus clinical sites. The project has led to a $50,000, multi-center grant involving three optometry schools, a PowerPoint presentation to the ASCO Informatics Special Interest Group and a scientific poster at the American Academy of Optometry Annual Meeting.

Dr. Anthony Adams, dean of the **University of California at Berkeley College of Optometry** from 1992 - 2001 and professor of optometry since 1968, was announced as the recipient of the California Optometric Association's highest Award. In the almost 40 years since the Paul Yarwood Memorial Award was first bestowed, only six optometrists have been so honored. Dr. Adams served as President of the American Academy of Optometry and is a recent member of the National Advisory Eye Council where he consulted for the Director of the National Eye Council, National Institutes of Health and the U.S. Secretary of Health and Human Services. He was elected a member of the National Academy of Sciences Committee on Vision and is a past chairman of the Committee on Vision of the National Research Council.

Through a 1.25 million dollar gift, the **Pennsylvania College of Optometry (PCO)** has recruited Dr. Alexander Dizhoor as the new Hafter Endowed Chair in Pharmacology and Professor in Pharmacology. Dr. Dizhoor is a well-published scientist and lecturer who earned his Ph.D. from Moscow State University in Russia. Dr. Dizhoor and associates will research retinal cell function, concentrating on sub-cellular signaling mechanisms that may contribute to making retinal degeneration a preventable or treatable condition.

"Our recruitment of Dr. Dizhoor represents the next major step forward in PCO's long history of supporting ophthalmic bio-science research," said PCO President Dr. Thomas Lewis.

Dissent — a Cornerstone of a Spirited Academic Community

Alden N. Haffner, O.D., Ph.D., F.A.A.O.

During the past few months, events in large cities and in small hamlets have vocalized and accented a multitude of opinions on a spate of subjects, most notably those of national and international concern. Nowhere have the expressions of dissent been more vibrant than on college and university campuses from coast to coast. Young persons and old have expressed their views with clarity and vigor on issues relating to the war in the Persian Gulf, the rise of tuition levels, cutbacks in healthcare services, nuclear safety and the public health hazards of international secrecy about SARS — and hosts of other issues of currency, large and small.

Opinions are strong; they are heartfelt, varied and not infrequently emotional. We disagree, we dissent, we demonstrate, we march, we argue and, above all, we express our views for all to read, to see, to hear and better to understand the issues. From the time of our founding fathers to today, dissent and disagreement, responsibly and honestly driven, are, in my respectful view, essential cornerstones of a great and vibrant democracy that is our American form of government. To attempt to downplay, degrade or, God forbid, stifle or destroy intellectually honest disagreement is both deleterious to our society and degrading to our democracy.

There is a very long and distinguished history in our country of publications, representing the intellegentsia of all spectra of intellectual thought about the public issues of our times. They have molded public opinion, shaped public policy, motivated the people and, above all else, they have strengthened our country's precepts of a just and legal multifaceted society. Nowhere else is this more important than on the college and university campuses. Nowhere else is it more important to instill the concept of respect for intellectually and honestly driven dissent and disagreement than among young minds on the campuses.

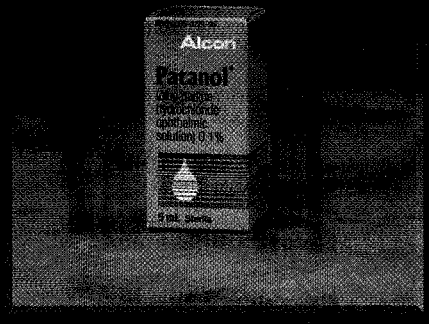
In all the realms of science we have achieved progress and advancement because we have opposing points of view, varying theories and frequently different methodologies to apply our scientific knowledge. Somehow, it seems that our intellectual disagreements in science, which have led to remarkable advancements of human welfare, are more acceptable than those disagreements in the political arena and in public policy. It decidedly should not be so.

The very justifiable concern for homeland security cannot be understated since the horrendous events of September 11th. No one who lived through that experience can minimize the essential and critical concerns for safety and security of the American public. But those concerns cannot and must not be the excuse to stifle honestly driven and intellectually responsible political and policy dissent. And we must surely guard that safety and security for our nation, for our people and for the democratic traditions of our polity.

Great college and university campuses across the land are full of intellectual ferment as, indeed, they should be. For the campus is, in its most fundamental sense, the intellectual community of ideas, of scholarly pursuits, of conflicting thoughts and of debate and, yes, dissent. Our democracy, our cherished freedoms and the progress of the well being of our citizenry are heavily and critically dependent upon a spirited academic community. And, so, God willing, should that dependence continue. Finally, let us celebrate the virtues of responsible dissent and intellectual disagreement for the worth that they bring to an open and democratic society. For they are essential parts of a pluralistic society and, in innumerable ways, the fundamental underpinnings of our freedom.

Dr. Haffner is president of the SUNY State College of Optometry. These comments were excerpted from opening remarks that he made at its June 2003 commencement.

Vision and Commitment



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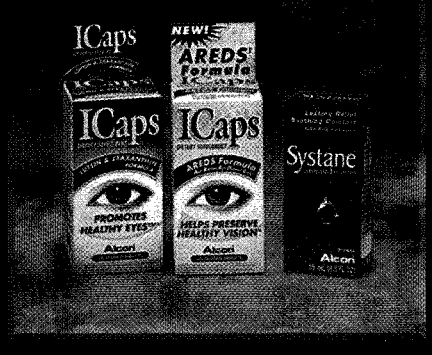

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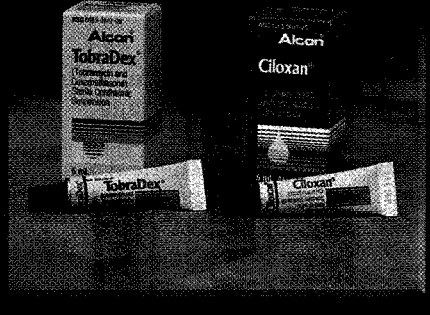

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INDUSTRY NEWS

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* ASCO Corporate Contributors support national programs and activities benefiting the schools and colleges of optometry. For more information on the program, contact porourke@opted.org

Vistakon® Grants Scholarships to Optometry Schools

As part of its ongoing focus on education, VISTAKON®, Division of Johnson & Johnson Vision Care. Inc., will provide a $1,000 scholarship to each of the 19 optometry schools in the United States, Canada and Puerto Rico. The scholarships are part of the ACUVUE® Eye Health Advisor Program and complement other services that VISTAKON® supplies to new and student Eye Care Professionals (ECPs), including exam and waiting room educational resources and *new O.D.* magazine.

Recipients of the scholarship will be selected based on academic and extra-curricular achievements. Recipients must be second or third year students who uphold standards of eye care practice, including the promotion of eye health and proper contact lens wear and care as well as community service and volunteerism. Each school will choose its winner and present the $1,000 award along with a personalized plaque. Interested students should contact their school's Office of Student Affairs.

"VISTAKON® has always generously supported optometry schools and helped graduates make the sometimes daunting transition from students into bona fide ECPs," said Dr. George Foster, dean of Northeastern State University's College of Optometry, one of the schools that will grant the scholarship. "Through the ACUVUE® Eye Health Advisor Program educational materials for both students and patients, and financial support from VISTAKON®, we've been able to strengthen our curricula and train students on the latest professional techniques and products. This kind of practical assistance and information makes a big difference for ECPs just getting their practices started."

Novartis Data Confirms Role of Visudyne® Therapy

New data presented at the 2003 ARVO meeting suggest that Visudyne® therapy reduces the risk of vision loss in "wet" AMD patients with minimally classic lesions, a form of wet AMD previously considered untreatable. Additional data to support the role of Visudyne in patients with predominantly classic AMD demonstrate that visual outcomes continue to remain stable five years after initiating therapy, providing further evidence of the safety and long-term efficacy of Visudyne

"These data suggest that patients with minimally classic lesions treated with Visudyne therapy had a reduced risk of vision loss compared with placebo treated patients," commented Dr. Neil Bressler, chair of the Visudyne Study Advisory Group, retina specialist and the James P. Gills Professor of Ophthalmology at the Wilmer Eye Institute of the Johns Hopkins University School of Medicine in Baltimore. Novartis has partnered with QLT, Inc to develop and market Visudyne through an on-going clinical trial involving more than 1,000 patients.

Transitions Announces Appointment of New Marketing Director

Frank Reilly has joined Transitions Optical, Inc. as North America marketing director. He will be responsible for the development, management and implementation of Transitions Optical's North American trade and consumer marketing strategies. He brings to Transitions 30 years of experience serving in key marketing, sales and business development positions for some of the finest global healthcare companies. Reilly's experience includes positions with Johnson & Johnson, Nestle, Bayer and Cardinal Health.

"We are thrilled to welcome such an outstanding sales and marketing pro to Transitions," said David Cole, general manager of the Americas, Transitions. "Frank's vast healthcare and pharmaceutical experience, along with the perspective he utilized on the UV protection issue while working with Sea & Ski, were highly appealing to us as we roll out our trade and consumer education initiatives related to eye health," Cole added.

"I'm excited about the opportunity to help bring the optical industry fully integrated programs that can help create awareness of the importance of eye health and build interest in Transitions® Lenses as a convenient UV radiation and glare protection option," Reilly said. "The

(Continued on page 118)

(Continued from page 117)

eye health initiative Transitions is embarking upon can benefit from the lessons learned in the skincare industry. I look forward to helping Transitions play a leading role in the eye health discussion."

Essilor Announces New Technology Grants

Essilor of America (EOA) will begin accepting applications for the Essilor Optical Technology Grants – three $20,000 grants to be awarded to schools and colleges of optometry that exhibit commitment to growth in the ophthalmic industry through new advancements. Dr. Rod Tahran, Essilor's vice president of professional relations/clinical affairs, made the announcement at the Association of Schools and Colleges of Optometry meeting June 20.

Applications may be obtained by writing to dventura@essilorusa.com. Entry requirements include a description in 1,000 words or less of why the school needs and deserves the grant. Applications will be judged on the school's commitment to the growth of premium optical technology as well as how the money will help the school elevate the standards and visibility of ophthalmic dispensing for students. Applications must be received by November 1 at Essilor Lenses, 2400 118th Avenue North, St. Petersburg, FL 33716.

Alcon Presents New Study Results

Alcon, Inc. recently presented results of two new studies involving Patanol®. One of the studies shows that olopatadine, the active ingredient in Patanol, does not disrupt or damage cellular integrity, unlike antihistamines used to treat allergic conjunctivitis. Olopatadine is a dual acting antihistamine and mast cell stabilizer.

The study examined the non-specific membrane effects of various antihistamines and compared them with those produced by olopatadine on the same membrane preparations. The affinity of the antihistamines for model membranes was directly correlated with drug-induced histamine release from human conjunctival mast cells. This study showed that, unlike topical antihistamines, olopatadine does not non-specifically interact with cell membranes and thus does not disrupt or damage cellular integrity.

"A lack of non-specific membrane activity makes olopatadine a safer, more comfortable product, as evidenced in published clinical results," explained John M. Yanni, Ph.D., vice president, pharmaceutical research, R & D.

Volk Optical Adds New Lenses

Volk Optical, the industry leader in aspheric optics, has expanded its popular clariVit lens line with the addition of AutoClaveSterillizable clariVit lenses. The new lenses decrease processing time while offering high-quality imaging comparable to traditional vitrectomy lenses. Available in Central Mag and Wide Angle designs, the ACS lenses can be safely steam-sterilized and will withstand exposure to both bleach and alcohol. The two-part design separates for cleaning yet maintains its integrity during surgery. After autoclaving the two pieces of the lens, water or saline is added to the contact element, and the pieces lock solidly together for use.

Volk also introduced the Digital 1.0x lens for use in general diagnosis as well as slit lamp imaging and photography. The Digital 1.0x provides a clear view of the posterior pole with a field of view of 60º static/72º dynamic. The exclusive high-index glass design provides improved resolution for clearer views of the anatomy. An anti-reflective coating and glass design reduce glare and reflections during diagnosis and when capturing photographic images. To order or obtain more information about Volk products, visit www.volk.com or phone Volk at 1-800-345.

FDA Acts on Carl Zeiss Meditec Device

Carl Zeiss Meditec announced U.S. food and Drug Administration's (FDA) clearance of the retinal nerve fiber layer (RNFL) normative database for its Stratus OCT (optical coherence tomographer) diagnostic device.

"We are extremely pleased with the news of the FDA decision," said Dr. Michael Patella, vice president of professional affairs. "We can now provide clinicians with a guidepost to determine how a patient's retinal nerve fiber layer compares to a normal range. We believe that this is a significant step in establishing the role of the Stratus OCT as part of the standard of care in glaucoma management." The Stratus OCT is the first instrument that permits doctors to see direct cross-sectional images of the retina, similar to CT scans of internal organs but without the use of X-rays. Instead, the Stratus OCT uses a beam of light to rapidly scan the eye and generate an image without ever touching the patient. Studies have shown that changes in the thickness of the retinal nerve fiber layer may be an early indicator of glaucoma.

For more information, contact Travis Lindsay of Carl Zeiss Meditec at 1-925-557-4699 or t.Lindsay@meditec.zeiss.com

Correction

In the spring 2003 issue (Volume 28, Number 3) the academic degrees of one of the authors of the article, "Specialization and Credentialing in Optometry," were incorrect. The author and her correct degree is Stephanie Messner, O.D., F.A.A.O.

A Survey of Managed Care Education at Optometry Schools

Mort Soroka, Ph.D.
Lesley Reis, M.P.A.

Abstract

Managed care has greatly influenced the practice of optometry, and students entering the workforce require a different set of skills from their colleagues currently in practice. Despite the fact that managed care has changed the mode of optometric practice, there has been no curricular assessment of the managed care content within optometry schools. This study was designed to determine the courses and topics that are offered within the schools, their placement in the curriculum, and the total number of hours devoted to managed care. A survey of faculty members responsible for addressing managed care topics in their courses indicated significant variations in the curricula. A core set of materials does exist and could be incorporated into each school's curriculum in order to better equip practitioners with a broader perspective on health care and to prepare them for their roles as providers.

Key Words: *Managed Care, Health Care Delivery, Curricular Assessment, Optometric Education, Practice Competency*

Introduction

To compete in today's evolving health care environment, health care providers must understand the intricacies of managed care and be able to navigate the hurdles and implications of joining managed care networks. The once dominant mode of health care delivery, fee-for-service, is now a rarity. Most employers and third party payors, including the federal and state government on behalf of Medicare and Medicaid beneficiaries, are steering enrollees into some form of managed care in an effort to control rising health care costs. Today more than 178 million Americans (62% of the population) are enrolled in an HMO or PPO.[1] Approximately 5.5 million Medicare beneficiaries and 19.6 million Medicaid recipients are enrolled in capitated models of health care. While the level of managed care penetration varies among states, there is no doubt that it has become a driving force in health care delivery. A changing health care environment compels health care providers to navigate the complexities of managed care in order to gain access to potential patient bases.

Managed care has also influenced the practice of optometry, and students entering the workforce require a different set of skills from those who graduated previously. In some regions of the country, more than half of all patients are enrolled in managed care plans. The typical optometrist in the United States participates in six managed care networks.[2] Despite the fact that managed care changed the mode of optometric practice, there has been no curricular assessment of the managed care content within optometry schools. Although optometric education has responded to the expansion of scope of practice, it is not clear whether the curriculum has adequately kept pace with changes in the delivery of eye care. An informal survey of faculty members at several optometry schools indicated significant differences in the training of students in managed care principles. Several commented on the lack of sufficient hours devoted to managed care. Based on these findings, this study was designed to determine what courses and topics were offered within the colleges of optometry, their placement in the curriculum, and the number of hours devoted to the specified topics. The study sought to determine the availability of a core set of materials that may serve as the building blocks of a model curriculum for optometry.

Methods

A survey tool was developed to identify the current level of managed care instruction at schools of optometry. Specific managed care topic areas were selected based on published medical education surveys.[3] Databases that dealt with managed care competencies, including the Curriculum Management and

Dr. Soroka is a professor in health care policy at the SUNY State College of Optometry and director of the Center for Vision Care Policy, State University of New York. He is a visiting scholar at New York University and the executive director for the Optometric Society of New York. He has authored numerous articles and conducted many studies in health services research relating to optometry in Medicare, Medicaid and managed care.

Ms. Reis received her Masters in Public Administration from the Robert F. Wagner Graduate School of Public Service and completed a residency program in health administration at the College of Optometry, State University of New York. She is a health researcher at the Center for Disease Control and Prevention at the United States Department of Health and Human Services.

Information Tool (CurrMIT) from the Association of American Medical Colleges, were also used.[4] Eleven managed care topics were chosen for evaluation and included in our survey instrument: Distribution of Health, Disease and Public Health Problems; Health Insurance; Health Care Delivery and Organization of the U.S. Health System; Medicare; Medicaid; Health Economics; Managed Care and HMOs; Health Care Personnel and Eye Care Workforce; Quality Assessment and Assurance; Ethics and Managed Care; and Legal Issues and Medical Jurisprudence.

The survey sought to determine the extent to which each of the 11 managed care topic areas is included in the curricula. The following elements were collected:

- The number of hours devoted to each topic and their placement in the curriculum
- The location of the materials as part of a managed care course or as a component of another course
- Course requirements, assigned readings and text, and the instructor's method of student assessment
- The instructor's opinion on the sufficiency of the hours devoted to each topic and the effectiveness of his or her school's curriculum in addressing each subject.

Academic deans of the 17 schools of optometry in the United States and Puerto Rico were contacted and asked to identify all instructors responsible for addressing managed care topics in their courses. A study packet was mailed in March 2001 to all instructors. The material included the survey instrument, an explanation form describing the 11 topics in further detail, and an instruction sheet elaborating on each question in the survey.

Non-responding faculty members were contacted by telephone and e-mail and additional survey packets were distributed when the original mailing was misplaced or not received. When instructors informed us that they were not responsible for the subject matter, we asked to be directed to the appropriate instructors. In many instances, more than one instructor was responsible for addressing managed care topics. When this occurred, some schools had each instructor fill out individual surveys, while other schools had the instructors collaborate for a single, overall assessment.

All surveys were reviewed and allotted hours were compared to the course syllabi provided by the instructor and verified by the school's catalog. Survey responses suggested that managed care material was presented as both stand-alone public health courses and as components of other courses, and the content was often taught by multiple faculty members. Although an instructional guideline was provided to all respondents, the total number of hours attributed to each managed care topic was subject to some degree of variation because different faculty members defined certain topics more broadly than others. In a few instances, reported hours either exceeded the total number of hours within the school's bulletin or reported managed care topics were assigned to a practice management course whose outline clearly described the topic as a practice management one. Minor adjustments were made to the reported total number of hours devoted to a specific topic when course hours assigned to managed care were determined to be associated with different areas (i.e. practice management). Respondents were contacted to confirm these changes and ensure that accurate hours were associated with the managed care curriculum. In determining the number of hours devoted to managed care, only didactic courses were assessed because these contact hours could be specifically quantifiable. Although managed care issues may be discussed during clinical rotations in specific clinic settings or incorporated as part of a record review or case analysis, clinical encounters and clinical case seminars were not considered in this evaluation.

Results

Quantitative information concerning the teaching of managed care in the schools of optometry was generated from the responses to our survey. Of the 17 schools of optometry, completed questionnaires were received from every school for a response rate of 100%. Surveys were analyzed using Microsoft Excel and descriptive tables were generated to analyze the means, range of hours, and standard deviation. These findings are presented in Tables 1-3. Table 1 shows the percentage of schools with assigned hours covering the eleven curriculum topics and, for the schools that cover each topic, the average number of hours.

Each managed care topic is presented in the curricula by at least three quarters of the schools. The average number of hours devoted to specific managed care topics ranged from two to six hours. As illustrated in Table 1, there is no statistically significant correlation between the average number of hours devoted to each managed care topic and the percent-

Table 1: Coverage of Managed Care Curriculum Topics

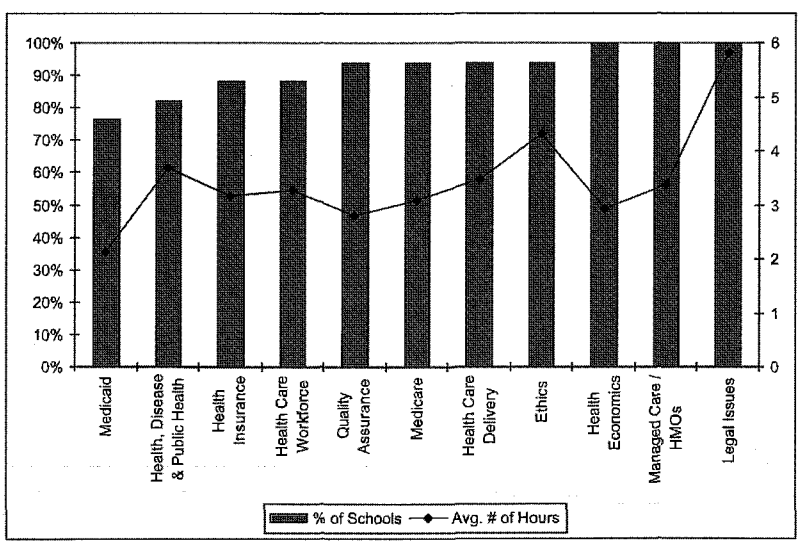


Table 2: Total Number of Hours Devoted to Managed Care Topics

College of Optometry	Health & Disease	Health Insurance	Health Care Delivery	Medicare	Medicaid	Health Economics	Managed Care	Workforce	Quality Assurance	Ethics	Legal/ Jurisprudence	Total Number of Hours
IU	3	2	4	2	2	3	2	2	1	2	4	27
ICO	1	0	0	2	0	2	1	1	0.3	3	1.5	12
IAUPR	3	1	1	1	0.5	0.5	0.5	1	1	3	2	14.5
MCO - Ferris	5	1	8	2	2	4	6	7	3	5	1	44
NEWENCO	1	3.5	3	6	0	5	5	3.5	2	2.5	10	41.5
NSUCO	4	3	3	4	2	4	4	6	4	3	21	58
NOVASE	3	5	3	2	2	4	4	5	4	8	8	48
OSU	0	2	1	3	0	2	3	0	3	0	1	15
PU	3.3	3.2	4.3	7	2.2	3	2	1.5	5.5	5	3	40
PCO	4	6	4	2	2	2.5	5	4	2	1	3	35.5
SCCO	1	2.5	2	2.5	2.5	2	1.5	2.5	4	4	13	37.5
SCO	4	5	5	4	3	7	5	2	5	11	13	64
SUNY	5	4	6	4	3	2	8	3	7	6	5	53
UAB	0	4	1	3	1.5	1	2	0	0.5	1	2	16
UCB	0	0	2	0	0	2	2	2	0	2	3	13
UH	4.5	0.5	4.5	3	3	1	1.5	2.5	0.5	10.5	0.5	32
UMSL	10	5	4	2	2	5	5	6	2	2	8	51
Topic Range	0-10	0-6	0-8	0-7	0-3	0.5-7	0.5-8	0-7	0-7	0-11	0.5-21	12-64
Topic **Mean**	3.7	3.2	3.5	3.1	2.1	2.9	3.4	3.3	2.8	4.3	5.8	35.4
Topic Median	**3.6**	**3.2**	**3.5**	**2.75**	**2**	**2.5**	**3**	**2.5**	**2.5**	**3**	**3**	**37.5**

age of schools currently presenting the material at some point in the four-year curriculum. Table 2 shows that the total number of hours devoted to the 11 managed care topics at each school ranged from 12 to 64 hours. The number of hours spent by the schools addressing each managed care topic varies greatly by school.

Although managed care is taught throughout the four-year academic program, a majority of the topics listed in Table 3 were covered in the first and third years of study. As also seen in Table 3, very few schools covered managed care material in the second year and coverage in the fourth year of study was also minimal.

A linear relationship between the coverage of managed care topics and the level of managed care penetration in the state in which each school is located is suggested. With a few exceptions, schools with the greatest number of managed care curriculum hours appear to be located in states having a high percentage of patients enrolled in managed care plans. Differences between public and private institutions do not appear to contribute to variations in the total number of hours devoted to each managed care topic. However, the total number of managed care hours offered by private institutions is primarily clustered in the middle of the distribution while the instruction at public institutions ranges from the highest to the lowest total number of managed care curriculum hours. Table 4 illustrates that the linear relationship between the six private schools and managed care penetration rate by state is statistically significant. Private schools located in states with a higher rate of managed care penetration tend to provide

Table 3: Managed Care Topic Placement

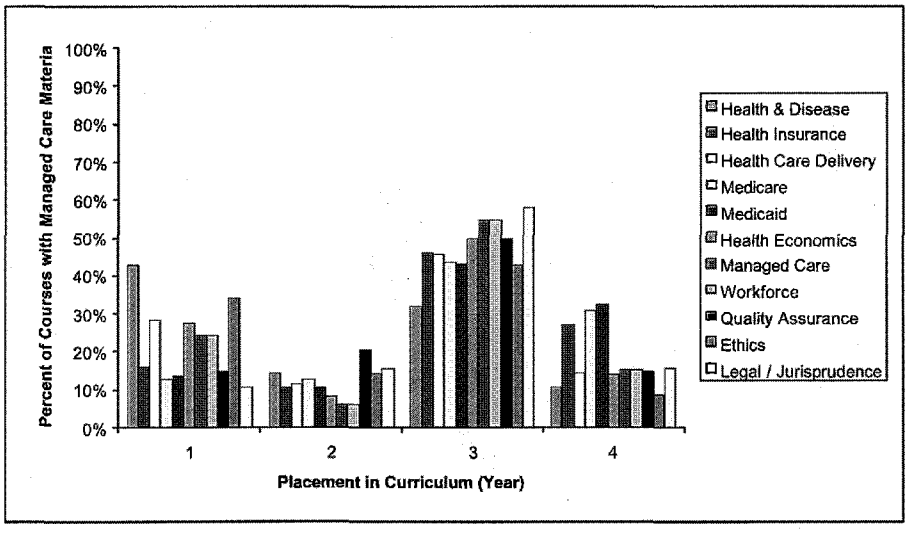
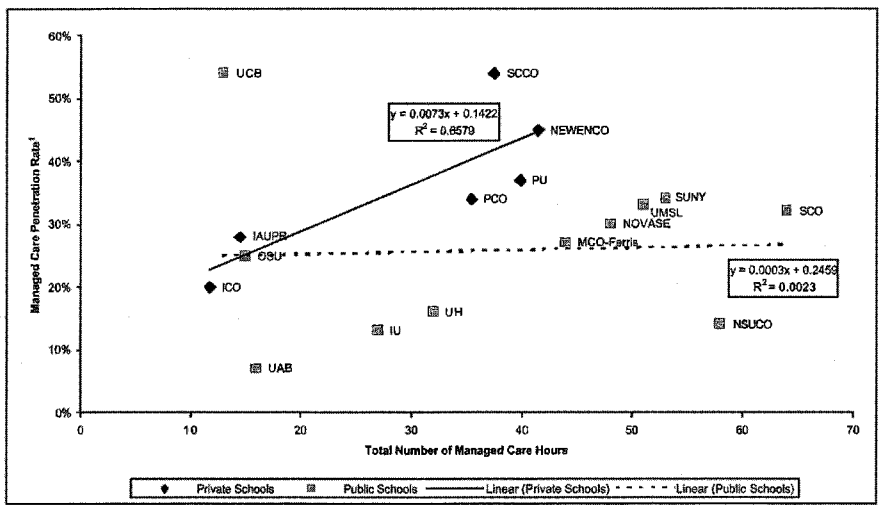


Table 4: Curriculum Hours and Managed Care Penetration Rate By Type of Institution (Private or Public)



The Henry J. Kaiser Family Foundation. (2002). State Health Facts Online. *HMO Penetration Rate, 2000* [Online]. [Cited 2002 March 21]; Available from: URL: http://statehealthfacts.kff.org

a greater number of hours of instruction in managed care. For the eleven public schools, this relationship is not statistically significant.

Managed Care Topics

All 17 schools cover legal issues and medical jurisprudence to some extent in the curriculum, mostly in the third year of study. Legal and jurisprudence issues had the greatest range in coverage within the curriculum of the 17 schools (0.5-21 hours). If the number of lecture hours is a barometer of the importance schools give to a subject, legal issues appear to be the most important managed care topic. Although a review of the course outlines provided by instructors indicates that the content covered goes beyond managed care, this topic still has the highest average number of hours (5.8 hours) of all the eleven managed care topic areas evaluated in this study.

The topics "Ethics & Managed Care," "Distribution of Health, Disease & Public Health Problems," and "Health Care Delivery" averaged 4 hours at the schools that presented material related to these topics. Instruction in these managed care topic areas includes coverage of ethical principles, confidentiality, and patient advocacy, issues concerning health status, disease prevention, distribution, and public health, and lectures dealing with the delivery of health care and the organization and regulation of the health care system.

Optometry schools devoted an average of three hours to the following five topics: "Managed Care/HMOs," "Health Care Workforce," "Health Insurance," "Health Economics," and "Quality Assurance." "Managed Care" included its evolution, various forms of HMOs, PPOs, and IPAs, the gatekeeper concept, provider networks, and advantages and disadvantages of managed care to providers and consumers. The study of health care workforce issues, including supply projections of optometrists and ophthalmologists, and the demand for eye care services; and insurance principles, benefits, and payment methodologies (premiums, coinsurance, copayments) were also included in the study of health insurance. The other two topics, "Health Economics" and "Quality Assurance" include a review of the costs of health care, market forces, and reimbursement issues and the study of topics concerning quality assurance, assessment and improvement, patient satisfaction, clinical practice guidelines, and accreditation processes.

Instruction on Medicare, the federal program covering the aged population and the most pervasive third party payor in the United States health care system, averaged three hours. While one school had no instruction on Medicare, another included seven hours relating to this program. Interestingly, Medicaid, the federal-state program covering the poor and indigent, appears to be covered only minimally at the schools. This topic has the lowest average number of hours (2.1 hours) of all the eleven managed care topic areas and the smallest variance in the total number of hours dedicated to it within the curricula (0-3 hours). Four schools fail to offer any discussion of Medicaid, the highest number of schools not covering a managed care topic. Medicaid appears to be the least important managed care issue if the number of hours is viewed as the barometer of the importance schools give to a subject area.

Discussion

As the scope of optometric licensure increases, schools have a responsibility to train students in new skills and competencies. Optometric education must also maintain pace with the changes in the health care delivery system. Optometric educators face new curricular challenges, ranging from incorporating materials relating to the treatment of ocular disease to including managed care content into the educational program. In an already overburdened curriculum, adding new course materials and hours requires creative thinking and action in order to effectively address the challenges facing optometric practitioners in the evolving managed health care environment.

Optometry students in the 21st century must be well equipped to deal with the new practice modes and financial systems demanded by managed care. Outside forces influencing the finance and delivery of health care play a major role in the graduate's professional life. In order to adequately prepare optometry students for successful practice, optometric educators must find the best way to convey managed care skills and must decide the best placement of these topics within the curriculum.

As one might expect, additions to an already over-loaded optometric

curriculum may not be well received. As noted, schools are challenged with a continuously escalating curriculum brought about by the introduction of medical treatment and surgical eye care developments. By raising the standards and forging forward into new clinical areas, optometric education has advanced dramatically over the past 20 years. However, most of the schools' representatives stressed the need to add to the curricula to meet the challenges prompted by the expansion of managed care. Indeed, three-quarters of the responding faculty felt that the hours devoted to one or more of the managed care topics were inadequate. As previously stated, the managed care competencies outlined in this study were based on surveys of managed care curriculum in medical schools.[5,6,7,8] A number of optometry schools lack instruction in areas such as Medicare, Medicaid, Health Insurance, and Quality Assurance. Using the competencies developed for medical education as a guideline (which incorporated these topics), our findings suggest that managed care content is inadequate for today's graduates. From the perspective of public health educators, we are not providing efficient training in public health policy, managed care, and health delivery organizations. A better foundation in these areas will provide practitioners with a broader perspective on health care and prepare them for their roles as health providers.

Our study was limited to the number of courses and hours of didactic study. We did not collect or quantify the number of hours in clinical rotations that a student obtains in a managed care setting. Although useful (and many schools do provide clinical experiences within a managed care organization or HMO), the educational imprint on the student cannot be quantified on the basis of hours devoted specifically to these topics. Students, for the most part, are engaged in direct patient care assignments when in the clinical setting. Activities performed by managed care organizations in areas such as quality assurance, utilization management, credentialing or financial management are often separate from the students' clinical responsibilities and students may not be exposed to these issues on a regular or uniform basis. Based on instructor responses to the survey questions, students have differing levels of exposure to managed care topics in the clinical setting, often dictated by the type and location of the rotation. For the purposes of this study, it was assumed that student clinical exposure within managed care organizations was confined to "doctor-patient" interactions rather than managed care issues. Although many schools have affiliations with HMOs, survey responses indicate that these ties are often not able to adequately alter or substitute for classroom discussions on managed care.

Conclusion

The goal of a managed care curriculum is to better equip graduates to practice in managed care settings through the development of specific knowledge and skills. This study identified a core set of managed care skills and illustrated the diversity among different schools' curricula. Despite the wide range of managed care topics offered in the schools of optometry and the diversity in the number of hours devoted to each topic, there were commonalities in course content and placement. Curricula reforms to prepare students for practice in a managed care environment may not be that difficult to undertake. For many schools it may be the adoption of a single course in managed care; for others, it may entail modifications and moderate increases in hours of existing courses.

Optometry, like medicine, should begin serious discussions to fill an apparent void in the training of its students. Recognizing the realities of professional practice, schools of optometry are encouraged to consider modifications to their coverage of managed care topics and a core curriculum should be developed that would minimize the disruption to each school's teaching structure while allowing schools to update their current managed care curriculum.

Acknowledgements

Thank you to all faculty at the various optometry schools who participated in completing the questionnaire survey.

A copy of the survey tool is available from the author upon request.

References

1 Managed Care On-Line, Inc. (2001). Managed Care National Statistics. *Managed Care Fact Sheets.* [Online]. [Cited 2002 February 13]; Available from: URL: http://www.mcareol.com/factshts/factnati.htm

2 American Optometric Association. Practice Strategies: Regional Variations. *Optometry* 2000; 71(9): 599-603.

3 Yedidia MJ, Gillespie C, Moore GT. Specific clinical competencies for managing care: views of residency directors and managed care medical directors. *JAMA* 2000; 284: 1093-1098.

4 Assocation of American Medical Colleges. (2001). Curriculum management and evaluation. [Online]. [Cited 2000 December 10]; Available from: URL: http://www.aamc.org/meded/curric/start.htm

5 Meyer GS, Potter A, Gary N. A national survey to define a new core curriculum to prepare physicians for managed care practice. *Academic Medicine* 1997; 72(8): 669-675.

6 Rabinowitz, Howard K., et. al. Innovative approaches to educating medical students for practice in a changing health care environment: The National UME-21 Project. *Academic Medicine* 2001; 76(6): 587-597.

7 Council on Graduate Medical Education. (2001). Preparing learners for practice in a managed care environment. [Online]. [Cited 2001 July 9]; Available from: URL: http://www.cogme.gov/resource.htm

8 Halpern R, Lee MY, Boulter PR, Phillips RR. A synthesis of nine major reports on physicians competencies for the emerging practice environment. *Academic Medicine* 2001; 76(6): 606-615.

Scientific Poster Format As an Educational Tool

Jean Marie Pagani, O.D., F.A.A.O.
Kelly A. Malloy, O.D., F.A.A.O.

Abstract

Purpose: *A poster session format was introduced as an educational tool into the Clinical Medicine laboratory at the Pennsylvania College of Optometry to promote competency in future participation at scientific meetings, as well as to integrate case-based, problem-solving skills in this systems-oriented course.* ***Methods:*** *Students used clinical cases and laboratory exercises to formulate poster presentations.* ***Results:*** *Preliminary and post-laboratory surveys evaluated the effectiveness of this dynamic educational process.* ***Conclusions:*** *This educational paradigm was well received by both faculty and students. The survey revealed that this tool was effective in augmenting the comfort level of students in scientific poster presentations.*

Key Words: *poster presentations, clinical medicine laboratory, case-based curriculum, education*

Dr. Pagani and Dr. Malloy are assistant professors of optometry at the Pennsylvania College of Optometry. Dr. Pagani is the course coordinator for the Clinical Medicine lecture and laboratory. Dr. Malloy is a laboratory instructor for the Clinical Medicine course. This paper was presented at the 2002 American Academy of Optometry meeting.

Introduction

Poster presentations are becoming a widespread method of disseminating information at many scientific and professional meetings. Most current optometry students will be exposed to this educational format at some point throughout their careers, likely as part of continuing education courses and seminars. In an attempt to increase students' comfort levels not only as observers of, but also as participants in this educational format, we have incorporated a poster presentation assignment into the case-based Clinical Medicine laboratory at The Pennsylvania College of Optometry (PCO). We hypothesized that having a poster presentation, as a required assignment, would help students feel more comfortable presenting a poster at a scientific meeting. This in turn leads to the hypothesis that using the poster format as an educational tool would increase future participation at scientific meetings. These hypotheses were tested by preliminary and follow-up surveys regarding comfort level and anticipated future participation in poster presentations. (Figures 1 and 2)

It seems that very few graduate or professional students receive training or gain any experience on how to prepare and/or present a poster at a scientific meeting.[1] This may be the reason why relatively few professionals participate in the poster presentations at scientific and professional meetings. In an attempt to increase participation at scientific meetings both among current students, and future optometrists, we decided to integrate a poster presentation session into the third-year coursework at PCO. It is hoped that this assignment, which gives all students experience with the poster presentation format, will increase future contributions to scientific poster sessions across the board, regardless of mode of practice.

Methods

One hundred and forty-seven third year optometry students in the Clinical Medicine laboratory are assigned into groups of 3 to 4 students per case study for a total of 10 cases for each of four laboratory sessions. Each group meets in the laboratory for three two-hour sessions. During the first session, the group receives a clinical case including comprehensive medical history, ocular examination results, and visual field test results. The group is provided with information that they would gather on an initial ophthalmic visit as though they were actually examining the patient. At the end of the first meeting session, the group is required to submit a complete assessment and plan for the patient. Included in the assessment and plan are treatment modalities, ordered diagnostic laboratory testing, and a list of differential diagnoses. It should be noted that each case contains ocular findings that are sequellae of a systemic disease or condition.

In the second meeting session, the group receives the results of the laboratory testing for the particular case study. These results consists of complete blood work, chemistry panel, immunology tests, urinalysis, lung function, ECG, CT/MRI, MRA, intravenous fluorescein angiography, and any other laboratory tests that are pertinent for their patient. Using these results, the group comes up with the final ocular and systemic diagnosis for their patient, and links them with other related findings in the patient's history and examination findings. Additionally, students are able to perform a battery of laboratory tests on themselves to increase their hands on experience with some of the testing.[2] Between the second and third meet-

Figure 1: Survey

Third Year - Winter Quarter Clinical Medicine II Laboratory Survey

Preliminary Survey Questions
Please circle Y or N to indicate a YES or NO response to the following questions.

1. Have you ever attended a Poster Presentation Session at a Scientific Meeting?	Y	N
2. Have you ever directly participated in a Poster Presentation Session at a Scientific Meeting?	Y	N
3. At this point, would you feel comfortable participating in a Poster Presentation Session at a Scientific Meeting?	Y	N
4. Can you see yourself participating in a Poster Presentation Session at a Scientific Meeting within the next 5-10 years?	Y	N
5. If your training included experience with a scientific poster format, do you feel that you would be more likely to participate in a Poster Presentation Session at a Scientific Meeting?	Y	N

Figure 2: Post-Program Survey

Clinical Medicine Laboratory Post-Program Survey
Third Year Students: Winter Quarter

1. Have you attended a poster presentation session at a scientific meeting?	Y	N
2. Have you ever directly participated in a poster presentation session at a scientific meeting?	Y	N

KEY:	(5) Strongly Agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly Disagree
3. Did this laboratory poster session instruct you on the format needed to develop a poster?	5	4	3	2	1
4. Did you find this exercise to be a good educational tool?	5	4	3	2	1
5. Following the Clinical Medicine Laboratory exercise, would you feel more comfortable presenting a poster at a scientific meeting?	5	4	3	2	1
6. Following the Clinical Medicine Laboratory exercise, would you be more likely to present a poster at a scientific meeting?	5	4	3	2	1

ing sessions, the group has to compose an abstract based on their case. This abstract is e-mailed to one of the instructors. The abstract must include the title of the poster, authors' names, appropriate background, case report, and conclusion. We read the abstract and decide if it is acceptable. Acceptability is judged according to whether the students correctly interpret the laboratory results, accurately diagnose their patient, write the abstract in a grammatically correct and professional format, and adequately state the information that will be included in the poster. We ask that the posters focus on the pertinent laboratory testing for the case due to the nature of the Clinical Medicine course. We alert the group of the status of the abstract via return e-mail. If the abstract is deemed acceptable, the group may then begin to work on putting together the poster presentation, which will be displayed during the third meeting session. If the abstract is found to be unacceptable, critiques and suggestions are made to the group, and they must revise and resubmit their abstracts promptly. This process is repeated as often as necessary until all of the abstracts meet the criteria and are considered to be at an acceptable level.

During the first and second meeting sessions, faculty posters from presentations at recent scientific meetings are available for students to evaluate the set-up, content, and process involved in preparing a poster. After their abstract is accepted, the group completes the necessary research to formulate their poster. Then, in the third meeting session, the groups come with their completed materials ready to present their poster. Each laboratory section is divided into ten cases. During this two-hour laboratory session, the poster presentations are divided into two groups. Those with cases numbered 1 through 5 display their posters first. Each group is supplied with a standing corkboard (4′ x 3′) on which they may tack any components of their poster. The remaining half of the laboratory section serves as the "audience" in this setting. They walk around and read each of the posters and take the opportunity to ask any questions. Both of us (the instructors) are responsible for the grading of the posters. Each instructor is responsible for grading half of the posters. One of us takes the odd numbered cases, and the other takes the even-numbered cases. This way, each of us has to grade 2-3 posters during a 45-minute period. This allows adequate time to read the entire contents of each poster, and to ask the students questions about their case presentation, laboratory results, research, and conclusions. The posters are graded in four main areas. These include the areas of organization, clarity of purpose, content, and research validity. (Figure 3) After the first group of poster presentations is complete, the students remove their posters, and groups with cases numbered 6 through 10 put up their posters. Again the half of the laboratory section that just completed their poster presentation now acts as the "audience" for the second group of presenters.

Another important component of the evaluation process is the peer evaluations. (Figure 4) Peer evaluations give the students the opportunity to evaluate the other members of

Figure 3: Scientific Program Evaluation

CLINICAL MEDICINE LABORATORY
Third Year Students: Winter Quarter

Case number_____ Section _____
Names: _____
_____
_____

Problem Oriented Medical Record Assessment and Plan: _____ pts/ 5 pts
Scientific Problem Abstract: _____ pts/ 5 pts
Poster Session: _____ pts/10 pts

	Weak	Expected	Strong
Organization	○	○	○
Clarity of Purpose	○	○	○
Content	○	○	○
Research Validity	○	○	○

Comments: _____
_____
_____

Total Points: _____pts/20 pts

Figure 4: Peer Evaluation

Please evaluate the performance of each of your group members throughout this exercise. In your evaluation should be included their effort and contribution to the case analysis, abstract preparation, literature review, and poster content and appearance. Please rank each group member on a scale of 1-5, with 1 being little or no contribution, and with 5 being exceptional effort and contribution.

Group Member being evaluated: _____
Case #: _____ Section: _____

1	2	3	4	5

Please provide comments to support any evaluation (especially a 1 or a 5).

their group. This task demonstrates how much each of them contributed to the overall compilation of the posters. The students complete these evaluation forms at the beginning of the laboratory session. When they enter the room, they are given the forms and asked not to sit with the other members of their group. This request is made so that the students can evaluate each other openly and honestly without pressure by those seated around them. The students are asked to back up any extreme assessments (either high or low) with supporting comments. When taking this information into account, we check for consistency among all group members. If all group members feel that an individual's contribution is lacking, this information is taken into consideration in the student's final grade.[3] The laboratory portion of the Clinical Medicine laboratory is worth 20 percent of the final grade for the Clinical Medicine course. This is broken down into 5 possible points for the assessment and plan, 5 possible points for the abstract, and 10 possible points for the poster presentation.

Results

The poster presentation format proved to be a positive experience for both the students and the instructors. For us, it was an educational and enjoyable way of conducting the laboratory. Prior to this assignment, 63% of the students had never attended a poster session, and 84% had never directly participated in a poster session at a scientific meeting. (Figures 5 & 6) The results of the preliminary survey (n=69) indicate that only 19% of students would have felt comfortable presenting a poster prior to this experience. (Table 1) Upon completion of this assignment, 62% of the students reported that their comfort level for presenting a poster had increased. (Figure 7) This result supports our initial hypothesis that this educational endeavor would increase the students' comfort level with a poster presentation format. Seventy-eight percent of the students agree that the assignment instructed them on the format for poster presentations, while 7% disagree. (Figure 8) Forty-seven percent of the students believe this procedure is a good educational tool and 21% disagree. (Figure 9) This result may be due to the amount of work involved in generating the end product of the poster. The survey results did not fully support our second hypothesis that this assignment may increase participation in poster presentations at future scientific meetings. Thirty-five percent of respondents agree they would be more likely to present in the future, 38% were neutral, and 27% felt the assignment did not influence the likelihood of presenting in the future. (Figure 10) To complete the assessment of this hypothesis, we would need to look at scientific poster presentation sessions in 3-5 years to see if more PCO-graduated optometrists were presenting than in the past.

Discussion

A review of the literature revealed that using the poster presentation format as an educational tool is not being done in any other optometry or medical programs to the best of our knowledge. We could only find a small number of medical schools that offer voluntary participation in a poster presentation format as part of a contest or competition. There was no mention, however, of incorporating a scientific poster session into the optometry or medical based curricula. Interestingly, we did find documentation of the use of poster presentations as a teaching tool in some undergraduate settings. These are primarily in basic science areas of physiology, biochemistry, chemistry and biomathematics.[4-6] This educational format is also documented in the business area of marketing. However, the field of nursing seems to be the area where

Table 1: Results of Clinical Medicine Laboratory Preliminary Survey

QUESTIONS	YES	NO
1	18	51
2	6	63
3	13	54
4	25	44
5	39	30

Table 2: Results of Clinical Medicine Laboratory Post-Program Survey

QUESTIONS	MEAN	STANDARD DEVIATION
3	3.91	0.82
4	3.33	1.03
5	3.64	0.90
6	3.04	1.08

Figure 5: Have You Attended a Poster Presentation Session at a Scientific Meeting?

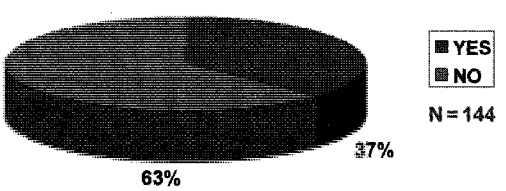
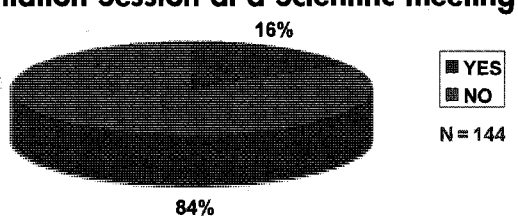


Figure 6: Have You Ever Directly Participated in a Poster Presentation Session at a Scientific meeting?



using a poster presentation as a teaching tool is the most widespread.[7]

It is interesting to compare our experiences in using poster presentations as a teaching tool with some others in the literature. For example, we assigned students to groups alphabetically. One downfall with this method of group assignment is that this is the way that students are usually paired or grouped at PCO. Therefore, students tend to work with the same partners for many different assignments throughout their stay at PCO. This may be either an advantage or a disadvantage depending on whether or not the students work well together. We did actually run into a few cases where this was a problem. An alternative that was used at SUNY (Buffalo) undergraduate biology department was to group students according to performance on previous tests.[4] They put all of the strongest students in separate groups. Similarly, they also evenly distributed the weaker students as well. They did this to level out the competency of the groups. We, however, do not feel that this method would be suitable for a graduate optometry program. Firstly, there are so many different criteria on which students could be based. For example, we could base the groupings on basic versus clinical science performance, or on didactic versus practical performance. Also, we feel that at this level, the responsibility of assignment would be better left to the students. In the future we may consider letting the students choose their own groups. However, we can foresee some potential problems with this method as well. There will invariably be one or two students who are not included in any group. Therefore, we may instead try to randomly mix the students into groupings within the laboratory section so they are not working with all of the same students with whom they work in other laboratories.

Another comparison that can be made is in the area of peer evaluation. We only found one other institution in the literature that mentioned using this type of evaluation in the final grading process, this again was the SUNY (Buffalo) undergraduate biology department.[4] As mentioned earlier, the method that we used to conduct this peer evaluation was to have each student assess each other member of the group on a scale of 1-5. This evaluation reflects the student's total contribution to the group throughout the entire assignment. Any extreme assessment of a 1 or a 5 is to be supplemented by supporting comments. The method in the SUNY (Buffalo) biology department had each group member assign a number of points to each of the other group members, representing the portion of the work that was contributed by each member. In other words, excluding themselves, they needed to break down the distribution of participation. One downfall with this method is that this leaves no room for the student to voice the opinion that they feel that they did most of the work. Also, it does not allow for the fact that too much contribution by one group member may actually have a negative influence. In fact, one student may disregard the opinions of the group and proceed in completing more than his or her share of the project. Both of these concerns did surface in our peer evaluations. Therefore, we would probably leave our peer evaluation unchanged at this point. We feel they are a very valuable tool in this, and many other group projects.

Another comparison was made in

Figure 7: Following the Clinical Medicine Laboratory Exercise, Would You Feel More Comfortable Presenting a Poster at a Scientific Meeting?

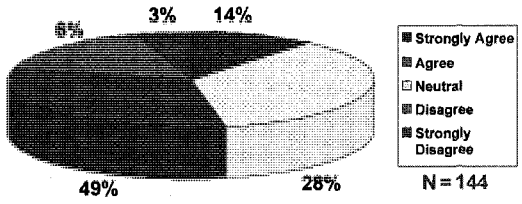


Figure 8: Did This Laboratory Poster Session Instruct You on the Format Needed to Develop a Poster?

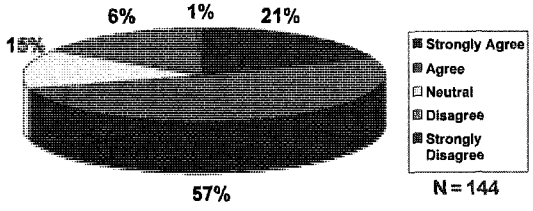


Figure 9: Did You Find This Exercise To Be a Good Educational Tool?

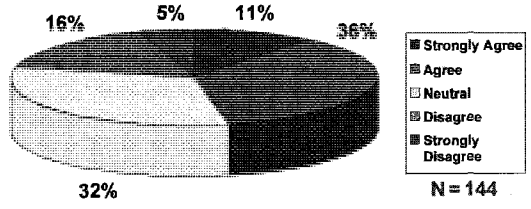
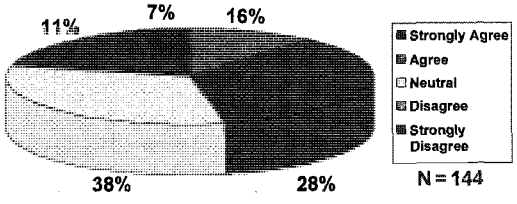


Figure 10: Following the Clinical Medicine Laboratory Exercise, Would You Be More Likely To Present a Poster at a Scientific Meeting?



the use of the students' oral defense of their poster. At SUNY (Buffalo), each student must defend the poster on an individual basis.[4] This ensures that one student does not do all of the work, or more specifically all of the verbal communication. This method is appropriate for an undergraduate course. However, we feel that this is not necessary at the professional school level. We prefer to make this as valid a scientific poster presentation as possible. As is the case at a typical poster session, the questions are fielded by all of the authors. The authors are there to help each other during the oral defense. Remember that one of our goals is to increase interest in, and participation at, poster presentations. We do not want the students to feel any unnecessary pressure in this setting.

Another important difference between our format and that at another school (North Carolina State - biomathematics department) is the poster evaluation criteria.[5] Whereas we used 4 criteria, they used 17 criteria to evaluate each poster. They admitted that time was indeed a problem that was encountered. Actually, they were evaluating 17 aspects of 17 different posters within a 3-hour period. We found that our schedule worked very well, and time was not a factor. We had 4 different laboratory sections that participated in the poster sessions separately. Each section was then divided into 2 groups so that only 5 of the posters were presented simultaneously for approximately 45 minutes. Then, the groups switched, and the other 5 posters in that laboratory section were displayed for the next 45 minutes. This allowed ample time to read and evaluate all of the posters, especially with two evaluators, who were responsible for grading only half of the posters. We find that 4 criteria for this evaluation worked well. Any more than that would be difficult to attend to in an efficient and accurate manner.

The biomathematics department at North Carolina State also used a survey to evaluate students' opinions regarding the educational experience of the poster assignment.[2] Quite similar to our follow-up survey, they asked students to rate the assignment on a scale from 5 - 1, with 5 being strongly agree, 3 being neutral, and with 1 being strongly disagree. When asked to respond to the statement that the poster session was a valuable experience, the class of 14 students answered with a mean of 4.64 and a standard deviation of 0.17. Overall, therefore, the students in the biomathematics course at NC State appreciated the use of the poster format. Correspondingly, the 144 respondents of our survey at PCO as a group appreciated the use of the poster format. (Table 2) When asked to respond to the statement that the poster session instructed them on the format needed to develop a poster, they replied with a mean of 3.91 and a standard deviation of 0.82. The mean was 3.64 in response to the statement that this format would make them feel more comfortable presenting a poster at a scientific meeting. When asked if the exercise was a good educational tool, the optometry students responded with a mean of 3.33. Therefore, the use of a poster session as an educational format seems to be well received by students in both an undergraduate and a graduate setting.

Additionally, the poster presentation is a way to assess and strengthen students' communication skills. The preparation of the poster stresses the importance of effective and professional written communication skills. Likewise, the oral defense of the

Continued on page 139

Binocular Vision and Pediatric Optometry Clinical Faculty Roles: A Comparison

Bill B. Rainey, O.D., M.S., F.A.A.O.
David A. Goss, O.D., Ph.D., F.A.A.O.

Abstract

Clinical education and patient care in optometric specialties at optometry schools are typically provided by faculty with additional training, expertise, experience, and interest in that specialty. Many schools make use of faculty with clinical rank appointments to provide these services. This survey was conducted in an effort to compare binocular vision and pediatric optometry clinical faculty roles at the various optometry schools. Members of the Binocular Vision and Perception Educators ASCO SIG e-mail list were surveyed, and responses were received from faculty of 13 of the 17 ASCO schools. The results of this survey reflected a large degree of variability in the assignment and use of clinical faculty in this specialty. In addition, there were significant differences among the schools in student clinic requirements and overall faculty coverage in these specialty clinics. In order to continue a high level of clinical education in Binocular Vision, Vision Therapy, and Pediatric Optometry, including the development of postgraduate residency programs, a strong clinical faculty in these areas is necessary.

Key words: *clinical education, clinical faculty, pediatric optometry, binocular vision, vision therapy, specialty clinics*

Introduction

Optometry schools are continuously updating and revising their curricula to meet the ever-expanding demands of the profession.[1-3] Optometry students are expected to demonstrate entry-level competency in a wide variety of personal and professional areas upon graduation,[4] and the challenge is to adequately prepare students to meet this entry-level competency in the 4-year curriculum.

A key to successfully meeting this challenge is a knowledgeable and diverse faculty. Many faculty who teach in clinical courses and who provide patient care could be considered primary care clinicians, and may not have a specific area of clinical interest or expertise. Other faculty may have additional interest, expertise, training, and experience in a particular specialty area, and these faculty may be very involved in the didactic and clinical education of optometry students in these areas.

In addition to diversity in clinical interest, faculty take on different scholarly roles in the academic setting. For example, schools may use clinical rank faculty appointments to allow some faculty to focus on patient care education. This would presumably be one way to enhance clinical education. According to the Indiana University School of Optometry *Promotion and Tenure Guidebook,* the main responsibilities of these clinical rank faculty "lie in the areas of patient-related services, clinical teaching and supervision of student clinicians."[5] This is very different than the role of tenured/tenure-track faculty whose primary scholarly and creative activity usually revolves around research, publication, and didactic classroom teaching. Of course, different universities evaluate faculty performance in different ways, and schools of optometry are trying to find ways to appropriately reward the special scholarly activity of clinical educators.[6]

Since faculty at schools of optometry are involved in clinical education in a variety of ways, with clinical faculty possibly having different levels of involvement at each school, it would be useful to compare the roles of clinical faculty, especially in specialty clinic services. To assist in this comparison, a survey of clinical faculty in Binocular Vision, Vision Therapy, and Pediatric Optometry was conducted. This paper reports the results of that survey.

Methods

Binocular Vision and Pediatrics faculty were surveyed to gather information about clinical education in this specialty. The survey (Appendix) was sent via e-mail to all members of the Binocular Vision and Perception Educators ASCO Special Interest Group (SIG). This group of educators, which first organized and met in 1983, became an ASCO SIG in 1998.

The BVPE SIG, in addition to meeting at least twice a year, maintains regular communication among members through a LISTSERV e-mail mailing list.[7] This list, which began in March of 2000, currently consists of 128 members. All 17 ASCO member schools are represented on this mailing list. The LISTSERV email mailing list has been an excellent way for members to communicate between meetings and has generated discussion on a wide variety of topics. Because of the positive electronic interaction among group members, it was felt this list would be a good way to distribute a survey among BVPE faculty.

Drs. Rainey and Goss are Binocular Vision/Pediatrics faculty of the Indiana University School of Optometry. Dr. Rainey is assistant professor of optometryand Dr. Goss is professor of optometry.

Table 1
Summary of Data Collected from Each School

School	BV/VT and Peds separate or combined?	Student hrs/wk in BV/VT/Peds (third year)	Student hrs/wk in BV/VT/Peds (fourth year)	Does school have "Clinical Rank"?	Number of BV/VT/Peds Clinical Rank Faculty	Person-days/wk BV/VT/Peds faculty coverage	Does clinic offer in-office VT?
1	combined	0	4	no	0	12	yes
2	separate	5	2.5	no	0	12.5	yes
3	separate	2	10	no	0	15	yes
4	combined	0	2.7	yes	0.5	5	yes
5	separate	0	4	yes	1	8	yes
6	separate	1.2	10.3	yes	2	7	yes
7	separate	0	3.7	yes	2	8.5	yes
8	combined	0	4	yes	2	16.5	yes
9	combined	1	4	yes	4	3	yes
10	combined	4	16	yes	4	5	yes
11	combined	0	5	yes	4	16.5	yes
12	combined	4	1.3	yes	6	not reported	yes
13	separate	2	6	yes	26	15	yes
mean	7 combined	1.5	5.7	10 yes	4.0	10.3	all yes
sd	6 separate	1.8	4.1	3 no	6.9	4.8	
median		1	4		2	12	
range		0 - 5	0.5 - 16		0 - 6 (26)	3 - 16.5	

The Binocular Vision and Perception Educators Clinical Faculty Survey was sent through e-mail to all BVPE members, with a request that the Chief of Binocular Vision/Vision Therapy/Pediatrics complete and return the survey through e-mail. A follow-up e-mail message was sent two weeks later to representatives of the schools that had not yet replied.

Because specific information may be considered to be sensitive by some, the last question on the survey asked if the respondent would prefer that his/her school not be identified in any resulting publications. If anyone answered yes, the results would be kept anonymous.

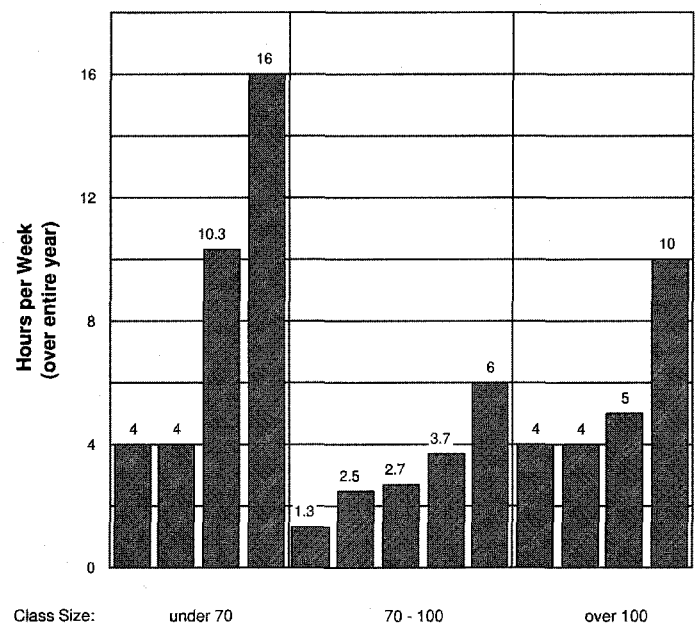
Results

After the original e-mail survey and the follow-up request, responses were received from BVPE SIG members at 13 of the 17 ASCO schools. Table 1 summarizes the responses. Because at least one respondent did not want his/her school to be identified, no school names are listed.

Schools may use different names for their specialty clinic services. Some schools may have a Binocular Vision (BV) Service, some schools may have a Vision Therapy (VT) Service, some schools may have a separate Pediatric Service (Peds). In fact, of the schools that responded to the faculty survey, seven had a combination of these services, and six had a separate Pediatric Service. For the purposes of this survey summary, we grouped all of these services into a single BV/VT/Peds specialty.

As seen in Table 1, most of the student clinical experience in BV/VT/Peds occurs during the fourth year, although third year students were

Figure 1
Fourth Year Student BV/Peds/VT Clinic Assignment (number of hours per week averaged over entire fourth year)



assigned for some amount of time at several schools. At some schools, the actual BV/VT/Peds fourth year assignment may only occur during part of the year, since some rotations may not have a concentrated experience in this specialty. In order to make the most accurate comparison among schools, student assignments were averaged over the entire year (48 weeks).

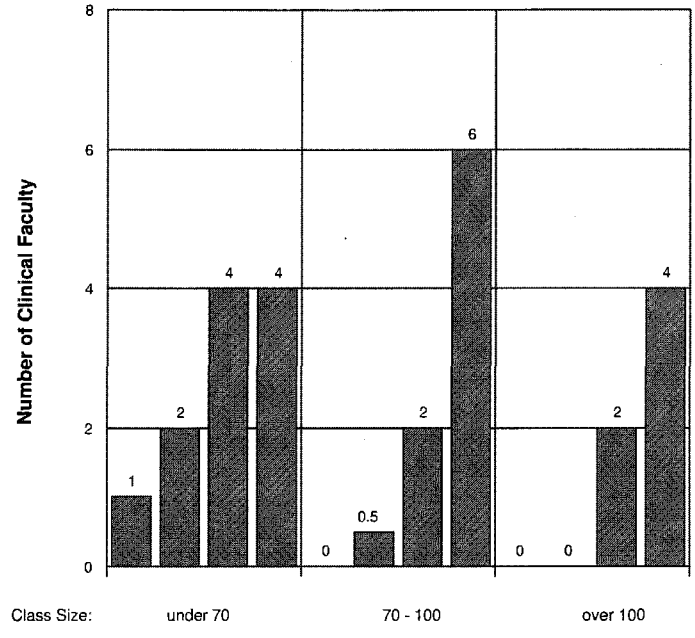
Since numbers of assigned faculty are related, in part, to class sizes, the schools were divided into 3 groups according to class size for some of the comparisons. Class sizes published on the ASCO web site (www.opted.org) were used for these groupings. Four of the schools have fewer than 70 students in each class, five of the schools had between 70 and 100 students per class, and 4 of the schools had over 100 students per class, so this fairly evenly divided group classification was used.

The number of hours each student was assigned to BV/VT/Peds per week varied considerably among schools (Fig. 1). The smallest assignment was 2.5 hours per week, or a total of 120 hours over the entire year. The largest assignment was 16 hours per week, or a total of 960 hours. Students at 6 of the 13 schools were assigned for 4, 5, or 6 hours per week. As can be seen in Fig 1, the class size did not seem to affect these assignments.

Ten of the 13 schools used clinical rank faculty members. The number of clinical rank faculty members assigned to BV/VT/Peds also varied among schools (Fig. 2). One school reported having 26 clinical faculty assigned to BV/VT/Peds. Because this number was extreme, and was much higher than any other schools reported, it was not included in Fig. 2 or in the summary statistics in Table 1. The differences among schools in numbers of clinical rank faculty were similar for all class size groups.

The survey also asked for the total number of 'person-days' of faculty coverage per week in BV/VT/Peds. Since this number was a combination of the number of assigned faculty and the number of days per week of actual clinic operation, it gives an overall indication of the extent of clinical instruction in this specialty. Again, the results varied considerably among schools (Fig. 3). As one might expect, schools with larger class sizes had more clinic coverage. However, there were large differences among the schools in each of the first two class size groups.

Figure 2
Number of FTE BV/Peds/VT Clinical Faculty (Schools Grouped in Categories of Class Size)



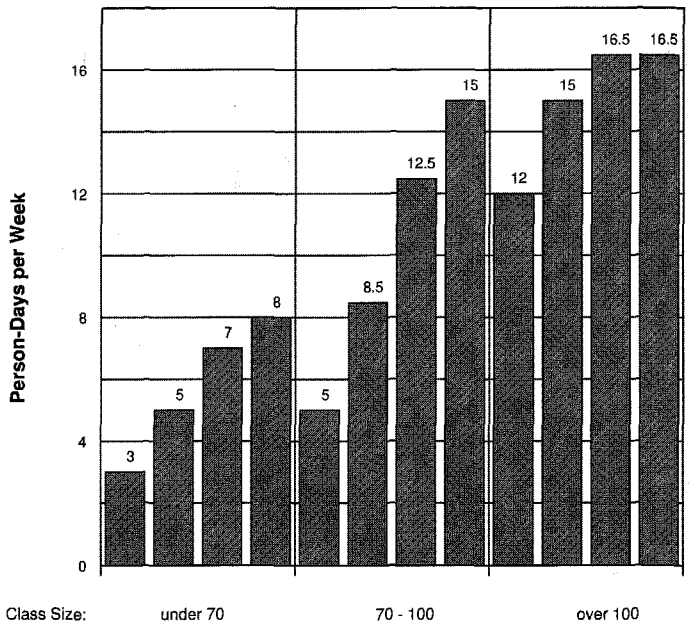
Discussion

The primary mission of schools and colleges of optometry is to produce highly qualified professionals who demonstrate entry-level competency in all aspects of clinical practice. However, historically, different optometry schools have had different areas of emphasis in their curricula.[8] And, it seems that the composition of clinical faculty also varies among schools, at least in the area of Binocular Vision and Pediatrics. As optometry schools update and revise their curricula, it would be useful to re-evaluate the assignment of faculty involved in clinical education.

There is a wide range of student clinical experience, assigned clinical faculty, and clinic coverage in BV/VT/Peds. This may result in graduates with different skill levels in this specialty area. Although optometry schools should maintain their uniqueness and diversity, there should also be some consideration of minimum faculty assignments that allow for the best possible clinical training and patient care. A curriculum model[9] has been proposed for the area of BV/VT/Peds, and sufficient clinical faculty are necessary to adopt and implement this model. This curriculum model could also be a component in the determination of the minimum number of faculty needed.

Along with other clinical topics, some areas of the optometric curriculum related to BV/VT/Peds have been or are being compressed or eliminated during the ongoing curriculum revision process at many schools of optometry. Rouse and Applebaum[10] outlined several important reasons for retaining the vision therapy and functional binocular vision curriculum, including the high prevalence of functional vision disorders, the optometric tradition of "vision" care as opposed to "eye" care, the inclusion of vision therapy in optometry state laws and third party reimbursement policies, and the formal recognition of optometric vision therapy by professional organizations such as the American Optometric Association and the American Academy of Optometry.[11,12] Rouse and Applebaum also point out the importance of postgraduate clinical education in vision therapy, primarily in the form of accredited residency programs. The continued inclusion of BV/VT/ Peds in the four-year optometry curriculum and the development of related optometric residency programs require a strong faculty with interest, expertise, training, and experience in this important optometric specialty area.

Figure 3
BV/Peds/VT Clinic Coverage (Person-Days per Week)



Since the primary role of clinical rank faculty is in clinical education and patient care, these types of faculty appointments are extremely valuable. Tenure-track faculty should also be involved in clinic, and can provide unique perspectives and insight. Clinical rank faculty can devote the time and effort necessary to develop the clinical program, and to provide high quality clinical education and patient care, and can work alongside tenure-track faculty to provide the optometry student with a more complete clinical experience. This diversity of faculty can only serve to strengthen the professional program.

References

1. DiStephano AF, Dayhaw-Barker P, Oleszewski S, Dell WM. The Pennsylvania College of Optometry transforms its curriculum for the preparation of 21st century optometrists. Optom Educ 2001;27(1):11-9.
2. Harris MG, Kashani S, Saroj N. An evaluation of the new curriculum at the University of California, Berkeley, School of Optometry. Optom Educ 2001;26(3):83-7.
3. Kaplan H. The changing faces of optometry. Optometry 2000;71(1):9-11.
4. Heath DA, Daum KM, Di Stephano AF, Haine CL, Schwartz SH. Attributes of students graduating from schools and colleges of optometry - An ASCO report. Optom Educ 2000;26(1):15-8.
5. Indiana University School of Optometry. *Promotion and Tenure Guidebook.* Office of Associate Dean for Academic Affairs, January 1999.
6. Wilson R. Revisiting scholarship for clinician educators. Optom Educ 2001;26(2):36.
7. Rainey BB. An electronic community of vision therapy educators. J Behavioral Opt 2001;12(2):39-40.
8. Bamberg HM, Grenier EM, Harris MG. An evaluation of U.S. optometry school curricula. Optom Educ 1998;23(2):41-7.
9. Association of Schools and Colleges of Optometry Committee. Curriculum model for oculomotor, binocular, and visual perceptual dysfunctions. J Optom Educ 1988;13(3):95-103.
10. Rouse MW, Applebaum M. The future of vision therapy in optometric education. J Behavioral Opt 1990;1(8):212-4.
11. American Optometric Association. Position statement on vision therapy. J Am Optom Assoc 1985;56(10):782-3.
12. American Academy of Optometry, American Optometric Association (Joint Statement). Vision Therapy: Information for Health Care and Other Allied Professionals. Opt Vis Sci 1999;76(11):739-40.

Appendix

Binocular Vision and Perception Educators Clinical Faculty Survey

1. School:
2. Is your vision therapy/binocular vision clinic separate from or combined with your pediatric optometry clinic? Please explain.
3. How many person-days of faculty coverage do you have per week in vision therapy/ binocular vision (and pediatrics if it is combined with VT/BV)? (Examples: Two faculty on a Monday afternoon would be one person-day. One faculty member all day on Monday would be one person-day.)
4. How many hours per week, and in how many semesters/quarters, are your students required to be in BV/VT/Peds clinic in their third year? (Please give numbers separately for BV/VT and for Peds if they are separate clinics)
5. How many hours per week, and in how many semesters/quarters, are your students required to be in BV/VT/Peds clinic in their fourth year? (Please give numbers separately for BV/VT and for Peds if they are separate clinics)
6. Do you have a program of in-office vision therapy?
7. Does your school have clinical rank faculty members?
8. How many clinical rank faculty members do you have in VT/BV/Peds?
9. Do you prefer that your school NOT be identified if we publish the results of this survey? (If anyone says yes, we will not identify any of the schools in print)

Automated External Defibrillators at Clinical Outreach Sites: Should Students Be Trained To Use Them?

James LaMotte, Ph.D., O.D., F.A.A.O.
John Nishimoto, O.D., M.B.A., F.A.A.O.

Abstract

Studies have shown higher survival rates from cardiac arrest when an automated external defibrillator (AED) is used immediately after a witnessed event. To assess the need for AED training at the Southern California College of Optometry, we surveyed supervisors at 86 sites for outreach clinical training. The survey asked about access to an AED and about training in the use of an AED. Of 49 respondents to the survey, 38 said there was one accessible from the eye clinic. Because outreach students are likely to be present where an AED is available for use, it is recommended they receive training in these devices.

Keywords: *Defibrillator, AED, CPR, outreach clinic*

Drs. LaMotte and Nishimoto are affiliated with the Southern California College of Optometry. Dr. LaMotte is a professor in basic sciences and is a CPR instructor. Dr. Nishimoto is an associate professor and directed the Outreach Program for several year.s.

Introduction

Nearly everyone knows that CPR stands for cardiopulmonary resuscitation, and millions know how to administer the procedure. Now a new acronym for lifesaving is vying for public awareness. The letters AED stand for automated external defibrillator and the device is receiving growing attention outside the medical community as a device to save victims of heart attacks.

Most people have an exaggerated idea of the effectiveness of CPR.[1] A survey of nearly 300 people showed that 96% guessed that CPR saved the victim's life 65% of the time. In fact, the actual effectiveness of CPR is much lower. According to a survey of 2,329 cases of out-of-hospital cardiac arrest in New York City, 32% received CPR from bystanders.[2] Unfortunately, the survival rate of the victims receiving CPR was only 2.9%. This is still more than triple the 0.8% survival rate for the victims who did not receive any CPR before arrival of paramedics, but the reality is that over 97% of people who received CPR still died.

Some feel that portrayal of heroic rescues by the entertainment industry has led to an unrealistic idea of the effectiveness of CPR[3] and certainly the low survival rate of CPR is not well known.

The procedures for cardiopulmonary resuscitation are meant to circulate oxygenated blood to vital organs when a heart in cardiac arrest stops effectively pumping blood to vital organs including the heart and lungs.[4] Lack of blood flow to the brain for more than 5 to 10 minutes usually results in permanent brain damage. Thus, CPR plays an important role during cardiac arrest but can only forestall damage to vital organs until the heart can be defibrillated back to a normal rhythm.[5]

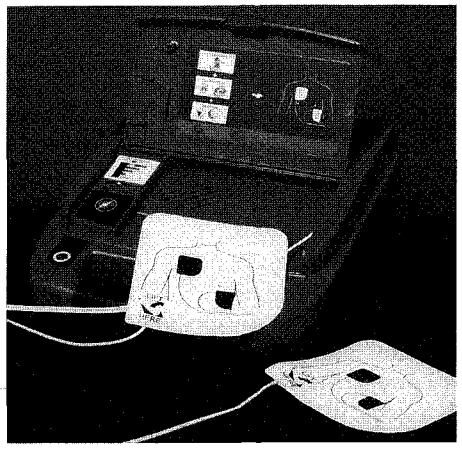
The lethal arrhythmia called ventricular fibrillation usually accompanies cardiac arrest. Ventricular fibrillation associated with coronary disease results in at least 225,000 deaths in the United States each year.[6] A normal heart rhythm can often be restored by the relatively simple and quick procedure of sending an electrical current through the heart. This is accomplished in the process of defibrillation by applying several thousand volts for a few milliseconds through electrodes applied to the chest wall.[7] The heart usually reverts to a normal rhythm in 3 to 5 seconds. Data from animal and human studies show that defibrillation immediately after witnessed ventricular fibrillation results in survival rates greater than 90%.[8]

Thus, defibrillation is the definitive therapy for ventricular fibrillation, but for a number of years was a skill reserved for emergency care providers with electrocardiographic training and done only in a clinical setting.[9] The development of AEDs made possible the extension of defibrillation capability to minimally trained personnel almost anywhere.

The first AEDs in the early 1980s resulted from advances in computer design which enabled the production of "smart" defibrillators capable of electronically recognizing ventricular fibrillation in a heart attack victim, and advising the operator of the need for a shock.[10] Studies showed these AEDs to be as effective as the manually-controlled defibrillators used in clinical settings and considerably easier to use.

The technology that allowed implantable defibrillators, which analyze rhythm and recognize ventricular fibrillation with a high degree of reliability, provided the means for development of smaller and lighter automated external defibrillators.[11] A

Figure 1



The automated external defibrillator is a compact unit with simplified operating procedures. The two electrode pads that attach to the chest are shown.

major advance in making AEDs more accessible to the public was the development of a small 6.25 lb unit designed for home use.[5] Clinical studies confirmed the safety and efficacy of this small portable unit in termination of out-of-hospital cardiac arrest from ventricular fibrillation.[12, 13] Soon new models and manufacturers entered the field producing AEDs with simpler procedures for use by inexperienced operators (Figure 1).

Rapid defibrillation is important because it has been shown that for every minute that elapses from collapse to defibrillation, the victim's chance of survival drops by 7% to 10%.[11] Therefore, it is not surprising that studies have shown that increasing the number of AEDs accessible to laypersons has significantly increased survival rates. Equipping police with the devices and training the officers in their use increased the rate of survival among victims of cardiac arrest by 26% to 40%[11] American Airlines had similar results when it placed AEDs on all flights and trained 24,000 of its flight attendants.[14] Perhaps the highest rate of survival was reported in a Las Vegas casino in which 53% of victims survived cardiac arrest (74% for those who received their first defibrillation no later than three minutes after a witnessed collapse).[15]

With AEDs placed in an increasing number of public locations, it can be expected that a large number of clinical settings will soon have an AED that is accessible to everyone in that setting. Several optometric colleges have outreach clinical programs that place students at off-campus sites for a number of weeks or months. Since the majority of these sites are in a clinical setting, these students may be in a situation in which an AED is present and may have to be utilized.

To assess the need for AED training at Southern California College of Optometry (SCCO), we investigated the possibility that students would be assigned to an off-campus site that has an AED available.

Methods

We mailed a survey to the supervisors at 86 eye clinics with which SCCO had an agreement for outreach clinician training. These off-campus sites are affiliated with various health care delivery systems such as the Department of Veterans Affairs, United States Public Health Service, military installations, medical and outpatient care centers, health maintenance organizations and specialty optometric offices. Student clinicians are assigned to these off-campus sites during their fourth year at SCCO.

The survey consisted of six questions and a request for comments (Table 1). The first two questions were yes/no to determine the presence of an AED at the site. The first question asked if an AED was in the eye clinic. If the response was no to the first question, the second question asked if an AED was available in a nearby location. The next two questions asked for details about the AED in a nearby location. Question number three asked the location of the nearby AED. Question number four requested an estimate of the time it would take to get an AED and return to the victim. The choices for this question were one-minute intervals from one to seven minutes and 10 minutes.

The last two questions of the survey concerned AED training by individuals at the eye clinic. Question number five simply asked if anyone in the eye clinic had received training in the use of an AED. Question number six asked the supervisors if they thought the student interns should be trained in the use of an AED before coming to their clinics.

Table 1
The Survey Sent to Supervisors at Outreach Clinical Sites

Name of Faculty: _____

Name of Site: _____

1. Does your eye clinic have an AED?

   ☐ Yes ☐ No

2. If no, is there an AED in a nearby location for use in emergency situations?

   ☐ Yes ☐ No

3. If there is an AED nearby, where is it located?

4. How many minutes would you estimate it would take you to get to the AED and return to the victim? *(Please circle appropriate number)*

   1 2 3 4 5 6 7 10

5. Has anyone in your eye clinic received training in the use of an AED?

   ☐ Yes ☐ No

6. Do you think student interns need to be trained in the use of the AED before coming to your clinic?

   ☐ Yes ☐ No

Any Other Comments: _____

_____

Results

Forty nine of the outreach sites responded with completed surveys. Of these, only eight sites reported an AED in the eye clinic itself. But 30 of the eye clinics without an AED reported there was one in a nearby location for use in an emergency situation. Thus, 38 of the 49 eye clinics had an AED available somewhere on-site.

Answers were varied to question number three, which concerned the location of a nearby AED if one was not present in the eye clinic. The most common response (n = 13) was an emergency room, with a crash cart the next in frequency (n = 7). The remaining responses were various locations in the same building such as next door or one flight up or down.

The outreach supervisors responding to question number four averaged 3.2 minutes in their estimate of how long it would take to get an AED and return to the victim. Nine supervisors made an estimate of one minute and another nine estimated two minutes, with six thinking it would take three minutes to bring an AED to a victim. Nine supervisors estimated it would take five minutes or longer to bring the AED.

Only 10 of the 49 responding supervisors answered that someone in the eye clinic had received AED training. Thirty seven of the 49 supervisors felt that student interns did not need training in the use of the AED before coming to their clinic.

A number of those replying to the questionnaire included comments in the section provided. The most frequent comments referred to the perceived need for an AED in their eye clinic and training of student interns in the use of an AED. Many of the supervisors of eye clinics in hospitals or medical centers felt that a medical team with a crash cart was available and could reach the eye clinic quickly, and they preferred to rely on a response from outside the eye clinic. Many supervisors thought that it would be a good idea for student interns to be trained in the use of AED but they did not feel it was a necessity.

Discussion

The fact that the majority of the outreach sites in this survey (78%) had AEDs located in the building is explained by the results showing most of the sites (73%) in this survey involved medical facilities. We would expect that other optometric colleges that place students at off-campus outreach clinical settings would find a similar percentage of the sites have an AED available and, according to predictions and the current trend,[5] that percentage can be expected to rise.

Only eight of the supervisors reported an AED in the eye clinic. This would imply that an AED would have to be retrieved from another location or the eye clinic would have to rely on the response of a medical team with an AED. The clinic supervisors in this survey averaged 3.2 minutes in their estimate of how long it would take to retrieve an AED and bring it to a victim. This means that a procedure, which is 90% effective if administered immediately,8 would be reduced by as much as 32%[11] in most eye clinics. (Some of the supervisors estimated five minutes or more to retrieve an AED, reducing effectiveness by as much as 50%). Lack of a nearby AED in an eye clinic is unfortunate as current AEDs are relatively inexpensive at $2000 - $3000[16] and the under eight-pound unit can be mounted on a wall.

According to our results only about 20% of the eye clinics in our survey had someone trained in use of AEDs. This coincides with the fact that 37 of the 49 supervisors did not feel student interns needed AED training before coming to their clinics. Replies on the comments section indicated that the supervisors felt that nearby medical personnel would operate the AED if an emergency occurred.

Since time to defibrillation of a victim of cardiac arrest is one of the most critical, if not the most important, factor in clinical outcome,[17] the public would best be served if AEDs were widely available and could be used by anyone at the location of a cardiac arrest. Thus, ease of use of AEDs by the public is important to their success.

Ease of use of AEDs has been enhanced by instructional verbal commands from the device, simplified displays and icons to help in proper pad placement. In fact, a recent study[17] showed that an AED could be used properly with virtually no training. In this study the performance of sixth-grade children with no CPR training or experience with the AED was compared to emergency medical technicians (EMT) and paramedics. The sixth graders completed the procedure correctly in an average of 90 seconds while the EMTs and paramedics did the task in an average of 67 seconds. Thus, time to defibrillation for the untrained children was only 23 seconds slower than the trained professionals. Other studies have shown similar results with minimal instruction of both layperson[18] and student nurses.[19] Such results are promising for the concept of public use of AEDs as it appears almost anyone can grab a nearby AED and use it properly, but other issues complicate the use of AEDs by the public.

To receive certification in the use of an AED, the American Heart (AHA) Association requires individuals to take a three and one-half to four-hour course that includes CPR.[20] While the conclusion could be made that an individual could correctly use an AED to defibrillate a victim without such training and certification, to do so may put that individual in jeopardy of legal liability. Recently a coalition, with the AHA as the driving force, has pushed for state laws that require AHA certification (or a nationally recognized course) in CPR and AED use to render an individual immune from lawsuit or other civil liability when performing CPR or using an AED.[21] In the case of the California Good Samaritan law, a 1999 law added conditions for protection (certification in CPR and AED) that did not exist in the previous law.[22, 23] As of 1999, 20 states had passed such so-called limited liability legislation as suggested by the AHA and most other states had drafted such legislation.

Schools of optometry and directors of outreach programs must be aware that student clinicians using an AED without training and certification could subject themselves and their institutions to a lawsuit because they may not have the protection of the Good Samaritan law. Training and certification in CPR and AED use is the best answer to the problem of this legal risk.

Conclusion

Since more than three quarters of the sites to which SCCO students and residents are assigned have an accessible AED, the need for training and certification in the use of these devices seems evident to the authors. This opinion, though, was not supported by outreach supervisors, who seemed to feel they could rely on indi-

viduals outside their eye clinics to administer defibrillation if necessary. Since recent changes in the Good Samaritan law were not well publicized, we feel the supervisors were not aware of the legal implications that could result if students who are not certified ever become involved with operation of an AED. The placement of AEDs in public facilities is bound to increase and even though it appears outreach supervisors may not request it, we feel optometric colleges should train their students to use this lifesaving device.

References

1. How we do CPR may change due to a poor track record. The Wall Street Journal. March 31, 2000.
2. Lombardi G, Gallagher J, Gennis P. Outcome of out-of-hospital cardiac arrest in New York City. JAMA 1994 March;271(9):678-683.
3. Diem SJ, Lantos JD, Tulsky JA. Cardiopulmonary resuscitation on television. N Engl J Med 1996 June;1334(24):1578-1582.
4. Chandra NC, Hazinski MF, eds. Basic life support for healthcare providers. Dallas: American Heart Association, 1997.
5. The American Heart Association in collaboration with the International Liaison Committee on Resuscitation. Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation 2000 August;102(SuppII):I-60-1-76.
6. Eisenberg MS, Mengert TJ. Cardiac resuscitation. N Engl J Med 2001 April;344(17):1304-1313.
7. Guyton AC, Hall JE. Textbook of medical physiology. Philadelphia: W.B. Saunders, 2000.
8. Marenco JP, Wang PJ, Link MS, Homoud MK, Mark Estes III NA. Improving survival from sudden cardiac arrest. JAMA 2001 March; 285(9):1193-1200.
9. Cummins RO, ed. American Heart Association textbook of advanced cardiac life support. Dallas: The American Heart Association, 1997.
10. Kellerman AL, Hackman BB, Somes G, Kreth TK, Linacarol N, Dobyns P. Impact of first-responder defibrillation in an urban emergency medical services system. JAMA 1993 Oct;270(14):1708-1713.
11. Robertson RM. Sudden death from cardiac arrest-improving the odds. N Engl J Med 2000 Oct;343(17):1259-1260.
12. Stiell IG, Wells GA, Field BJ et al. Improved out-of-hospital cardiac arrest survival through the inexpensive optimization of an existing defibrillation program. JAMA 1999 April;281(13):1175-1181.
13. Jaggarao NSV, Heber M, Grainger R, Vincent R, Chamberlain DA, Aronson AL. Use of an automated external defibrillator-pacemaker by ambulance staff. Lancet 1982 July;2:73-75.
14. Page RL, Joglar JA, Kowal RC, et al. Use of automated external defibrillators by a U.S. airline. N Engl J Med 2000 Oct;343(17):1210-1216.
15. Valenzuela TD, Roe DJ, Nichol G, Clark LL, Spaite DW, Hardman RG. Outcomes of rapid defibrillation by security officers after cardiac arrest in casinos. N Eng J Med 2000 Oct;343:1206-1209.
16. Coming soon: a defibrillator near you. Orange County Register July 2, 1998.
17. Gundry JW, Comess KA, DeRook FA, Jorgenson D, Bardy GH. Comparison of naive sixth-grade children with trained professionals in the use of an automated external defibrillator. Circulation 1999 Oct;100:1703-1707.
18. Moore JE, Eisenberg MS, Cummins RO, Hallstrom A, Litwin P, Carter W. Layperson use of automatic external defibrillation. Ann Emerg Med. 1987;16:669-672.
19. McKee DR, Wynne GE, Evans TR. Student nurses can defibrillate within 90 seconds: an evaluation of a training program for third year student nurses in the use of an automatic external defibrillator. Resuscitation. 1994;27:35-37.
20. Emergency cardiovascular care programs. http://www.cpr-ecc.org/laycourses.html.
21. SoRelle R. States to pass laws limiting liability for lay users of automated external defibrillators. Circulation 1999 May;99:2606-2607.
22. California Civil Code sec.1714. 21(a)(b).
23. California Health and Safety Code sec. 1799.102.

Optometry Students' Attitudes about Nursing Home Rotations

Jimmy H. Elam, O.D., Ed.D., F.A.A.O.

Abstract

Students at Southern College of Optometry go to nursing homes as part of their clinical training. This study was undertaken to ascertain students' perceived value of their nursing home rotations. Fourth year and third year student clinicians reported that their nursing home rotations were a valuable clinical learning experience. Students thought that their nursing home rotation was worthwhile and that they increased their clinical skills and knowledge. Results from this study may serve as an indicator of the value of expanding nursing home clinical training programs in optometry schools nationwide.

Key Words: *Clinical teaching, health facilities, nursing homes, long term care, educational gerontology*

Dr. Elam is associate professor and director of the Nursing Home Program at the Southern College of Optometry.

Introduction

Students in optometry schools characteristically rotate through several clinical services, such as Adult Primary Care, Pediatrics, Low Vision Rehabilitation, and others, to obtain clinical experiences to prepare them to practice after graduation. Clinical learning experiences are obtained at both on-campus and off-campus clinics.

Among the clinical learning exposures of students at Southern College of Optometry (SCO) is a rotation in the Nursing Home Program (NHP). Students obtain clinical exposure by assisting a clinical professor in the examination, diagnosis, and management of vision/eye conditions of long-term care facility residents at 12 Memphis area nursing homes. Typically, one fourth year and one third year student work as a team, with the fourth year student acting as team-leader.

To assess student perceptions of the effectiveness and learning value of the NHP clinical program, a questionnaire (Appendix) was given to fourth year and third year students. The purpose of this paper is to describe the results of that survey and to offer comments regarding optometric clinical training in long-term care facilities.

Methods

A cohort of fourth year and third year SCO students was administered an investigator-generated questionnaire relating to their nursing home clinical learning experiences during the 2001-2002 academic year at the end of the last quarter. Questions on the self-administered, confidential survey considered three general areas: (1) perceived overall clinical learning value of the rotation, (2) specific clinical skills and knowledge gained during the rotation, and (3) clinical professor performance. Only the first two areas will be addressed in this paper. Student responses were grouped according to academic class levels and compared between the third and fourth year classes (Table 1).

Results

A total of 60 students returned the volunteer survey. Almost half (27 students, 49%) of 55 available fourth year students returned their questionnaires. All of the fourth year students had participated in a NHP rotation during the academic year. Over one-third (33 students, 37%) of approximately 90 third year students who attended nursing home rotations during the academic year returned their questionnaires. Cronback's Alpha Reliability Coefficient was .94 for fourth year students' answers and .79 for third year students' answers.

Students reported they thought their nursing home rotation had overall clinical learning value: Fourth year (85.2%) and third year (87.5%) students largely agreed or strongly agreed that their nursing home rotation was a worthwhile learning experience (Question 1). Almost all of the fourth year (96.3%) students thought they had increased their awareness of how additional health issues may affect management of their patient's vision/eye needs, while 84.8% of third year students thought the same (Question 2). Fourth year (88.5%) and third year (87.9%) students almost equally expressed having discovered alternative diagnostic procedures to assess vision/eye conditions (Question 3). Approximately three-fourths (77.6%) of fourth year and third year (75.7%) students increased their awareness of clinical practice opportunities (Question 4).

Students reported they gained specific clinical skills and knowledge during their nursing home rotation:

Table 1: Survey Results

Question	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1 Fourth Year	6 (22.2%)	17 (63%)	2 (7.4%)	2 (7.4%)	0
Third Year	5 (15.2%)	24 (72.7%)	3 (9.1%)	1 (3%)	0
2 Fourth Year	9 (33.3%)	17 (63%)	1 (3.7%)	0	0
Third Year	11 (33.3%)	17 (51.5%)	5 (15.2%)	0	0
3 Fourth Year	8 (29.6%)	16 (59.3%)	3 (11.1%)	0	0
Third Year	12 (36.4%)	17 (51.5%)	3 (9.1%)	1 (3%)	0
4 Fourth Year	7 (25%)	14 (51.9%)	4 (14.8%)	2 (7.4%)	0
Third Year	7 (21.2%)	18 (54.5%)	6 (18.2%)	1 (3%)	1 (3%)
5 Fourth Year	8 (29.6%)	13 (48.1%)	4 (14.8%)	2 (7.45%)	0
Third Year	4 (12.1%)	22 (66.7%)	3 (9.1%)	4 (12.1%)	0
6 Fourth Year	3 (11.1%)	17 (63%)	4 (14.8%)	3 (11.1%)	0
Third Year	1 (3%)	14 (42.4%)	7 (21.2%)	11 (33.3%)	0
7 Fourth Year	5 (18.55%)	5 (15.2%)	5 (18.55%)	6 (22.2%)	0
Third Year	11 (40.7%)	4 (12.1%)	8 (24.2%)	15 (45.5%)	1 (3%)
8 Fourth Year	9 (33.3%)	12 (44.4%)	4 (14.8%)	2 (7.4%)	0
Third Year	5 (15.2%)	7 (21.2%)	10 (30.3%)	10 (30.3%)	1 (3%)
9 Fourth Year	5 (18.5%)	11 (40.7%)	6 (22.2%)	5 (18.5%)	0
Third Year	2 (6.1%)	7 (21.2%)	14 (42.4%)	8 (24.2%)	2 (6.1%)
10 Fourth Year	12 (44.4%)	13 (48.1%)	1 (3.7%)	0	1 (3.7%)
Third Year	22 (66.7%)	11 (33.3%)	0	0	0
11 Fourth Year	7 (25.9%)	13 (48.1%)	6 (22.2%)	1 (3.7%)	0
Third Year	11 (33.3%)	19 (57.6%	3 (9.1%)	0	0

Clinical fact finding skills were enhanced by 77.7% of fourth year and 78.8% of third year students (Question, 5). Clinical recording skills improved from experiences related to their rotation by 74.1% of fourth year and 45.4% of third year students (Question 6). Greater insight into how to interact with other health care providers was gained by 59.2% of fourth year and 27.3% of third year students (Question 7). During the year over three-fourths (77.7%) of fourth year students learned how to write physicians' orders in medical charts to initiate treatment, while over a third (36.4%) of third year students learned how to write them (Question 8). About three-fifths (59.2%) of fourth year and over a quarter (27.3%) of third year students gained a sense of ownership for patient care during their nursing home rotation (Question 9). Almost three-fourths (74%) of fourth year students found it beneficial to work with another student-clinician as a team at a nursing home, while almost all (90.9%) of the third year students found it beneficial (Question 10). About three-fourths (74%) of fourth year students and almost all (90.9%) third year students agreed or strongly agreed that the nursing home residents they served benefited from their services (Question 11).

Discussion

Traditionally optometric clinical training has centered primarily at on-campus clinics. Recently there has been a shift toward including student clinical training at other settings: Veterans Administration Hospitals, military hospitals, optometric and ophthalmologic practices, community health care centers, and other locations. With the aging of the population of the United States, nursing home rotations may be an excellent source of clinical experience for optometry students as they learn how to manage the vision conditions of elderly patients with chronic health conditions.

This study demonstrates that optometry students perceived nursing home rotations as a valuable clinical learning experience. The fourth and third year students in this study reported that their nursing home rotation was worthwhile, and that they gained clinical skills and knowledge.

Part of the differences reported in perceived educational benefits between the fourth and third year students may be attributed to working in teams with two different class levels and different team-member responsibilities. As team leaders, fourth year students generally did most of the patient charting, including recording information, writing physician orders, and writing consultation or referral forms. Therefore, third year students did not indicate they learned charting skills or how to interact with other health care professionals as much as fourth year students reported (Questions 5, 6,7, and 8). However, both groups strongly supported working with another student as a team (Question 10).

O'Toole and colleagues[1] state that attitudes about future plans to work with a specific patient population are influenced and solidified by students' professional educational experiences. Reichert and Dibner[2] found value in exposing medical residents to patients in nontraditional clinical settings, including nursing homes, during a clinical rotation. Flaherty and colleagues[3] were able to demonstrate a change in medical students attitudes by providing them with clinical experiences.

Results from this study may serve as an indicator demonstrating the value of expanding nursing home clinical training programs in optometry schools nationwide. Further research is needed relating to optometric clinical training in nontraditional settings and optometry students' attitudes toward serving the elderly, nursing home residents, and other patient populations.

References

1. O'Toole TP, Gibbon J, Harvey J, Switzer G. Students' attitudes toward indigent patients. Acad Med 2002; 77:586.
2. Reichert SF, Dibner RJ. Exploring community resources in an internal medicine residency. Acad Med 2000; 75:544.
3. Flaherty JH, Fabacher DA, Miller R, Fox A, Boal J. The determinants of attitudinal change among medical students participating in home care training. Acad Med 2002; 77:336-43.

Appendix —Nursing Home Intern Clinical Questionnaire

Answer the following questions concerning your nursing home clinical experiences for the 2001-2002 academic year using the following Likert scale: 1 = Strongly Agree; 2 = Agree; 3 = No Opinion; 4 = Disagree; 5 = Strongly Disagree.

1. I found my nursing home clinical rotation to be a worthwhile learning experience.
2. My nursing home clinical experience increased my awareness of how additional health issues may affect management of vision/eye needs. (Examples include cognitive dysfunction, mobility problems, etc.)
3. I discovered new ways to assess vision/eye conditions during this rotation.
4. My awareness of clinical practice opportunities (nursing homes, geriatrics, special populations, etc.) increased from participating in this rotation.
5. I increased my clinical fact-finding skills during my nursing home rotation. (Examples include finding information in medical charts, information from other health care professionals, etc.)
6. My clinical recording skills (writing in medical charts, filling out reports, etc.) improved from experiences related to this rotation.
7. I gained a greater insight into how to interact with other health care providers (primary care physicians, nurses, therapists, etc.) in an institutional setting from engagement in this rotation.
8. I learned how to write physicians' orders in patients' charts to initiate treatment.
9. I gained a sense of ownership for patient care during this rotation.
10. I found it beneficial to work with another student-clinician during this rotation.
11. I feel that the residents we serve at the nursing homes benefit from my/our services.

Scientific Poster Format
(Continued from page 128)

poster underscores the significance of effective and professional oral communication skills. Good communication skills, both oral and written, are not only necessary to be a successful student but also to be an effective optometrist.[8] Another key ability that is evaluated and reinforced by this educational paradigm is the development of acute research skills. This exercise helps students to be able to identify weaknesses in their knowledge base and to seek out the appropriate resources to answer their questions and to keep up with the latest developments in the literature. This helps to build a foundation for a future of life-long learning and problem-solving skills.[9-10]

Aside from the fact that using a scientific poster presentation as an educational tool helps students strengthen their communication and research skills, it also introduces them to an educational format that they will experience in the future, likely in a continuing education setting. It definitely increases the comfort level of students in presenting a poster at a scientific meeting, as was our first hypothesis that was proven by our survey results. Our second hypothesis, that this educational paradigm will likely increase participation in poster presentations at future scientific meetings, was neither proven or not proven by our survey results. We hope that this educational experience will provide the initial familiarity and interest in the poster format to motivate these future optometrists to directly participate in scientific meetings. We will not truly know for several years how much of an impact, if any, this educational tool has had as far as future participation is concerned. Even though this second hypothesis cannot be fully evaluated at this time, we feel that incorporating the poster presentation format into the optometry curriculum, as well as into any other medically based professional curriculum, is definitely a valuable and beneficial addition to the program.

Conclusion

This new educational paradigm that incorporates a poster presentation into the third year Clinical Medicine laboratory curriculum at the Pennsylvania College of Optometry was a successful instructional and educational experience from both a faculty and student standpoint. The benefits to the Clinical Medicine laboratory program were demonstrated through survey results that demonstrated students learned the format to develop a poster and increased their comfort level in producing a poster at a scientific meeting.

References

1. Johns M, Planning and producing scientific posters. Journal of Audiovisual Media in Medicine, Vol. 21, No. 1/1998, 13-17.
2. Pagani JM, To provide a problem-based learning approach in the clinical medicine laboratory that utilizes hands-on experience." Lecture. American Academy of Optometry, San Diego, California, December 1994.
3. Cuddy P, OKI J, Wooten J. Online peer evaluation in basic pharmacology. Academic Medicine, Vol. 76, No. 5/ May 2001, 532-533.
4. http://ublib.buffalo.edu/libraries/projects
5. http://www4.ncsu.edu/~grhess/papers/posterpaper
6. Sisak, ME. Poster sessions as a learning technique J. Chem. Educ. 1997 74.
7. Moule P, Judd M, and Girot E. The poster presentation: what value to the teaching and assessment of research in pre- and post-registration nursing courses? Nurse Educ Today 1998 Apr;18(3):237-42.
8. Laidlaw T, et al. Implementing a communications skills programme. In Medical School: Needs Assessment and Programme Change. Medical Education 2002; 36: 115-124.
9. Drake R. Anatomy education in a changing medical curriculum. Acta Anat Nippon Vol. 74, No. 4, August 1999, 487-49.
10. Rimkus J, Siemsen D. How to write case-based laboratories. Optometric Education. Volume 24, Number 2/ Winter 1999, 52-55.

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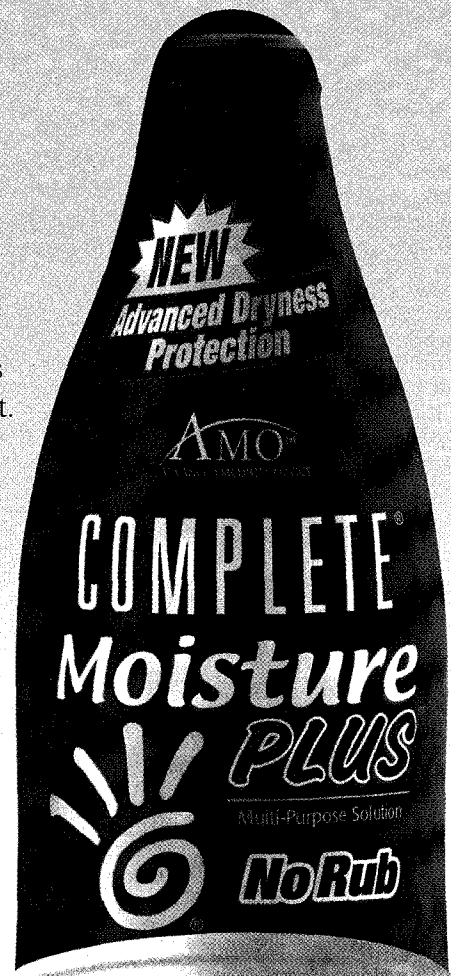

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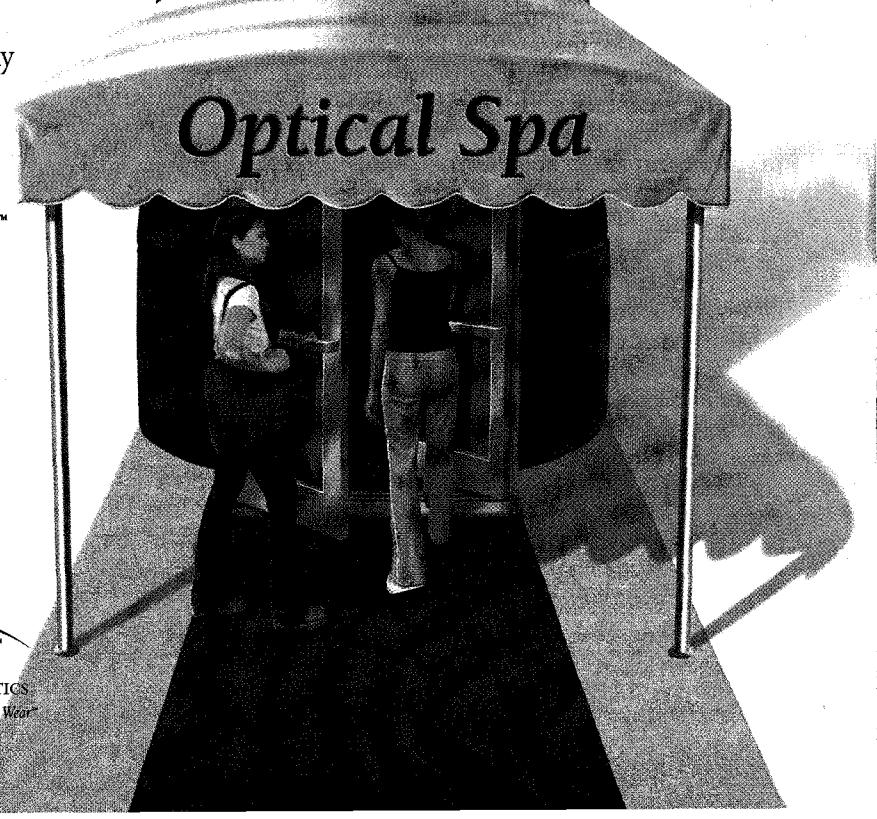

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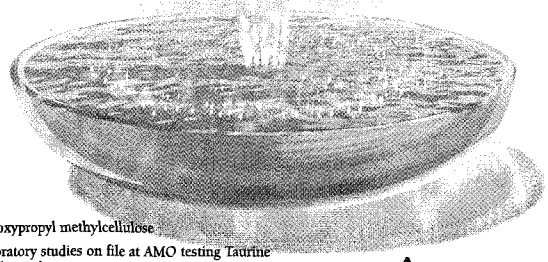

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