

Clinical Training Opportunities in The Third World



Association of Schools and Colleges of Optometry

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

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CONTENTS

WINTER 1998

The Journal of the Association of Schools and Colleges of Optometry

ARTICLES

An Evaluation of U.S. Optometry School Curricula

Heidi M. Bamberg, O.D. Elizabeth M. Grenier, O.D. Michael G. Harris, O.D., J.D., M.S. A study of the curricula of the U.S. optometry schools and a comparison of the data to a similar study conducted five years ago facilitates curriculum restructuring decisions.

41

COMMUNICATIONS

Helping the Needy and Enhancing Clinical Training in the Third World

Douglas G. Horner, O.D., Ph.D. Kathryn J. Lueck, B.S. Dierdre A. Reid, B.S.

The clinical training and services resulting from activity in Mexico by the Indiana University Volunteer Optometric Services to Humanity (VOSH) student organization is reported.

48

Assessing Outcomes in Optometric Education

Council on Optometric Education COE provides this commentary so that optometric educators and administrators will understand what outcomes are, their importance, and how they relate to the quality of optometric education.

54

Tenure for Clinical Faculty

Roger Wilson, O.D.

The author discusses the nature of tenure for clinical educators and describes the rights and responsibilities of clinical faculty, administrators and the institution in enabling faculty to attain tenure.

57

DEPARTMENTS

Editorial: Curricular Change in Optometric Education — Maintaining the Balance Felix M. Barker, II, O.D., M.S.

Letters to the Editor 38

Industry News 39

ASCO Calendar 40

Resources 62

Cover photos: Cover photos: Histories and complaints are taken by Indiana University VOSH students as other patients wait for services in Guanajuato, Mexico. A VOSH student performs retinoscopy.



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EDITORIAL

Curricular Change in Optometric Education-Maintaining the Balance

his issue of *Optometric Education* contains an important educational research paper by Bamberg, Grenier and Harris which presents a critical analysis of the curricula of our schools and colleges. The authors are to be complemented on the quality of their paper and the resource value this work will bring to our collective thought processes regarding the preparation of entry level practitioners of optometry. Although this paper is empirical in its approach, the authors also provide the reader with a philosophical discussion of the educational dilemmas facing our faculties in the area of curriculum design and implementation

In considering the issues raised by this paper it is important to point out that there has been a substantial amount of prospective curricular analysis taking place within our profession as evidenced by the ASCO curriculum model, the NBEO, the Georgetown Conference and, most recently, by the ASCO Task Force on Curriculum\Entry Level Optometry which is planning a spring 1998 meeting of the academic officers.

My own view of the curriculum debate is that, rather than a static statement of academic content, the modern curriculum is more a plan and method of managing the transfer of information and skills to our future colleagues. Said transfer, to be optimally effective, must include the critical skill of maintaining the educational function beyond the point of graduation, which is a difficult requirement to achieve by any estimation.

The content issues, although easier to debate, are still difficult to solve because they usually bring out the true territorial nature within each of us. And the apparent need for content review has been fueled by the changes taking place within our practice areas, creating the need for adding more and more course work in disease managementrelated areas of study. Unfortunately, this situation has often created a revisionist vs. traditionalist struggle over which topical area will command how much of the time available within the curriculum. While some adjustment may be both necessary and appropriate, I would submit that the greater question to ask is how might we add new concepts while still effectively embracing the greater whole of content which has and will continue to define our profession.

We do need to think this through, not only because of our traditional "turf wars," but

because even if our scope of practice related content were static, the scientific knowledge base, the technological capability, the health care policy and the educational paradigms we will continually confront are sure to change sufficiently to cause significant discomfiture to an overtly stable academic program. In order to remain effective then, we must learn to manage change, the same skill we expect of our students after leaving our tutelage.

Optometry is no different from its sister professions of medicine, podiatry and dentistry in the need to cope with an expanding knowledge base, technology and other changes. Rather than "giving up" areas of knowledge and practice, it has become necessary for each profession, including optometry, to embrace ever broader areas of knowledge, delivered by increasingly complex technologies, to the benefit of the public we serve. To do so usually requires the use of creative approaches to learning such as the development of critical thinking skills in our students. This approach will not only improve their current education but will also advance our often quoted goal of producing "life-long learners.

It should also be of concern to each of us that managed care seems to have increasingly significant impact on our educational curricula. Not only does the impaneling of providers often upset the access to our traditional patient base, but the additional pressure produced by mandating a direct care role for academic preceptors is also specifically contrary to the educational goals and objectives of producing an entry level practitioner at graduation. Unless this is sorted out quickly we could see a significant "roll back" in the now two decades of progress we have made in optometric clinical education.

In light of the increasing crowding we are seeing in our didactic programs and the potential impact of managed care upon clinical education, the future role of residency training will be of undoubtedly increasing importance. Residencies do help us build a strong educational base by providing manpower assistance in the precepting role alongside clinical faculty and by the outstanding and intensive postgraduate clinical experience they provide postdoctoral residents themselves.

Other professions — including podiatry, dentistry and medicine — have had to rely heavily upon postgraduate education programs in order to meet the requirements of entry level practice. While we are far from

this point in optometry, the push-pull effects of over crowded curricula and the desire for a higher entry level of practice may prove to be an accelerant of residency program development. Certainly, there is significant current interest within optometry to both strengthen and expand optometric residency training. In this regard, we look forward to the discussion at the March 20-22, 1998 ASCO Critical Issues Seminar on Residency Education. But as we focus on residency programs, we need to remain vigilant against the potential for trivializing of our undergraduate educational programs.

Finally, while it is considered to represent a step forward, we ought to have some concerns about how outcomes based evaluations (OBE) may be used in our curriculum development. These newer methods of planning make a lot of sense because they are designed to look at certain endpoint success criteria that are often related to the ability to practice or to be employed in practice. While this assessment method can help us to identify more effective resources and teaching strategies, there is at least some danger that by looking at the shorter term outcomes of practice viability we could justify an artificial and potentially harmful reduction in critical basic educational resources and content. It is essential that any OBE assessment program that is used measure outcomes throughout the practice life of the graduate in order to acquire and maintain longer term learning skills sufficient to remain viable in the current and future practice environments that will no doubt continue to manifest a rapid pattern of technological, scientific and policy making

As with everything in life, the optometric curriculum that will remain viable is one which can maintain balance in its approach. A proper balance in content areas will ensure that our scope of practice grows logically, while ensuring that we retain our traditional positions of strength. Continual re-evaluation of our methods of educational support of our students will ensure we are mentoring them in the most appropriate fashion for the future and with an eye to their own development as life-long learners.

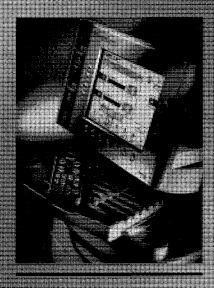
Felix M. Barker, II, O.D., M.S., F.A.A.O. Editor

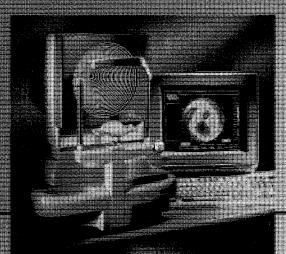


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Letters to the Editor

The spring 1997 issue of Optometric Education featured optometric residency education. As described in the lead paper, current residency programs, while valuable to both the residents themselves and the profession, can, at most, accommodate only approximately 10% of graduating ODs. Alternative similar programs located outside of the traditional structures discussed in this issue of Optometric Education should therefore be considered.

The Jules Stein Eye Institute and Department of Ophthalmology at the UCLA School of Medicine in Los Angeles, California, began offering one such program in the fall of 1993: a one-year fellowship (for either postgraduate optometrists or ophthalmologists) in advanced contact lens practice in the Contact Lens Service, under the auspices of the Department's Cornea-External Ocular Disease Division. "Fellowship" was used instead of "Residency" because residencies in ophthalmology are usually 3-5 years in length and primarily offer clinical training without much research expectation, whereas fellowships are 1-2 year programs at a more advanced clinical level in subspecialty training and research is expected. The latter description appeared more appropriate to this particular program. The purposes of the JSEI Fellowship in Contact Lens Practice were to provide state-of-the-art clinical training in contact lens care, and to encourage scientific investigation in contact lens application, anterior ocular disease and physiology and related topics. Partial funding was solicited and awarded from Vistakon, a Johnson & Johnson company.

Three Fellows have thus far completed this program. All three report that their clinical and educational experiences were very positive. Two former Fellows achieved part-time academic appointments. In terms of contributions to our profession and to human knowledge, we note that four peerreviewed research publications and two additional text chapters have

thus far been published or are in press authored by these Fellows, and several studies and manuscripts are currently in preparation.

We hope that providing a brief overview of this particular program will encourage optometric students to consider seeking advanced clinical and academic training in both traditional and perhaps non-traditional venues.

Sincerely yours,

Farid Eghbali, O.D. Clinical Instructor, SCCO Clinical Instructor of Ophthalmology, JSEI, UCLA School of Medicine

Tony T. Chahine, O.D. Clinical Instructor, UCBSO

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Professor of Ophthalmology,
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Editor, Optometric Education

The Association of Schools and Colleges of Optometry invites applications for the position of editor of its quarterly, peer review journal, *Optometric Education*. The editor is responsible for the editorial content of ASCO's journal, including four editorials per year. The editor appoints the journal review board and works with the managing editor in facilitating a smooth peer review process.

The editor should have a background that includes educational publication experience. Strong writing skills and a demonstrated interest and involvement in optometric educational issues are desirable. Experience with ASCO's journal, *Optometric Education* — either as a writer or as a review board member — is recommended.

The editor serves for a three-year term, renewable at the discretion of ASCO's Board. The new editor's term will begin July 1, 1999. The editor will serve as associate editor during a one-year transition from July 1, 1998 - June 30, 1999. The position is unpaid. For further information, contact Patricia C. O'Rourke, managing editor, at (301) 231-5944.

Interested candidates should send curriculum vitae and writing samples by February 1, 1998 to:

Managing Editor Association of Schools and Colleges of Optometry 6110 Executive Blvd., Suite 510 Rockville, MD 20852

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OPHTHALMIC

INDUSTRY NEWS

Three Companies Join ASCO as Sustaining Members

Three companies joined ASCO as Sustaining Members, effective January 1, 1998. They are: EagleVision, Inc.; Jobson Publishing Corp.; and Safilo Group. EagleVision, a medical device manufacturer based in Memphis, Tennessee, focuses on the diagnosis and management of Dry Eye Syndrome. Jobson Publishing Corporation publishes 20/20 Magazine, Vision Monday and Optometry Today. It also sponsors the annual EyeQuest Conference. Safilo Group is a global eyewear company and manufacturer of ophthalmic and fashion sunglass markets. The companies were approved for membership by ASCO's Board of Directors. For more information on ASCO's Sustaining Member Program, contact Patricia C. O'Rourke, director, public and member affairs (301) 231-5944 or porourke@opted.org.

CIBA Offers Practitioners Help on Internet

CIBA Vision Corporation's "The Business of Eye CareTM" seminar series has helped sharpen practitioners' business skills since its inception in 1992. CIBA Vision has recently made these valuable tools available to practitioners on the internet. This new format makes developing the business side of the practice simple, by providing a wealth of information, advice, and planning tools all in easy-to-use interactive programs on CIBA Vision's website (www.cibavision.com/Prosight/Business_Center).

"CIBA intended 'The Business of eye Care™' seminars to provide new management strategies and new paths of action for today's eye care professional," said Warren Modlin, Dip. Optom., manager of professional support, North American Optics. "The Business of Eye Care™ online is a self-study tool designed to guide practitioners through the evaluation and planning process of their prac-

tices. The second module, 'Leading Your Practice for Results™,' helps practitioners evaluate their staff and gives them the tools to manage it for success."

Roughly 1,600 practitioners have attended the seminars around the United States since 1992. The online version allows practitioners to seek advice from CIBA in building the contact lens section of their plan. It also provides case study examples from typical practices to help practitioners develop their own practice strategies and plans. Information from practitioners' online sessions can be saved on the web with password protection to allow for further development of their plans at future visits.

Practitioners can sign up for a free account by accessing CIBA Vision's website. The programs can be found in the Business Center of the ProsightTM link.

Wesley Jessen Reports Patients Unaware of Colored Toric Lenses

Six of ten soft toric lens wearers are uncertain if lenses are available in their prescription that would enable them to change or enhance their eye color, according to a recent survey conducted by Wesley Jessen.

The survey of 87 soft toric wearers also showed that the number of astigmatic patients who have ever tried or worn colored lenses is a third lower than for spherical patients.

Early in 1997 Wesley Jessen expanded its line of colored torics to include fifteen made-to-order opaque and enhancer colors. It is the only company to offer a full range of colors in virtually any toric prescription.

"Practitioners have a great opportunity to delight their patients and enhance their bottom line by offering the option of color to their astigmatic patients," said Dwight H. Akerman, O.D., F.A.A.O., Wesley Jessen's director of professional services.

Wesley Jessen Announces Patient Home Delivery Service

Wesley Jessen has begun accepting telephone orders from practitioners for patient home delivery of both its disposable and conventional contact lenses.

Practitioner orders of four or more boxes of disposable lenses are shipped free-of-charge to the patient's access.

Marchon Targets Feminine Market With Choices in Superthin 7

Catherine Soroko, Marchon's corporate communications director, reports that Marchon is targeting the feminine market with an extraordinary color statement of 19 choices for one style. "For the past five to seven years," she said," the unisex movement has dominated the optical industry featuring small, clean modern eyeshapes that appeal to millions of men and women throughout the world available in four or five basic colorations. However, upon examining the eyewear and in particular the colorations, it's apparent that colorations such as matte black, tortoise, antique gold, and antique silver are more masculine than feminine and contain a very dark base color."

After extensive research and development, Marchon announces that Superthin 7, a modern, small eyeshape, is now available in an unprecendented total of 19 colorations, an aggressive move that addresses women who want a modern frame in a flattering, feminine coloration.

The base color of Superthin 7 is rose skin toned which allows the frame color to become part of the face. The color options provide the wearer with the unique opportunity of selecting eyewear that is as individual and distinctive as they are. The temples are hand made with acetate sheeting with rich dynamic colorations that match the front of the frames.

ASCO Meeting Calendar - '98

January 1998

17th — COE/ASCO Task Force on Fellowships Meeting (Corpus Christi, Texas)

March 1998

19th — Executive Committee Meeting (Houston, Texas)

20th —Board of Directors (Flouston, Texas)

20th-22nd — Critical Issues Seminar on Residency Education (Houston, Texas)

June 1998

23 — Executive Committee (a.m.) (Orlando, Florida)

23-24 — Annual Meeting (Orlando, Florida).

24 — Annual Luncheon (Orlando, Florida)

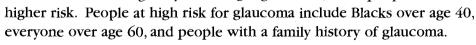
26 — Sustaining Members Advisory Committee Breakfast (Orlando, Florida)

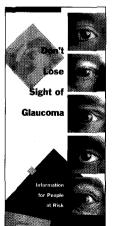
For the most up-to-date information on ASCO meetings, contact ASCO's website at http://www.opted.org

Glaucoma Awareness Month January 1998

Increase awareness about glaucoma and help reduce severe vision loss and blindness.

Millions of Americans are at risk of losing their eyesight to glaucoma, a leading cause of blindness in the United States. Although anyone can get glaucoma, some people are at





Please join the National Eye Health Education Program in a nationwide effort to increase awareness about glaucoma and the importance of receiving a dilated eye exam at least every two years for people at high risk for glaucoma.

To receive a FREE Glaucoma Awareness Month Kit, call toll-free 1-800-869-2020.





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

An Evaluation of U.S. Optometry School Curricula

Heidi M. Bamberg, O.D. Elizabeth M.Grenier, O.D. Michael G. Harris, O.D., J.D., M.S.

As the equality of the same continues to expend to the boundaries so forth by legislation, trolomogyand the Ote same opions agreemently schools smart erisseere ikkat drum geneliseites aas kremitsgoon aarth ikk elongue. Curriculus eroteurs un made te hicupa rate the owner-court constitution the community has important. This study compared the carrie use of the U.S. optimetry ethnik in an affort to facilitate metrachiene decesame. Plata útile token jam coveres cartalogs for Mic 1990-1996 marketine, year and tablebred by clin's hitters and propertion of the carrecoller denoted to the correction fracts of Adec Himtorical Science (Berton) Science, Union Science, Primary Care. Practice Management, Vision Eserapy, Contact Causes, Ocular Ossessi. Warring chapy, and Lore Vision and Greenfoligy. The data were attraced and compared to a simpler shady conducted the years upo to show any charge. i desperanta i perioda da caracar di con illa di perioda di con proportion of the controlling was found in the Weige a Trendrija desa dikira dikante yanda Saatsa a trocksa di bere Aus also decora significant enfaction en interesignified No the hand, sommers over the best four years while hours denien in Audo Dries, inc. swistampilo Ministeria Cintical identificat Andre Antre District Anne times es ista la iscidicación calabatem Augis sono dia dia base parti

Our fredings indicate that U.S. optenioring wheals place curricular couplines in different arms. The course changes made over the last five years have largely consolidated his hours detailed to base scanness with superfect leaves, pharmacologic, and oction disease. These changes seem to be in response to the expanding responsibilities of the profession. By earning the infrastructure of the correculum coloculors can make the first particular decision of the correculum coloculors can make the first particular decisions about how the curriculum should change in negative to changes in the optometric profession.

KEY WORDS: curriculum, didnetic, climati, education, scope of position, backs

Introduction

ver the last 20 years, the optometry profession has undergone significant change as a result of legislation and the expanding scope of practice. Americans are turning to optometry as a primary health care profession. Our society is making new demands on optometry by expanding its community health professional duties and leadership roles in hospitals and health care facilities.1 As a result, optometrists must be fully qualified to respond to patients as knowledgeable, responsible primary health care practitioners. Preparation for this responsibility begins at the educational level, where an expansion in the optometric curriculum is necessary.2

Dr. Bamberg is a 1996 graduate of UCB. She completed a primary care residency at UCB and is currently in private practice.

Dr. Grenier is a 1996 graduate of UCB. She completed a residency in low vision rehabilitation and is currently in private practice.

Dr. Harris is associate dean, clinical professor and chief of the Contact Lens Clinic at the University of California - Berkeley (UCB) School of Optometry. Optometric institutions are challenged with providing an expanded scope of courses to adequately prepare new graduates to successfully compete in the health care system.

In the past, vision science has dominated the optometric education curriculum. However, biological science information has more than doubled in the past 15 years and some practitioners claim its importance has surpassed that of physiological optics.3,4 response to this trend, schools have significantly restructured basic science courses including the biological sciences, vision science, and optics by adding course material, adding prerequisite requirements, and reorganizing course content. Basic science knowledge has been emphasized as well as skills in data analysis, critically reviewing scientific findings, and thinking scientifically.⁵ As the profession changes from "recognize-and-refer" to "diagnose-treat-manage," educators must expand their emphasis to develop these skills.6 With the addition of therapeutic drug laws, course expansion in ocular disease, diagnosis, treatment and management, including ocular manifestations of systemic disease, is mandatory. Currently, therapeutic legislation is widely in effect with only three states remaining without legislation.7 (Editor's Note: As of August 1, 1997, all states have passed legislation that authorizes optometrists to use and prescribe drugs in the treatment and/or management of eye disease and in 39 of these, optometrists can treat glaucoma.)

However, critics say these changes toward a medical model sacrifice the areas of traditional optometric disciplines.⁸ To avoid these consequences, changes should be made to expand the scope without compromising necessary course content.⁸

Expanding the scope of practice means expanding the curriculum which is already bulging at the seams. Educators are constantly reminding us of the importance of current course offerings while expressing the need for additional courses in new areas. The aging population suggests the importance of gerontology and low vision education.9 Binocular vision is also becoming more important as workplace technology continues to increase visual demands.¹⁰ In order to professional current on advances, courses are needed in automated technology, laser procedures,

and computer use for educational and business purposes. 13,12

Courses on interpersonal communication and special populations can improve patient care skills.³ Practice management is an area that has undergone significant curriculum revision, but the changes have not kept pace with the major changes in health care.¹³ An expanded knowledge of professional ethics and business skills including efficient use of staff and the practical use of computers to enhance a practice can significantly improve the quality of care.^{12,14,15}

The present four-year educational structure restricts the inclusion of all of this coursework without deemphasizing or misrepresenting the important areas of daily optometric practice. Already curriculum expansion has come at some expense to areas such as the vision sciences, optics, and public health.6 Current compromised levels of training in contact lenses, gerontology, practice management, and vision therapy have raised concern among educa $tors.^{9,13,16-18}$ Recent graduates have admitted feeling unprepared for optometric practice. 19 Most reported their practice management education did not convey realistic expectations of life after optometry school.19

Some schools have survived the crunch by listing many basic science courses as prerequisites for admission, but the lack of uniformity and clinical relevance in these undergraduate courses has been problematic. 20,21 As modifications are made, the schools form independent decisions about the importance of various courses. The result is a myriad of curricular courses which varies greatly among the institutions, thus potentially compromising professional uniformity. A detailed and strategic plan must restructure the optometric education to ensure that the necessary basic educational foundations of a core curriculum are in place.22

The methods proposed for handling these curriculum problems are (1) restructuring the current coursework; (2) reducing courses; or (3) increasing time of education.¹² These issues were addressed at the national meeting sponsored by the Association of Schools and Colleges of Optometry (ASCO) and the American Optometric Association (AOA) in July 1992. The result was a recommended curriculum model for entry level practice that uses an out-

comes-based education (OBE) approach and emphasizes alternate teaching strategies.⁵ The creation of this curriculum model encouraged educators to examine their present curriculum.

As a result, significant restructuring has already taken place at many institutions. Perhaps further restructuring could be better focused after considering a comprehensive comparison of curricula. Our study assessed the shape of the current curricula, the changes being implemented and how the schools compared with respect to emphasis in specific areas. Evaluating areas of educational emphasis may help design curriculum revisions which broaden the scope of education without compromising quality.

Methods

Collecting the data

A letter was sent to each of the 16 optometry schools in the United States requesting a copy of the current 1995-1996 course catalog (See Appendix 1 for abbreviations of optometry schools.). In instances where the actual hours devoted to lectures and laboratories were not listed in the catalogs, an additional request for that specific information was made.

Compiling the data

The curricula of the schools were compared by assigning each course to one of eleven topic tracks and comparing clock hours devoted to each track. Information was collected based on the course descriptions and number of hours designated in the course catalogs and curriculum summary sheets. The track headings were identical to those used in the 1991-1992 study to allow for easy comparison of the results²³ (See Appendix 2 for abbreviations of the topic tracks.). The predetermined tracks were assigned as follows:

1. Basic Biomedical Science: anatomy and physiology, biochemistry, histology, microbiology, immunology, pathology

2. Visual Science: visual optics, monocular sensory processing, ocular motility, binocular vision and space perception, vision development, psychophysics, neurophysiology of vision, color vision and photometry, infant vision

- 3. Optical Science: geometrical optics, ophthalmic optics, mechanical optics
- 4. Pharmacology: general and ocular.
- 5. Primary Care (pre-clinic): preclinical skills, patient communications, and pediatric optometry
- 6. Practice Management
- 7. Vision Therapy: visual efficiency, vision perception and learning, strabismus and amblyopia, binocular vision, vision rehabilitation.
- 8. Contact Lenses
- Ocular Disease: ocular and sytemic disease, general pathology and medicine, medical lab procedures
- 10. Low Vision and Gerontology
- 11.Other: research design and methods, public health, epidemiology, electives (i.e., environmental optometry, sports vision)
- 12. Clinical Education: all specialty departments combined, i.e., Family Practice, Contact Lenses, Vision Therapy, Pediatrics, Ocular Disease, and Low Vision

The number of clock hours devoted to each course and lab was determined by first standardizing the hours designated in the course catalogs to eliminate the difference between the semester and quarter system. For the semester system, the number of hours was multiplied by fifteen weeks. For the quarter system, the number of hours was multiplied by ten weeks. For summer sessions, the number of hours was multiplied by six weeks unless otherwise specified. These hours were summed for each track for individual schools, then tabulated to determine a total number of hours devoted to didactic training for each school.

The total number of clinical education hours was determined from information in the course catalogs including the number of clinical extern rotations and number of weeks for each rotation. Our study did not break down clinical exposure into specialty areas such as contact lenses, vision therapy, low vision, and primary care. The hours presented as clinical education represent the total time spent in any clinic with patient encounters. To provide summary information for each optometry school, the mean percentage and standard deviation of clock hours assigned to each track was calculated.

Data Analysis

The percentage of the hours spent in each track was calculated by dividing the total number of clock hours in a track by the total number of hours spent in all the tracks and multiplying by 100. Comparing these numbers, each school was then assigned a final ranking for each track based on the total number of clock hours and proportion of the curriculum represented by each track. These rankings are not intended to imply that some schools provide better education than others. Rather, they should serve as a tool to identify areas of curricular emphasis.

To investigate any change in curricular emphasis over the last 5 years, we compared our results to those found in the 1991-1992 study.²³ Values representing the mean number of clock hours devoted to each curricular track and the mean proportion of the curriculum were assembled for comparison.

Results

The curriculum of the 16 U.S. optometry schools for the 1995-1996 academic year was analyzed and the total number of clock hours assigned to each curricular track was tallied. (Table 1) The total number of hours dedicated to the didactic curriculum ranges from a low of 1,725 to a high of 2,679. The mean value of 2187 hours represents 53.7% of the total curriculum devoted to didactic education. The total number of hours dedicated to clinical experience ranges from a low of 1215 to a high of 2,240. A mean value of 1910 hours represents 46.3% of the total curriculum devoted to clinical education.

Clock hours varied by two to 4.9fold for both basic science and specialty curricular tracks. There was a two-fold difference within the Contact Lens didactic curriculum (85 clock hours compared with 160 clock hours). This represents the least variability found among all the tracks. The greatest variability among the specialty tracks was in the Vision Therapy track where there was a 3.7fold difference (60 clock hours compared with 220 clock hours). greatest variability among the basic science tracks was in Basic Biomedical Science where there was a five-fold difference (109.5 clock hours compared with 538 clock hours).

The proportion of the curriculum represented in each track was also tallied. (Table 2) The highest percentage

of its curriculum any school devoted to clinical education was 54.6%. Some schools devoted equal time to didactic and clinical education. Two schools devoted the highest proportion to didactic education (over 63%), leaving less than 37% of the curriculum for clinical education.

Schools were ranked according to the hours devoted to each curricular track and the proportion of the curriculum represented. (Tables 3 and 4) The school that ranked number one in Basic Biomedical Science and Ocular Disease tracks also ranked almost last in the Optical Science and Low Vision tracks. Similarly, the number one rank in Optical Science, Contact Lens, and Low Vision ranked last in Vision Therapy and Practice Management and devoted much less time to Clinical Education. The school that ranked the highest in percentage of clock hours devoted to Clinical Education, ranked the lowest in the Ocular Disease track.

We compared the mean clock hours in each track for the 1995-1996 curriculum to the mean clock hours from the 1991-1992 study.²³ (Figure 1) The mean number of total clock hours in the 1995-1996 curriculum was 200 hours greater than in 1991-1992. The mean total didactic and clinical hours increased by 7 and 197 hours, respectively. Interestingly, the added hours were largely devoted to expanding clinical education.

The greatest change in didactic curriculum emphasis over the last 5 years among all the schools has been in the Basic Biomedical Science and Ocular Disease tracks. The mean reduction in basic biomedical science of 140 clock hours corresponds to an equivalent mean increase of 142 clock hours in ocular disease. The basic science tracks (Basic Biomedical Science, Optical Science, Vision Science) were the only tracks to suffer reduction in number of hours over the last five years. All of the other curriculum tracks showed an increased number of hours.

Discussion

Our results indicate a wide variability among optometry schools in the number and proportion of clock hours assigned to each of the curricular tracks. Similar variability was found in the '91-'92 study.²³ The wide range of total clock hours invites speculation about how the educational

experiences compare among the schools. Perhaps the schools with the fewest total clock hours are not eliminating important material but rather improving the efficiency of their system. They may have shifted some courses into prerequisite requirements or implemented alternative teaching techniques. The schools may rely more heavily on programs that incorporate self-study and the use of computers and videotape. These teaching aids allow information to be taught outside the usual didactic lecture format. By transferring more educational responsibilities to the student, more class time can be devoted to quality discussion and critical thinking.5,13,16

The schools with the most total clock hours have perhaps chosen to add summer sessions and longer days in order to incorporate all of the material they consider necessary. Their curriculum content may be impressive, but does their thoroughness come at the expense of exhausting their students? Must the students at these schools resort to rote memorization instead of taking extra time for quality understanding and analysis of the material being taught? To prepare for future additions to the curriculum, schools will have to improve efficiency and condense some course material.

By comparing rankings within each track, we noted that each school places more emphasis in some areas while deemphasizing others. Specialization is to be expected at schools where the educators themselves are specialists.22 These areas of expertise set the institutions apart. Students with special interests typically wish to be guided by experts in the field. Areas of curricular emphasis allow the advanced teaching necessary for specialization. Without this opportunity, students would be forced to seek specialized training through residency programs. need for additional residency programs would increase dramatically while resources are already deficient in supporting the current programs.²⁴

However, educators who allow their institutional strengths to drive the curriculum may eventually implement changes that sacrifice entry-level competency of the professional.²² Basic and vision science foundations provide the framework for understanding traditional optometry. It is important to maintain this core curriculum on which to build knowledge and skills for life-long learning.²⁵ As advanced skills are required by the profession, the necessary education can be added to the core curriculum at the national level. This consistency will strengthen the skills for entry-level competency while allowing students to take advantage of specialization within the schools.

Over the last five years, the optometry school curriculum has incorporated more than 200 additional hours in the same four-year framework. The didactic curriculum has undergone the most significant restructuring. The basic science curriculum has undergone the largest decrease in total clock hours. Why was basic science selected for these changes? Initially, basic science composed the majority of the optometric curriculum. Thus, it was an area that could be significantly restructured without compromising the already limited courses in other tracks. The information was not necessarily less important than other subjects. Perhaps the shift in our profession from the vision science model to a more medical model decreased the need for basic science knowledge. Many schools now list various basic biomedical science courses as prerequisites. This shifts a portion of that track out of the curriculum and may result in fewer hours of biomedical science offered in the curriculum and a lower overall ranking for that track.

While basic science hours have decreased, hours devoted to ocular disease have increased equally. This shows that optometry schools are not necessarily adding extra hours to their curriculum, but are merely refocusing emphasis on ocular disease courses. These changes at the optometric education level support the advancing role of the optometrist to a primary health care provider. The ocular disease curriculum track encompasses all courses related to diagnosing, treating, and managing ocular disease. With the passing of the therapeutic drug laws, the qualified optometrist must learn not only ocular disease itself, but the ocular manifestations of systemic disease. In addition, one must learn how pharmaceutical agents can affect patients with systemic conditions. In order to accurately diagnose a systemic condition suspected by ocular signs and symptoms, we must understand what laboratory tests to order. This vast amount of newly incorporated information can explain the increase in total number of hours in the ocular disease track over the last five years.

Despite the addition of many courses in the specialty didactic curriculum, most of the hours added over the last five years have been added to clinical education. Current graduates are having more patient encounters and more opportunity to perfect their entry-level clinical skills. By reorganizing the didactic curriculum to shift its emphasis of course content instead of adding hours, clinical education was given some room to expand.

When collecting the data for these schools, every effort was made to be consistent in assigning courses with similar content to the same track. Some classes, however, included material from several tracks. example, many ocular disease courses included related pharmacology material while some basic science courses included background on ocular disease to illustrate the relevancy of the material. Also, courses with identical names did not always have identical course material. In this event, the course was assigned according to the content listed in the course catalog. We paid particular attention to how the courses were assigned in the 1991-1992 study so that we would have a reliable platform on which to compare.23

Compiling the data in a consistent manner was also challenging because the course catalogs did not always accurately reflect the curriculum. For example, UCB offers a vision science series of three courses of five weeks each, over one semester. This detail was not explained in the course catalog and could have been missed by the casual observer. Also, many schools list various basic biomedical science courses as prerequisites. This stipulation shifts a portion of that track out of the curriculum and may result in low numbers and overall ranking for that track.

While each school designs its curriculum to produce highly qualified professionals adequately trained in all aspects of optometric practice, it becomes apparent when comparing total clock hours devoted to various tracks that the schools currently do not offer equivalent instruction in all areas. However, to deduce that the quality of education in the schools varies directly with this relationship is speculation. Nonetheless, equiva-

lent instruction may provide a more uniform educational foundation.

Appendix 1.

School Name Abbreviations

UAB University of Alabama at Birmingham

UCB University of California at Berkeley

FSU Michigan College of Optometry at Ferris State University

UH University of Houston

ICO Illinois College of Optometry

IU Indiana University

UM University of Missouri at St. Louis

NEW New England College of Optometry

NSU Northeastern State University

OSU The Ohio State University
PUC Pacific University College of
Optometry

PCO Pennsylvania College of Optometry

NSE Southeastern University of Health Sciences College of Optometry

SCC Southern California College of Optometry

SCO Southern College of Optometry SNY State University of New York

The Inter American University of Puerto Rico School of Optometry is also a member of the Association of Schools and Colleges of Optometry, but was not included in this study.

Appendix 2.

Curriculum Tracks Abbreviations

BS Basic Biomedical Sciences

OS Optical Science

VS Vision Science

PC Primary Care (pre-clinic) PM Practice Management

VT Vision Therapy

CL Contact Lens
OD Ocular Diseas

OD Ocular Disease P Pharmacology

LV Low Vision and Gerontology

O Other

DE Didactic Education

CE Clinical Education

Table 1
The Total Curriculum Track Clock Hours For Each Optometry School

See Appendix 1 and 2 for school and curriculum track abbreviations

	BS	os	vs	PC	PM	$\mathbf{V}\mathbf{T}$	CL	OD	P	\mathbf{LV}	О	DE	CE	TOTAL
UAB	538	200	200	320	72	150	160	494	95	60	130	2419	1788	4207
UCB	195	300	196	375	60	120	150	360	60	90	150	2056	2133	4189
FSU	210	315	285	225	60	210	135	375	105	60	135	2115	2160	4275
UH	285	315	165	555	90	135	135	330	105	45	135	2295	2160	4455
ICO	450	220	270	270	20	180	100	200	120	60	168	2058	1512	3570
ĪU	382	345	207	361	60	90	135	323	165	61	151	2280	2125	4405
UM	315	270	255	300	150	105	135	300	90	105	90	2115	1215	3330
NEW	381	185	222	370	40	116	120	402	70	40	132	2078	1826	3904
NSU	240	240	345	376	90	150	150	297	105	60	226	2279	1283	3562
OSU	340	390	290	310	30	60	160	180	78	120	120	2078	1476	3554
PUC	109.5	180	120	330	60	175	85	405	60	60	140	1725	1940	3665
PCO	378	248	105	297	50	135	105	385	<i>7</i> 5	55	184	2017	2210	4227
NSE	446	342	279	320	124	180	144	506	126	108	104	2679	2143	4822
SCC	310	310	240	320	73	210	140	220	90	70	81	2064	2479	4543
SCO	390	260	250	550	80	100	100	230	160	80	170	2370	1864	4324
SNY	444	285	180	240	80	220	170	405	55	40	250	2369	2240	4609
MEAN	338	275	226	345	71	146	133	338	97	70	154	2187	1910	4103
SD	111	61	64	92	33	47	25	98	33	24	45	219	369	497

Table 2
The Total Curriculum Track Clock Hours For Each Optometry School

See Appendix 1 and 2 for school and curriculum track abbreviations

	BS	os	VS	PC	PM	VT	CL	OD	P	\mathbf{LV}	О	DE	CE	
UAB	12.8	4.8	4.8	7.6	1.7	3.6	3.8	11.7	2.3	1.4	3.1	57.5	42.5	
UCB	4.7	7.2	4.7	9.0	1.4	2.9	3.6	8.6	1.4	2.1	3.6	49.1	50.9	
FSU	4.9	7.4	6.7	5.3	1.4	4.9	3.2	8.8	2.5	1.4	3.2	49.5	50.5	
UH	6.4	7.1	3.7	12.5	2.0	3.0	3.0	7.4	2.4	1.0	3.0	51.5	48.5	
ICO	12.6	6.2	7.6	7.6	0.6	5.0	2.8	5.6	3.4	1.7	4.7	57.6	42.4	
IU	8.7	7.8	4.7	8.2	1.4	2.0	3.1	7.3	3.7	1.4	3.4	51.8	48.2	
UM	9.5	8.1	7.7	9.0	4.5	3.2	4.1	9.0	2.7	3.2	2.7	63.5	36.5	
NEW	9.8	4.7	5.7	9.5	1.0	3.0	3.1	10.3	1.8	1.0	3.4	53.2	46.8	
NSU	6.7	6.7	9.7	10.6	2.5	4.2	4.2	8.3	2.9	1.7	6.3	64.0	36.0	
OSU	9.6	11.0	8.2	8.7	0.8	1.7	4.5	5.1	2.2	3.4	3.4	58.5	41.5	
PUC	3.0	4.9	3.3	9.0	1.6	4.8	2.3	11.1	1.6	1.6	3.8	47.1	52.9	
PCO	8.9	5.9	2.5	7.0	1.2	3.2	2.5	9.1	1.8	1.3	4.4	47.7	52.3	
NSE	9.2	7.1	5.8	6.6	2.6	3.7	3.0	10.5	2.6	2.2	2.2	55.6	44.4	
SCC	6.8	6.8	5.3	7.0	1.6	4.6	3.1	4.8	2.0	1.5	1.8	45.4	54.6	
sco	9.2	8.5	5.9	13.0	1.9	2.4	2.4	5.4	3.8	1.9	4.0	56.0	44.0	
SNY	9,6	6.2	3.9	5.2	1.7	4.8	3.7	8.8	1.2	0.9	5.4	51.4	48.6	
MEAN	8.3	6.2	5.6	8.5	1.7	3.6	3.3	8.2	2.4	1.7	3.7	53.7	46.3	
SD	2.7	1.6	2.0	2.2	0.9	1.1	0.7	2.2	0.8	0.7	1.1	5.6	5.6	
														_

Table 3 U.S. Optometry Schools Ranked By Clock Hours In Each Curriculum Track

Schools ranked in descending order (most to least) according to the total number of clock hours dedicated to each curricular track.

(*) Denotes tie ranking with school listed below.

See Appendix 1 and 2 for school and curriculum track abbreviations

RANK	C BS	os	vs	PC	PM	VT	CL	OD	P	LV	0	DE	CE	TOTAL
MAINI			V 3	10	1 1/1	V 1	CL	OD		L.V		DE	CE	TOTAL
1	UAB	OSU	NSU	UH	UM	SNY	SNY	NSE	IU	OSU	SNY	NSE	SCC	SNY
2	ICO	ĬU	OSU	SCO	NSE	SCC	OSU*	UAB	SCO	NSE	NSU	UAB	SNY	NSE
3	NSE	NSE	FSU	NSU	NSU*	FSU	UAB	SNY*	NSE	UM	PCO	SCO	PCO	SCC
4	SNY	FSU*	NSE	UCB	UH	ICO*	UCB	PUC	ICO	UCB	SCO	SNY	FSU*	UH
5	SCO	UH	ICO	NEW	SCO	NSE	NSU	NEW	NSU*	SCO	ICO	UH	UH	IU .
6	IU	SCC	UM	IU	SNY	PICO	NSE	PCO	FSU	SCC	IU	IU	NSE	SCO
7	NEW	UCB	SCO	PUC	SCC	NSU*	SCC	FSU	UH	IU	UCB	NSU	UCB	FSU
8	PCO	SNY	SCC	NSE*	UAB	UAB	UM*	UCB	UAB	PUC*	FSU*	UM	IU	PCO
9	OSU	UM	NEW	SCC*	PUC*	PCO*	IU*	UH	UM*	NSU*	UH	FSU	PUC	UAB
10	UM	SCO	IU	UAB	IU*	UH	UH	IU	SCC	ICO*	NEW	OSU*	SCO	UCB
11	SCC	PCO	UAB	OSU	FSU*	UCB	FSU	UM	OSU	UAB*	UAB	NEW	NEW	NEW
12	UH	NSU	UCB	UM	UCB	NEW	NEW	NSU	PCO	FSU	PUC	SCC	UAB	PUC
13	NSU	ICO	SNY	PCO	PCO	UM	PCO	SCO	NEW	PCO	OSU	ICO	ICO	ICO
14	FSU	UAB	UH	ICO	NEW	SCO	ICO*	SCC	UCB*	UH	NSE	UCB	OSU	NSU
15	UCB	NEW	PUC	SNY	OSU	IU	SCO	ICO	PUC	SNY	UM	PCO	NSU	OSU
16	PUC	PUC	PCO	FSU	ICO	OSU	PUC	OSU	SNY	NEW	SCC	PUC	UM	UM

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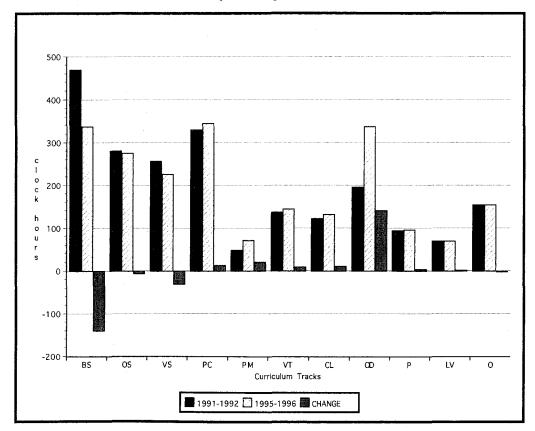
Table 4.
U.S. Optometry Schools Ranked By Percentage Of Clock Hours In Each Curricular Track

Schools ranked in descending order (most to least) according to the total number of clock hours dedicated to each curricular track.

(*) Denotes tie ranking with school listed below. See Appendix 1 and 2 for school and curriculum track abbreviations

RANK	BS	OS	VS	PC	PM	VT	CL	OD	P	LV	О	DE	CE	
1	UAB	OSU	NSU	SCO	UM	ICO	OSU	UAB	SCO	OSU	NSU	NSU	SCC	
2	ICO	SCO	OSU	UH	NSE	FSU	NSU	PUC	IU	UM	SNY	UM	PUC	
3	NEW	UM	UM	NSU	NSU	PUC*	UM	NSE	ICO	NSE	ICO	OSU	PCO	
4	OSU*	IU	ICO	NEW	UH	SNY	UAB	NEW	NSU	UCB	PCO	ICO	UCB	
 5	SNY	FSU	FSU	PUC*	SCO	SCC	SNY	PCO	UM	SCO	SCO	UAB	FSU	
6	UM	UCB	SCO	UM*	SNY	NSU	UCB	UM	NSE	ICO*	PUC	SCO	SNY	
7	NSE	UH*	NSE	UCB	UAB	NSE	FSU	FSU*	FSU	NSU	UCB	NSE	UH	
8	SCO	NSE	NEW	OSU	SCC	UAB	NEW*	SNY	UH	PUC	IU*	NEW	IU	
9	PCO	SCC	SCC	IU	PUC	UM	SCC*	UCB	UAB	IU*	NEW*	IU	NEW	
 10	IU	NSU	UAB	ICO*	UCB*	PCO	IU	NSU	OSU	FSU	OSU	UH	NSE	
11	SCC	SNY*	UCB	UAB	FSU*	NEW*	UH*	UH	NEW*	PCO	FSU	SNY	SCO	
12	NSU	ICO	IU	PCO*	IU	UH	NSE	IU	PCO	UH*	UAB	FSU	UAB	
13	UH	PCO	SNY	SCC	PCO	UCB	ICO	ICO	SCC	NEW	UH	UCB	ICO	
14	FSU	PUC	UH	NSE	NEW	SCO	PCO	SCO	PUC	SCC	UM	PCO	OSU	
15	UCB	UAB	PUC	FSU	ICO	IU	SCO	OSU	UCB	UAB	NSE	PUC	UM	
16	PUC	NEW	PCO	SNY	OSU	OSU	PUC	SCC	SNY	SNY	SCC	SCC	NSU	

Figure 1
The Mean Clock Hours For Each Track In The 1991-1992 And 1995-1996 Optometry School Curricula.



Helping the Needy and Enhancing Clinical Training in the Third World

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key element in any clinical training program is an adequate and interesting patient base. When a location distant from a densely populated urban environment results in inadequate patient numbers, several strategies are commonly implemented.

Abstract

The purpose of this paper is to report the clinical training and services resulting from activity in Mexico by - University – Volunterr irections: Optometric Services to Humanity (VOSH) student organization. Approximately 4000 patients are examined annually by VOSH in partnership with I-Care International and the Guarajuato Department of Infants and Family. The patient apails ability in Alexico seems involves when compared to examinations completed at eptometry schools in the U.S. Possibilities for expanding program or decemb

KEY WORDS: aptometric education, externship training, health services, patient care, leaching The clinics will adopt strict internal referral rules as a method which allows fourth year students to perform an adequate number of specialized diagnostic and treatment techniques at the expense of less experienced students. External rotations and satellite clinics are also used to further increase the number and types of patients. However, even with all these strategies in place, some training programs may still be searching for other avenues to improve their patient base. One such avenue would be an international approach which has been partially implemented by student organizations that schedule humanitarian trips to third world sites, but the focus of these trips has been on service and not on maximizing the training possibilities of the experience.

Third world countries, in particular, our geographic neighbor Mexico, have large populations that have no opportunity for the type of eye care available in more developed countries. While in recent years there have been attempts to create optometric training programs in such areas, many of the people in these countries

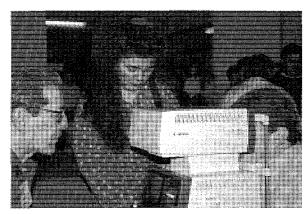
Dr. Horner is a member of the Faculty at the Indiana University School of Optometry. Ms. Lueck and Ms. Reid are Class of 1998 optometry students.

remain in need of basic eye care services. This unfortunate condition has tremendous potential for ameliorating the problems with low patient numbers at some schools and colleges of optometry. Currently the efforts of some student organizations like the Volunteer Optometric Services to Humanity (VOSH) serve these populations, and at the same time, the students are provided with unique learning opportunities.

At Indiana University (IU), both student VOSH and the Fellowship of Christian Optometrists travel to areas which have large populations in need of care. IU's student VOSH trip or mission works well as both a friendly humanitarian effort for the people of Guanajuato, Mexico, and as a rich learning experience for students. Could expanding the opportunities and experiences from these trips serve as a basis for developing international strategies by which optometry schools and colleges could improve the numbers and quality of patient contacts for students? In this detailed report of VOSH's experiences in Mexico, we hope to stimulate thought on how these trips could be more productive and suggest possibilities to extend our presence beyond one large five-day campaign per year.

Preparation for the Trip

The trip to Mexico has taken place each year during the week of the university's spring break. During the three recent trips (1994 through 1996), approximately 4,000 patients were seen each year during the five-day working schedule. The typical spectacle inventory for such a trip approaches 15,000 verified and catalogued pairs of glasses. An extensive inventory is needed in order to have enough spectacles to closely match the patients' refractive needs. Three organizations contribute to the success of our trips to Mexico. The Lions Clubs and others donate used glasses to VOSH, and through the fall and first half of the spring semester, the VOSH members sort, verify and clean the glasses. Students with all levels of experience are invited to help. First year students are taught verification at the beginning of the fall semester so they can contribute to this effort. Second year students manufacture a limited number of new pairs of glasses during their training in the Ophthalmic Optics course. Each year



Patients visit the autorefraction station after history and acuity have been taken.



The patients wait to be called into the dispensary area after the best choices of used glasses have been selected.

the students in VOSH devote approximately 500 hours to produce the inventory. Students also help with fund-raising activities to offset travel expenses. Approximately 25 students from the VOSH organization travel to Guanajuato. The number of optometrists that accompany the students has ranged from 2 to 5 in recent trips (see Table 1).

The inventory of glasses is supplemented by I-Care International, which has partnered with the student VOSH organization for the past three missions to Mexico. This organization of volunteers supplies an additional 10,000 pairs of glasses to bring the inventory to a reasonable number with respect to the anticipated demand in Mexico. I-Care typically organizes three other humanitarian trips to Mexico each year in addition to the joint trip with IU. Before the trip with IU, I-Care members help coordinate travel arrangements and take most of the responsibility in transporting the spectacles through Mexican customs. Most of the members of I-Care are bilingual and are a tremendous asset in all facets of the trip. I-Care provides and operates two autorefractors on the mission as well.

The third organization that is critical to the success of the VOSH mission is the Guanajuato Department of Infants and Family (DIF). Each state of Mexico has a DIF organization charged with supplying support for the indigent of the state. The state of Guanajuato encompasses 11,802 square miles and 2,258,000 people (1968 estimate).2 DIF has a budget from the state government which is nominally headed by the spouse of the Governor and has approximately employees. The average income in the state of Guanajuato is between \$6.00 and \$7.00 per day and people receiving services through DIF have annual incomes of less than \$1,000.00 per year. (C. P. Lopez, personal communication, March 15, 1995) The DIF organization assists with customs,

immigration and transportation of materials and students to the city of Guanajuato. DIF has sole responsibility through the efforts of its social workers to select and transport the patients who will be seen by the VOSH group. In our mission's current form, the participation of DIF and I-Care are critical to the success of the mission. In the past, DIF has also pro-

vided room and board for the VOSH and I-Care participants.

The Five-Day Campaign

The DIF compound where the patients are seen has two relatively new brick buildings and a large patio. The three-story administration building is used by VOSH to examine the patients. The other building houses an outpatient clinic which includes one refracting lane (which is, unfortunately, only rarely used by an eye care practitioner), several exam rooms for dentists and physicians, a large physical training area, and a pharmacy. The large patio area has sufficient space to seat 300 people.

Patients are preselected by DIF. The people in need of care are transported to the DIF compound by bus. The trips to the city of Guanajuato from the other areas of the state can last more than six hours. Upon arrival, each individual proceeds through a series of stations. First, in the patio area, they are seated in a large tent where an announcer instructs groups of 300 via loudspeaker on how to respond to the Landolt C visual acuity test. At the conclusion of the training the patients are escorted to the first station. At the first station, limited histories, which consist principally of a chief complaint and a personal/family medical history, are recorded along with a measure of the distance visual acuity for each eye. After visual acuity testing, the patients are escorted to one of the two autorefractors operated by the I-Care volunteers.

At this point, VOSH members begin working with the patients. They provide each patient with an initial screening which includes pupils, versions, confrontation fields, and direct ophthalmoscopy. In addition,

Table 1
VOSH Trip Members Grouped by Educational Experience

Number attending by	year in optometry school
1995	1996

Training	1995	1996
1st year	7	10
2nd year	5	5
3rd year	6	4
4th year	2	6
Optometrists	2	3

Figure 1
The Age Distribution Of The Patients Seen On The 1995 Trip To Guanajuato

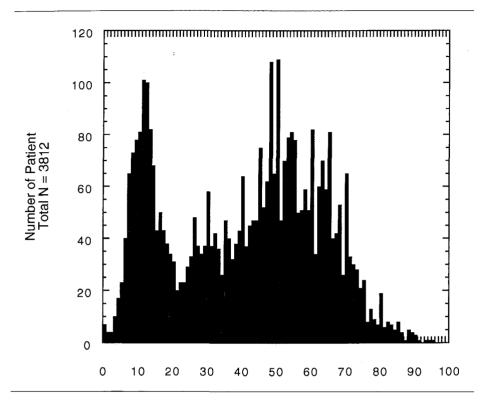
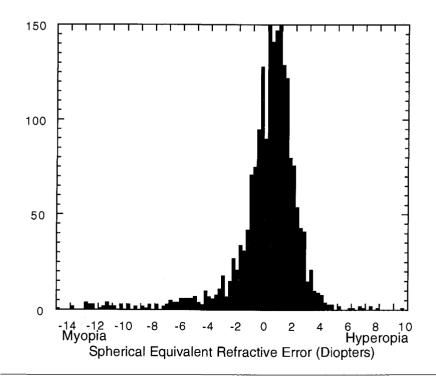


Figure 2
The distribution of sphere equivalent (mean sphere) for the right eyes of the patients seen on the 1995 trip to Guanajuato. The peak of the distribution was cut off so the tails of the distribution can be seen. The peak ascends to 1900 patients in a single column corresponding to plano refractive error.



retinoscopy and cover test are performed on all children. Using the results of the screening and questioning the patients about their chief complaint, a problem-based approach dictates the additional testing administered to each patient. Several interpreters work with the VOSH staff to interview each patient again in order to ensure that chief complaints and relevant history are understood and addressed. Blood pressure testing, pupil dilation, binocular indirect ophthalmoscopy, biomicroscopy (both hand-held and conventional slit lamps have been available), tonome try, and additional retinoscopy or trial frame refraction are employed as indicated.

When the appropriate diagnostic procedures have been completed, the results for each patient are reviewed by senior members of the VOSH (typically one of optometrists). Additional testing may be requested and completed and then a plan is written for each patient which includes the spectacle Rx and a referral with tentative diagnosis to the DIF medical staff, if needed. The longterm management and appropriate surgical interventions are arranged by the DIF medical staff for the referred patients. Patients needing over-thecounter and prescription medications are sent to the DIF pharmacy, and medications are dispensed with minimal charges.

Patients requiring a spectacle Rx are escorted to a seating area outside the room serving as a dispensary. The dispensary contains the numerous boxes of sorted and labeled spectacles. The dispensary is operated by I-Care volunteers, DIF interpreters, first-year optometry students and intermittently by the other VOSH students during their breaks from the diagnostic testing. The patients are called when the best spectacle matches have been found and the glasses are adjusted for comfort. Acuities at both near and far are checked. Sunglasses are dispensed liberally as long as the inventory lasts (see discussion below). Should a referral for further medical care be indicated for either chronic eye disease or systemic problems, then the patient is escorted to the DIF medical staff.

Results

Figure 1 shows the age distribution of patients during the 1995 trip. A total of 3812 patients were seen dur-

ing the five working days of that trip. The age of patients ranged from infants who were only a few months old to six patients who reported their age to be over 90 years. A large portion of children were selected by the DIF personnel to be tested and contributed to the bimodal nature of the distribution. Figure 2 shows the distribution of the mean sphere refractive error for the right eyes of the patients. Figure 2 does not show the peak of this distribution. The column in the figure that corresponds to plano refractive error extended to 1,900 patients and was cut off to better show the tails of the distribution. Mean sphere refractive error ranged from +9.75 D of hyperopia to -15.00 D of myopia.

The distribution of astigmatism was found to be as follows. A large number of patients (2,270) had spherical refractive errors (see Discussion for more information about the large number of patients who were recorded as emmetropes). Astigmatism of greater than 3.00 D was found in 103 patients, which left about 38% of the patients with astigmatism of between 0.25 and 3.00 D.

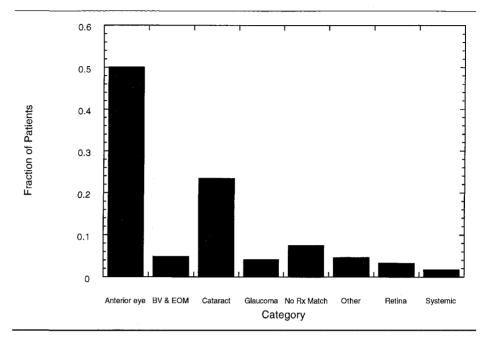
We referred approximately 20% (726) of the patients to the DIF medical staff for conditions that required continued treatment or other medical intervention. Figure 3 incorporates 8 referral categories to show the general distribution. A description of these categories can be found in Table 2.

Fifty percent of the patients being referred had problems with the anterior eye. Of these patients, 75% (or 37.5% of the total referral group) appeared to have climate-related irritations. Extensive pterygiums were quite common. Cataracts were the second most common category of conditions, making up 23% of the referred patients. The inability to adequately match the spectacle prescription well enough out of the VOSH and I-Care inventory was also a basis for referral, accounting for approximately 9% of the total referral group. Retinal problems either from primary retinal disease, glaucoma, or systemic disease in aggregate accounted for just over 9% of the patients and approximately 5% of the patients being referred fell into the "other" category.

Discussion

To interpret these data it is helpful to know that the state of Guanajuato

Figure 3
The Distribution By Category Of The Patients Referred To The Medical Staff Of The Department Of Infants And Family



is located on a high plateau in the Sierra Nevada Mountains. It is located at approximately 21 degrees north latitude with an elevation of about 1 mile. The general climate is arid and the sun shines brightly most of the time. The chief ocular complaint was red, watery and sometimes itchy eyes.

The impact of solar exposure strongly contributes to the chief ocular health complaint and referral numbers. The complaint of red, watery eyes could be considered ubiquitous in this population. If the inventory had permitted, sunglasses would have been recommended for every patient.

Many presbyopes were seen, so there was a great need for reading glasses. Because distance acuity was measured in the first test station only and the patients found near tests problematic in some cases, it was common to prescribe add power by age. The problems found in near point testing were generally communication-based with illiteracy contributing significantly. Many older patients had near complaints for tasks other than reading. It was very common for

Table 2
Description of the Referral Categories Shown in Figure 3

Category Anterior Eye BV & EOM Cataracts Glaucoma No Rx Match Other Retina Systemic

Description or Involved Morphology

Cornea, Conjunctiva, Lids or ocular adnexa Extraocular Muscles including palsies or strabismus Crystalline Lens Optic Nerve, or suspicious findings on fields or IOP

Inability to match spectacle Rx from inventory
Head trauma, GI and sinus disorders, migraines
primary retinal pathology

Secondary retinal pathology, typically associated with hypertension and diabetes

to know that the state of Guanajuato

elderly females to report difficulty with sewing.

If the ordinate of Figure 2 was extended, it would show 1,900 emmetropes. Since the presenting patients were selected as having problems by the DIF staff, this number of emmetropes may seem high. Several reasons contribute to the large number of plano prescriptions recorded and entered into the database that allowed us to report this limited analysis. When patients required either no spectacle prescription or a reading Rx only (with satisfactory distance acuity) it was common to specify plano or just the add power as the Rx to streamline the written detail on each patient's exam form. In addition, a few patients with acute ocular health problems were not evaluated for refractive error because immediate intervention was the priority.

Student Value

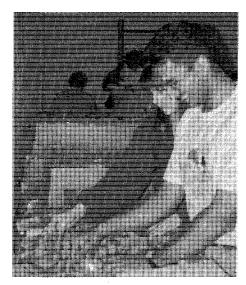
The value of these experiences varies, depending on the previous training of the students. First year students mainly gain experience in the delivery of spectacle prescriptions, working with patients and witnessing the impact of the skills they will be learning on needy patients. When time permitted, first year students were also introduced to direct ophthalmoscopy and retinoscopy by the more advanced students.

The second and third year students have some previous clinical background and training, and probably learn the most by this type of experience. The number of patients seen by a student on just one VOSH trip will compare quite favorably to the number of patients the student will see through the second and third years of training at IU. For the purpose of this discussion we will compare estimates of full exams to the numbers of patients that present at the DIF clinic. In truth, such a comparison is not entirely fair in that the exam numbers at the university clinics are for comprehensive exams with extensive supervision, whereas in Mexico, the extent of the exam is determined partly by the limited initial screening and the testing needed to diagnose the patient's complaint.

During the summer between the second and third years, IU students have the opportunity to see a maximum of 50 patients for basic vision examinations. These students are

scheduled for a relatively intense three-week period. During that period the students are scheduled for 15 patients per week for the first two weeks and approximately 20 patients for the third week. Unfortunately the co-authors' experience was that the number of full exams completed during the summer session was closer to 30 exams.

In the third year, the students have the opportunity to perform approxi-



Optometry students look through the inventory to select glasses in the dispensary.

mately 120 full examinations. They are scheduled about one full day per week for the 30 weeks of the fall and spring semesters. The chief preceptor (K. Tonekaboni, personal communications, August 20, 1996) reports that the patients are scheduled for approximately 75% of the available times. Thus, a student performs approximately 120 exams through summer following the second year and the two semesters of the third year. By making just one trip to Guanajuato the students are likely to have examined nearly twice as many eyes as their immedi-

ate peers and certainly see numerous cases of significant pathology.

All students and the optometrists that volunteer for these trips are rewarded by the opportunity to see uncommon conditions and the positive fulfillment received when helping others.

One exceptional feature of this type of training experience is the individual responsibility that the students feel to their colleagues. Ensuring that fellow students have a rich exposure to eyes with unique conditions is a very different learning environment than in our teaching clinics where the responsibility to ensure the quality rests mainly on the faculty.

It can be seen from this report that there is a large population in need of optometric care in reasonably close geographic proximity to schools and colleges of optometry in the U.S. Guanajuato is only one of the 30 states of Mexico. Although there are obvious problems in establishing contact between the schools and colleges and the Mexican organizations like DIF, when a program is organized, all students have a great educational and

humanitarian opportunity.

Many improvements are still needed in the operation of these missions. Developing databases for the spectacle inventory would free students to have a richer diagnostic training and improve the matching of the spectacle prescriptions to the patient's Rx. A clear statement by administrators from the schools and colleges that faculty participation would be recognized in tenure and promotion would make these trips more attractive to the faculty and would be certain to



A patient tries the glasses assisted by A VOSH student volunteer and an I Care interpreter.

improve the educational experience and quality of care. More formalized relationships with these third world settings would also spur improvements in equipment availability and the education of the local practitioners through programs at the mission site.

The Guanajuato DIF has made a request to IU to be a regular external rotation site. For reasons discussed in this report, this invitation is very attractive. One of the logistical problems is the difficulty of adequate supervision on a regular basis. Several strategies might be considered to have schools and colleges support full-time presence in this sort of setting. Sufficient funds are likely generated directly from the tuition of students that could pay one full supervising clinician to live in Mexico. If a full-time supervisor is impossible, then there might be a real-time communications solution (i.e., electronic mail and images) in our future between the third world site and the faculty of the university. Another alternative would be establishing rotating schedules of residents, lay optometrists and faculty; perhaps several schools could jointly provide supervision for limited periods in a single clinical site.

Schools and colleges of optometry with a concern for adequate patient numbers should consider expanding their programs into the Third World where the needs of the population are great and the opportunities for optometry students are vast. We hope this paper will encourage students, faculty, and administrations to continue to develop more experiences for their students through humanitarian trips and to introduce new ways to bring more students in contact with these populations.

Acknowledgments

We would like to thank the following for their generous donations to VŎSH missions for our Guanajuato:

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Appendix

Organizations That Support Humanitarian Missions

Christian Fellowship of Optometrists (FCO) International was incorporated in 1986. It began as an informal student organization at the University School Optometry in 1971. FCO was started as a vehicle for the spiritual growth and fellowship of its members. FCO now has numerous student chapters at schools and colleges of optometry and individual O.D. membership throughout the United States and Canada. Some student chapters organize and carry out short-term mission trips. FCO has a full-time eye clinic in Haiti, helps to facilitate the placement and retention of optometrists in fullor part-time optometric missionary activity, maintains a placement service, and has an annual FCO Fall Conference. An affiliate group within FCO called New Vision Ministries is devoted exclusively to arranging short-term mission trips for practicing optometrists, primarily to Central America. For questions about FCO, either write Dr. Joe Segree, Executive Director, P.O. Box 812, Radcliff, KY 40160, call 502 877 2600, or send an email inquiry to fco@ekx.infi.net.

I CARE International was formed in 1989 by Illinois Optometrists, Dr. Philip Ortiz, Dr. Charles D. Cools, and a group of lay people as a non-profit volunteer organization to provide eye care services to the underserved people of the world. Since 1977, I Care has provided tens of thousands of people with free eye care. The volunteers have worked in countries such as Mexico, Guatemala, Honduras and Ecuador. A typical I CARE mission team will provide vision services for periods of five days or more examining approximately 500 to 750 people per day and fitting them with used eyeglasses. An inventory of a minimum of 10,000 used eye glasses is needed for each mission. The inventory is assembled beforehand through the efforts of local volunteers and inmates of Dwight, Kankakee and

Sheridan correctional centers. This charitable organization can be contacted at (815) 942-8004 or write 880 Bedford Road Morris, Illinois 604500.

Volunteer Optometric Services To Humanity (VOSH) International's primary mission is to facilitate the provision of vision care world-wide to people who can neither afford nor obtain such care. VOSH International accomplishes this primary goal by service as a coordinating body for affiliate and international chapters. In 1972 a Kansas optometrist, Dr. Franklin Harms, started collecting; used glasses and organized them into a "library" that could then be taken to other areas of the world where eye care was unavailable. The formation of the Indiana University student VOSH organization occurred as an out growth from the Indiana Chapter of VOSH. More than 20 years ago, Dr. W.E. Marshall found the Indiana Chapter. Today, the VOSH Indiana Chapter travels to third world countries (mostly Honduras) bringing hope and help to the poor.

The Indiana University student VOSH organization was organized in 1979. Initially, a few student members traveled on humanitarian missions with other student VOSH organizations and the Indiana state chapter. The student VOSH group also provided free eye care to homeless and needy patients in the southern Indiana area. By 1982 student VOSH had expanded to organizing their own missions to various sites in Central America. VOSH International can be contacted at 505 South Clay Taylorville, Il 62368. Write the Indiana at PO Box 19028, Chapter Indianapolis, IN 46219. To contact the IU student VOSH organization write IU/School Dr. Horner at Optometry, 800 Ε. Atwater,

Bloomington, IN 47405.

ASSESSING OUTCOMES IN OPTOMETRIC EDUCATION

A Commentary by the Council on Optometric Education

Introduction

The higher education community is paying considerable attention to the need to assess programmatic and educational outcomes of educational programs and use these assessments to improve the quality of such programs. The desire by public officials that higher education become more accountable is a major driving force behind the emphasis on outcomes assessment. Of course, an equally valid and important reason is the desire of individual educational institutions to know whether, in fact, they are achieving what they desire to achieve.

Recent emphasis by accrediting bodies, governmental agencies, and the general public has brought outcomes assessment into the forefront, and higher education is being held accountable to produce desired outcomes. Legislatures are becoming more involved in curricular matters to further the accountability process.

The Council on Optometric Education (COE) recognizes the importance of identifying and assessing educational and programmatic outcomes as a means to define and measure the quality of educational programs. It has woven outcomes assessment throughout its Standards of Accreditation. The Council offers this commentary so that optometric educa-

tors and administrators will understand what outcomes are, their importance, and how they relate to the quality of optometric education.

What are Outcomes?

Outcomes are the results of any activity or program. They are the objectives that are established prior to implementing these activities or programs. Statements of desired outcomes may be derived from answers to the following questions:

- What do we want to accomplish?
- What is it we say we do?
- What is it we want our graduates to be able to do?

Broad statements of desired outcomes of a program or institution (e.g., possible answers to the first two questions listed above) should be found within the university or school mission statement. Developing specific educational outcomes of particular educational programs is the responsibility of the faculty of that institution. ASCO should develop suggested educational outcomes as a guide for faculty. Faculties at individual schools and colleges of optometry can modify these suggested outcomes by considering the above questions within the context of their own institutions and missions. Examples of different levels of outcomes at schools and colleges of optometry are:

Outcome for an institution:

 maintain a diverse student body with minority representation of at least equal proportions to minority representation in the population of the state.

Outcome for a program:

 develop future leaders for the profession.

Outcome for a faculty:

 maintain an annual average of three publications in refereed journals per faculty member.

Outcome for individual students:

manage an uncomplicated glaucoma patient.

Before determining specific outcomes, an institution should have a vision of its purposes(s) clearly conveyed in its mission statement. Appropriateness of outcomes for a particular school is determined by relating the outcomes to the institution's purposes. Good outcome statements should have the following characteristics:

- Clear and understandable. They avoid jargon; discipline-specific vocabulary; and complicated, intricate phrasing.
- Direct and explicit in meaning. They avoid generalities.
- Reflective of current philosophies, actions, and intentions. They are relevant to the mission of the institution. Good statements of outcomes avoid outdated notions, statements that may conflict with overall direction, and ideas that may sound good but no one intends to carry out.
- Written in short, simple sentences that state only one thought. They avoid complex statements with multiple concepts.
- Quantifiable and measurable.
 Measurement may be short-term
 or conducted in the future.
 Outcome statements should avoid
 terms that do not imply or allow
 for measurement.

Key to the development of outcomes specific to the preparation of practitioners at the entry-level is a definition of entry-level practice and the competencies (educational outcomes) of an entry-level optometrist. Therefore, each faculty needs to identify the entry-level outcomes of their OD programs in terms of skills, competencies, and behaviors.

What is Outcomes Assessment?

Assessment is a process of evaluation, and outcomes assessment is simply the evaluation of results. More thoroughly defined:

Outcomes assessment is the process of collecting information about the attainment of a stated desired outcome of an academic endeavor; analyzing that information by comparing and contrasting it with previously established statements of mission, goals, and objectives; then using that information to validate the existing effort or to make recommendations to guide improvement.¹

Outcomes assessment answers the questions:

- Are we accomplishing what we intend to accomplish?
- How well/to what degree do we do what we say we do?
- How well are students/graduates able to do what we want them to be able to do?

Assessment is not new to higher education or schools of optometry. What is new are the external pressures to use outcomes as a means to assess and improve the quality of educational programs. Outcomes assessment is a parallel concept to total quality management (TQM) and continuous quality improvement (CQI) in business.

Outcomes assessment should be an important component of the curricular planning process. Planning and delivery of the curriculum should include desired outcomes for students to achieve; integrating instructional strategies, context, and structure to facilitate student achievement of outcomes; providing feedback to improve teaching and learning; and reporting on degree of achievement of the desired outcomes upon graduation.

What are Outcomes Data?

Outcomes data are any forms of documentation or evidence of achievement, or lack thereof, toward meeting a certain desired accomplishment or outcome. Examples of outcomes data include:

- Written evaluations of students' performances on externship; Performance appraisals of departmental staff;
- Self and peer evaluations of students, faculty, staff, and administration performance;
- Faculty performance evaluations by students;

- Students' reflective responses following a course lecture, laboratory, or other learning exercise;
- Students' final course grades;
- Scores and pass rates of graduates on examinations for licensure;
- Scores and pass rates of students on NBEO examinations;
- Reported success of graduates in professional practice;
- Measures of alumni satisfaction with the education obtained;
- Grant proposals written;
- Grant proposals funded;
- Continuing education programs delivered;
- External funding attracted to the school or college;
- Papers published.

The list could go on, but even this short list shows a wide diversity of outcomes data. Some outcomes are quantitative (examination scores), others qualitative (faculty appraisals). Some refer to cognitive measures of

ASCO
should develop
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education (test or performance results), some to a mixture of cognitive and affective measures of education (student satisfaction), and some to activities not always a part of the educational program (research results). Some can be gathered immediately (course grades), while others must wait for the passage of time (success in practice).

Outcomes data themselves are simply pieces of information. They become important to the determination of quality only when they are assessed and interpreted in the light of defined purposes.

There is no one complete set of outcomes that can be routinely applied to all institutions. Outcomes for a program or institution must be specific to local strengths, purposes, and mission. Selection of outcomes data to be used and the ways they should be interpreted requires individual attention by each institution (indeed, by each component of the institution). Effective use of outcomes data requires identifying and using multiple sources with respect to each purpose. Use of several pieces of outcomes data to assess an outcome helps guard against the error of giving undue weight to any single piece of outcome information.

Why Assess Outcomes?

Because outcomes assessment is a measure to determine the extent to which objectives have been achieved, it serves two ultimate purposes:

- to validate (or invalidate) what is currently happening; and
- to guide and improve efforts toward achieving predetermined goals.

A process for outcomes assessment is linked to professional program accreditation by COE. In its 1994 *Accreditation Manual for Professional Optometric Degree Programs*, COE states that,

The essential purpose of the self study is to assess the results — the outcomes — of the institution's efforts in pursuit of its mission and goals. Whereas mission and goals statements indicate the desired outcomes, statements of objectives should serve as specific criteria by which outcomes may be assessed.

Outcomes assessment makes sound political, managerial, economic, and educational sense. It is especially timely for those schools undergoing curricular revision and redevelopment. Restructuring provides an opportunity to integrate the outcomes assessment process as a fundamental component of the new system.

Educational Outcomes and the Curriculum

Educational outcomes are critical to the design, efficiency, and continuing quality assessment of the curriculum. Educational outcomes (or entry-level competency statements or abilities expected in a graduate of an optometric program) "define" the graduate by what he or she should be able to do immediately upon graduation and throughout his or her practice career.

Using outcome competencies or abilities provides the faculty, through its curriculum committee, with a powerful tool to devise course sequences and individual courses; to decide on course content; to develop course objectives consistent with outcomes; and to decide on teaching strategies and methods. Of course, continually comparing the curriculum against its intended purpose(s) is the essence of continuous curricular evaluation and improvement.

Assessing the degree to which students are achieving educational objectives must be a major component in curricular revision. How else will it be "known" if the curriculum is working? Curriculum committee members and assessment activity planners should work closely together to ensure that those assessment activities and curricular changes being implemented are interwoven to achieve desired institutional outcomes.

Knowing how well students are doing (student assessment) directly reflects on how well the institution is doing its job. An assessment plan should map out how all assessment activities, including those at the "cellular" level (e.g., individual student, staff, faculty assessment, etc.) are inter-connected to achieve the ultimate desired institutional outcomes. However, this does not mean that all assessment activities need to be "mapped" into a greater plan; individual faculty should continue to perform "classroom research," for example, using different assessment techniques with students.

Accreditation - Why is COE Interested?

Stimulated in part by the Department of Education, accrediting agencies either have adopted explicit standards dealing with outcomes or have placed an increased emphasis on those already in place. A 1991 study by the Council on Postsecondary Accreditation showed examples of outcomes in accreditation standards and guidelines, in policy statements, and in the practices of the agencies. (2) Seventy-six agencies provided information for a bibliography consisting of 444 entries related to outcomes assessment.

COE recognizes the importance of outcomes assessment in understanding, measuring, and improving the quality of education. Consequently, outcomes assessment is woven throughout all the COE Accreditation Standards.

COE Standards That Address Educational and Programmatic Outcomes

Specifically, COE Standard I establishes the importance of schools developing and maintaining a system of evaluating their programs and education against specific outcomes:

The school or college must have a published statement of institutional mission, goals, and objectives, and a system for evaluating the effectiveness of its program(s) and outcomes relative to this statement.

Within Standard I, the following further refine COE's requirements:

1.3 The school or college must publish specific objectives which indicate the steps to be taken to achieve the goals of the institution. The educational objectives must be consistent with expectations for the entry-level practice of optometry.

1.4 The school or college must maintain a system that evaluates the extent to which its institutional and educational mission, goals, and objectives are being achieved.

1.5 As part of its ongoing process of planning and self-study, the school or college must consider on a regular basis its institutional mission, goals, and objectives and revise them as necessary.

It is important to understand that COE is not dictating the nature or scope of outcomes that a school should identify and assess. COE requires that schools define their outcomes and institute a process for assessing them and using these assessments in an organized program of quality improvement. COE's site visit teams will audit school assessment activities to verify that they comply with COE standards.

What COE Expects in Self-Studies and Annual Reports

As a result of this explanation, COE expects that schools will include in their self-studies the specific outcomes they have selected to assess, the methods of assessment, how schools are using the assessment data, and examples of changes (if any) such assessments have initiated. Similarly, annual reports should provide information related to the outcomes that have been assessed during the period covered by the report and the changes (if any) as a result of these assessments.

ASCO's Efforts

It falls properly to the professional association of schools and colleges of optometry (ASCO) to develop guidelines, sample outcomes, and recommended procedures to assist its member schools to implement successful outcomes assessment processes. ASCO is well along in achieving these goals. It has a task force on outcomes assessment which is charged to develop a recommended process for schools to use in identifying and assessing their outcomes. In addition, ASCO held a Critical Issues Seminar in 1997 to define the competencies of an entry-level optometry graduate.

Indeed several individual schools have held faculty retreats or charged committees to develop outcomes that the school should assess on a regular basis.

Conclusion

Identifying and assessing programmatic and educational outcomes is a process that enables individual schools and colleges continually to evaluate the quality of its enterprise. In some respects, schools and colleges have been performing outcomes assessment for years but called the process by different names. What we call it is not important. What is important is that schools and colleges of optometry in partnership with COE commit to the continuous improvement of the quality of optometric education. Identifying and assessing outcomes is one of the most efficient and assured methods of achieving that end.

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COMMENTARY

Tenure for Clinical Faculty

Roger Wilson, O.D.

Abstract

Chart the graps brown as a faculty right mes lated increasous challenges and today remaines combroticesso, and correspo entite outmoded. Nevertheless numerous schools and colleges still offer tenure track faculty appointments. Granting tentiere de celoqueil fequieux tentis la create eren granter terkerheinig for hold faculty and administrators. Administrations are responsible for minimuming mestitutional balance and justifying mistrational need for tenural tweety, metading how and refry clerical faculty possess o unique institucional value and are essential to the attributed of the schools mission. Climical facility who wint a life-long career in patient care and climent educathere are responsible for applicabling and contributing to the institution's mission and submerallists consistent poth albeit tenund fieldly. The administration is also responsible for providing apportunities for faculty greath, and detelopment so that bruity can accurre the necessary createstials for a tenerous approximitation. This itual responsibility assures that studeath and other consumers of a school's programs will enjoy a quality clinical education. This paper discusses the mature of terrory for climical educators, and describes the rights and responsibilities of clinical faculty, administraturs. and the institution in embling faculty to office forces

Key Words: tenure, clinician educators, scholarship, career guidance

Introduction

What are the traditional elements for tenure eligibility?

Historically, tenure for faculty whose primary responsibility is clinical education, that is "clinical faculty," has received mixed support from professional schools and colleges, including optometric institutions. Some of the underlying

Dr. Wilson is professor of optometry and chair of the faculty at the New England College of Optometry. He is also chair of external clinical programs at NEWENCO, and associate director of eye care. assumptions for schools that do not offer tenure to clinical faculty are: (1) that only faculty who are "essential" to an institution's mission should be tenure eligible, (2) tenure should only be granted to faculty who have a demonstrable value to a college through the advancement of a school's reputation, and (3) that clinicians can earn an additional income through clinical practice and are therefore not solely dependent upon their faculty appointment as a primary career option and/or source of income. Tradition links these underlying assumptions for the award of tenure primarily to faculty with didactic and research appointments.

Likewise, when tenure is granted at a school or college of optometry, eligible faculty are typically academic and/or research oriented. Until recently this same tenure eligibility pattern has been seen in medical schools. However, in the past ten years medical schools have begun the process of changing faculty appointment systems, promotion, and tenure eligibility to include career clinical faculty. These changes have come about as a result of a rethinking of institutional missions, including a recognition that all professional degree program faculty contribute differently, yet equally, to an institution's mission. This paper will discuss the author's perspective on how clinical faculty at the schools and colleges of optometry can begin to influence their respective institutions so that they qualify for tenure eligibility.

Discussion

Is tenure for the clinician an academic or organizational/political process, or both?

It is the author's opinion that a successful outcome for the granting of tenure to clinicians is contingent

upon a clinical faculty's ability to effectively contribute to and understand an institution's mission, and to some degree its politics. While faculty do have some input into institutional policies, tenure eligibility is often decided at an administrative level, with the direct involvement of a dean, president, and a board of trustees. Tenure is commonly viewed as appropriate only for certain faculty (i.e. primarily academic/research faculty), and then only for those select faculty who are deemed "essential" to the stability, growth, and advancement of the school's reputation.

This observation leaves an impression that academic and research faculty are essential to an institution, while clinical faculty are somewhat expendable. Bickel describes the process by which some U.S. medical schools have begun to recognize that many different types of faculty (including teachers who are also clinicians) are both valuable and essential to a medical school, and that all faculty should be given adequate security. This change in thinking about the role and value of the clinical teaching faculty in medical schools has come about as a result of changing patterns in the delivery of health care education, managed care and the related income generated by clinicians in teaching hospitals, and a reshaping of the thinking of medical school administration and governance about the institutional value of lifelong career clinical faculty.

In essence, the trend toward granting tenure to clinicians may be less related to institutional need in the traditional sense (especially since many professional schools are recognizing the value of attracting and retaining talented and experienced clinicians), and more linked to changes in health care delivery, the redefining of a school's mission to include teaching as an essential

element, and the institution's politics.

How have medical schools dealt with tenure for clinician educators?

Granting tenure to faculty who are clinicians with major educational responsibilities continues to evoke much dialogue and uncertainty within medicine. While Halperin questions the relevance of offering tenure to faculty who are primarily employed to provide clinical care, some medical schools have taken a realistic, practical, and even proactive approach by reforming their institutional tenure policies to include clinical teaching faculty. Lovejoy and Clark have recently described how Harvard Medical School enacted changes to its definition of faculty and promotion and tenure policies by creating new categories of faculty: the teacher-clinician and the clinicianeducator. These tracks were created to ensure that Harvard could attract and retain talented clinicians who desired a career in clinical medical education. The appointments differ on the emphasis of assigned responsibilities in the areas of clinical care and clinical teaching (however teaching always plays a significant role in promotion and tenure reviews), and scholarship/research. Both the teacher-clinician and the clinicianeducator are tenure track appointments, with tenure being granted at the time of promotion to professor. As a result of these changes, Harvard now recognizes and promotes the institutional value of clinical faculty who are extensively involved in clinical care and clinical education. To support faculty in these two tracks, Harvard also created different interpretations and criteria for scholarly contributions. This was accomplished by linking the types of scholarship expected from faculty to their job responsibilities. These provocative outcomes from Harvard have created a cultural shift there, one that acknowledges and values all faculty as essential to the organization.

Harvard Medical School is not alone in its efforts to change the status of its clinical teaching faculty. In other medical schools that grant tenure, there is a trend toward recognizing the institutional need for faculty clinicians, and to grant tenure to those who are worthy. These changes in medical school tenure policies are certainly worthy of study at the schools and colleges of optometry, especially since the future success of optometric education will be increasingly dependent upon the contributions and productivity of a talented clinical faculty with excellent teaching skills.

Why are clinical faculty essential faculty?

A quality clinical program is an essential element of every optometric institution's success, and the clinical faculty are an integral part of that success. Equally important is the overall strength of the credentials of the clinical faculty. Without a strong clinical faculty, a school or college of optometry simply will not prosper.

Who are the "essential" faculty at an institution, how do they become essential, and who determines which faculty are essential?

Research faculty, and especially those who receive significant grant funding, are considered essential to most professional institutions because they enhance the reputation of their institutions. They also bring revenues into a program. Clinical teaching faculty produce similar outcomes for an institution, yet are not always viewed as having similar institutional "worth." The author believes that this dilemma is as much self-perpetuating as it is real. Clinicians can help to create a cultural shift within the thinking of the institution so that they are viewed as important and essential to the mission. To accomplish this objective, a strong clinical program would benefit from having an articulate and persuasive leadership within its faculty and clinical administration. Clinical faculty, and those who seek change in institutional policy toward tenure for clinicians, will also need to become politically involved so that all levels of the institution can appreciate the teaching and other major contributions of clinical faculty.

An organized, systematic, and ongoing involvement in faculty

governance issues can be instrumental in promoting the value of clinical faculty. To be effective, clinical faculty should become more visible and participate at all levels of an institution — within the faculty ranks, at the departmental level, at the dean's level, at the level of the president, and with the board of trustees. Through this process of active involvement, the entire organization can gain an appreciation that clinical care and clinical teaching are as essential to the institutional goals as didactic teaching and research. An additional outcome of this process is an institutional appreciation of the need for attracting and retaining an innovative, competent clinical faculty who are dedicated to excellence in patient care and committed to clinical education.

Another method to ensure that the clinical program and the clinical faculty are deemed as "essential" is to incorporate patient care, clinical education, and clinical faculty into the institutional mission statement. The most effective means to accomplish this is through active, collaborative participation in the process. Clinical faculty should strive to become a part of the infrastructure of a college and insure that clinical care and clinical education are duly recognized at all levels of an institution. This might include being involved in the formulation and periodic review of the institution's mission statement.

Clinical faculty can also contribute to their institution's faculty governance structure. This can be accomplished in a variety of ways: by serving on and chairing committees, by contributing to faculty meetings, by attending commencement ceremonies, and by participating in any other functions where faculty have institutional responsibilities. In order for clinical faculty to be viewed as an essential element within an institution, they really need to take a leadership role and act in an "essential" fashion.

It is through these efforts, along with demonstrating excellence in patient care and teaching, that clinical faculty will begin to have a long lasting and positive impact on an institution. Consider this question: if a board of trustees does not know the faculty and what they contribute to their institution, how can the board be expected to understand why they should grant tenure to a specific group (or individual member) of the faculty?

What are the responsibilities of the administration to clinical faculty?

The clinical faculty are not alone in the process of developing an essential presence at an institution. Institutions should provide faculty with the tools necessary for a successful career in academia, perhaps even as part of the employment contract. Specifically, administration could support faculty by offering consistent opportunities for faculty development, growth, and participation at all levels within the institution

Certainly career guidance is a critical component for a tenure track faculty member. A formal, institutionally sanctioned process for guiding and assisting clinical faculty in career growth and development is the ideal system to have in place. Senior faculty have much to offer their junior colleagues, including how they were able to successfully navigate the system of promotion and tenure. Career guidance can also help focus and direct faculty efforts in making major scholarly contributions and aid in the development of the socalled "national reputation," an important, if not essential, credential to demonstrate in most tenure reviews. If an institution does not have a mentoring system in place, then clinical faculty may wish to use this situation as an opportunity to work with the administration to create one.

As part of the career guidance process, clinical faculty also need to be aware of their responsibility to provide professional service. However, because of heavy clinical care and clinical teaching loads, some clinical faculty may find it more difficult to access their institution's development opportunities. This is where the administration can serve an advocacy role, whether it is through a clinic director, department chair, or dean to

Table 1 Critical Points Relating to Tenure for Clinical Faculty

Clinical faculty should recognize that qualifying for tenure is both an academic and organizational/political process

Clinical faculty should be encouraged to demonstrate their value and institutional worth

Clinical faculty should view themselves as essential to their institution Life-long career clinical educators can advance an institutional mission

Table 2 Administrative Support for Clinical Faculty

Career guidance
Faculty development
Participation in the formulation of work plans
Creating opportunity where none exists
Documenting excessive work loads
Facilitating the development of guidelines that recognize the essential nature of clinical faculty to the institutional mission

Table 3 Responsibilities of Clinical Faculty

Clinical excellence
Clinical teaching
Institutional and professional service
Scholarly contributions

Table 4 Scholarship Categories for Clinical Faculty*

Application Teaching Integration Discovery

*Adapted from Jacobs

provide faculty with release time to improve various skills through the creation of appropriate faculty work load assignments.

Whenever possible the development of work plans and work loads should be a joint venture between clinical faculty and the administration. Clinical faculty will likely have a better ability to help define a realistic work load because of their intimate knowledge of the time required to provide thorough patient care and high quality clinical education. If clinical faculty, in conjunction with the administration, are proactive in the process of designing work loads, then adequate development time should become a part of the normal faculty work plan.

If, for whatever reasons, administratively sanctioned opportunities for professional development are not available to faculty, then tenure track career faculty may wish to create opportunities for themselves. For example, faculty could pool time and/or resources by collaborating on clinical studies, coauthoring manuscripts, or covering clinical sessions for one another to maximize the time for professional

development.

Should development efforts fail, or if a faculty member's work load is excessive and cannot be changed, faculty should discuss the problem with administration. The administration should especially support those faculty who have made genuine efforts at development, but have had limited success. At a minimum, a written comment could be placed in the faculty file describing the efforts made and the lack of opportunity. Faculty should not be penalized for having a heavy patient care or clinical teaching assignment. If excellence in patient care and clinical teaching were recognized as essential to an institution, then heavier work loads in these areas could be viewed as excellent contributions in the tenure process.

What are the responsibilities of clinical faculty to the institution?

Excellence in teaching, service, scholarship, and national recognition are common elements in any tenure review. For clinical faculty,

an additional credential, clinical excellence, could and probably should also be assessed

Hekelman and Blase describe clinical teaching as the core of the mission of medical schools and teaching hospitals. They also discuss the need for an institution's commitment and support of its faculty in order to foster excellence in teaching. Yet clinical teaching is often given a lower priority in tenure reviews. For example, when Batshaw et al surveyed both clinical faculty and department chairs at the Johns Hopkins Medical School about criteria for tenure, teaching was rated lower than the number of publications, quality of research, and grant support by both groups. Thus, even before a school can evaluate a clinician's teaching expertise in a tenure review, the institution must first decide the relative value of excellence in teaching to the granting of tenure. If an institution accepts teaching as essential to its mission, then it is the responsibility of the faculty to teach their students, residents, and colleagues to a level that has excellence as its only goal. Each school or college of optometry will have its own unique way of assessing clinical teaching. Clinical faculty should be cognizant of the institutional policies used to assess teaching and strive to attain them.

Institutional and professional service are also important to tenure reviews, as they provide evidence that a candidate is multifaceted and can significantly contribute to the advancement of an institution and profession. Service also enables faculty to network with colleagues, gaining invitations to represent their institution at national and international venues. These activities will form a natural link to the development of a national reputation, which is a valuable credential to demonstrate to most tenure review committees.

Research and other scholarly endeavors comprise yet another essential aspect of faculty responsibilities. Contributing to the body of knowledge within a profession distinguishes faculty and supports the notion that they are indeed deserving of advancement, including promotion to higher ranks and

the award of tenure. What is an "acceptable" level of scholarship for a clinician, and how can the administration support faculty in their scholarly pursuits?

Jacobs states that "Diversity among a university faculty should be encouraged. We should not insist on identical activities and accomplishments for all faculty." This statement serves to underscore another exciting concept introduced by medical schools, an expanded view of scholarship for the clinician. Medical schools have broadened their definitions of scholarship for clinicians to include scholarship categories described by Jacobs and modified by the author as:

1. The scholarship of application: the application of clinical knowledge to problem-solving, or quite simply the scientific practice of a given discipline. This is where assessing clinical excellence as a credential in the promotion and tenure process could be helpful to clinical faculty.

2. The scholarship of teaching: assessing how students are taught, in particular the art of teaching clinical analysis and critical thinking. Other examples in this category include the development of new clinical programs or courses, or new clinical education software.

3. The scholarship of integration: the publication of a literature review which examines connections across disciplines or adds insight to previously published works, chapters in textbooks, or even the publication of extensive analytical clinical reports.

4. The scholarship of discovery: the more traditional type of research. Examples that may be suitable for clinical faculty include research in clinical education, epidemiology, health services, or resource utilization.

These forms of scholarship are familiar to the clinician. These types of studies are what many clinicians read to expand their knowledge base. These are the types of papers that many clinicians publish, and therefore these are the types of scholarship that should be a part of a clinician's credentials for promotion and tenure.

Optometric institutions should rethink the definition of scholar-ship to develop one more in sync with a faculty's actual job responsibilities, particularly clinical faculty. If optometric institutions hope to attract and retain talented clinicians as life-long and committed members of their faculty, then taking a fresh look at faculty appointments and how scholarship relates to those appointments is appropriate.

Finally, clinical faculty are responsible for the demonstration of clinical excellence, for without it teaching, leadership, and the dissemination of knowledge cannot be legitimized. Carey et al describe how the University of Virginia School of Medicine assessed clinical excellence as a faculty credential. Both objective and subjective data were utilized. They comment that their system for assessing clinical excellence has been accepted by faculty, department chairs, and their committee on promotion and tenure. Since optometric clinical faculty are teaching students how to become effective doctors of optometry, it would only make sense to assess the quality and excellence of care that is provided to patients by faculty. This assessment should be a vital part of the promotion and tenure process.

Conclusion

Tenure reform in academia is a dynamic process. While some schools routinely grant tenure to all faculty, clinical faculty are not consistently offered tenure track appointments. Over the past decade, numerous medical schools have modified tenure eligibility requirements to include clinical faculty. Clinical faculty contribute unique and essential goals to the schools and colleges of optometry. To assure that these contributions are a recognized part of an institution's mission, the clinical faculty, along with a supportive administration, will need to join together to create a cultural shift in institutional thinking about clinical teaching and clinical care. However, tenure eligible clinical faculty should also recognize that a life-long commitment from an institution will be difficult to attain without providing an institution with concrete reasons for granting it.

The critical nature of attracting and retaining exceptional clinical faculty through offering tenure eligible appointments cannot be overlooked within optometric education. Changing institutional thinking about the value of a tenured clinical faculty will require leadership and participation by all members of an institution. Finally, criteria for successful tenure for faculty whose primary responsibilities include clinical education need to be well delineated and defined.

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RESOURCES

Laser Surgery of the Posterior Segment, Second Edition.

Steven Bloom and Alexander J. Brucker, Lippincott-Raven, 1997,

414 pp. \$98.00.

A practicing optometrist, or educator for that matter, may easily overlook a book with this title. Aside from respecting the authors, this reviewer may have had little interest in cracking the cover, as well. What a reward to do so!

Each chapter begins with an outline, allowing the reader to scan for highlights or proceed to a specific section. The contents of the photocoagulation part are logically arranged from diabetic retinopathy through miscellaneous disorders. And while the text is instructive and the fundus photographs are graphic in their before-and-after presentations, the real interest to the clinician is in the diagnostic features of each disorder discussed. Diagrams showing diabetic macular edema and macular thickening are wonderfully educational, for example. Clear indications for specific photocoagulation treatments are developed. In many cases, there are complementary drawings showing the target of photocoagulation treatment.

Reviewer: Dr. Leo Semes University of Alabama at Birmingham

Contact Lenses: Treatment Options for Ocular Disease.

M. G. Harris, Ed., St. Louis, Mosby-Yearbook, 1996, 189 pages, index, paperback, black & white photographs, \$34.95.

The title of this book and the list of distinguished contributing authors promise interesting reading and much practical information for the contact lens specialist. Dr. Harris prefaces the book by stating that he has learned much from each of the authors, as I did. However, the book's contents

turned out to be a bit different than I had anticipated. Instead of information on how to fit contact lenses to patients with ocular surface diseases, such a keratoconjunctivitis sicca or keratoconus, the book contains seven chapters on how to manage contact lens-induced complications. This information is indeed crucial to any contact lens practitioner, but it was not what immediately came to mind when I read the title.

That aside, the book is very good. The first three chapters are excellent reviews of contact lensinduced complications that can be thought of as clinical synopses of the information found in larger texts. Chapter 3, in particular, was well-written in an easy to read format of soft lens extended wearinduced complications. This is a chapter I could quickly refer back to when a patient walks into the office with extended wear problems. In contrast, Chapter 4, though a good review of the research on rigid lens extended wear, made it difficult to extract patient management information without in-depth reading.

Chapter 5 was the only chapter that met my expectations for treating ocular disease. Zisman and Harris describe the theory and practical use of therapeutically tinted lenses to treat a variety of conditions, including color deficiencies and albinism. I found this to be extremely enlightening, and more chapters like this would have had me raving the virtues of this book to everyone I met.

As a volume of the Optometric Problem Solving Series, I look to this type of book as a reference tool to help me manage those difficult patients. In order for the book to be effective in this role, it must be formatted such that topics are easy to find and management strategies simply yet comprehensively laid out. Some of the chapters are presented just so, but because each

chapter was written by a different author, their formats vary widely. In its final form, this is a very good, informative, concise reference book for contact lens related complications. It will be a useful adjunct to any contact lens practitioner's library.

Reviewer: Dr. Ronald K. Watanabe The New England College of Optometry

Self-Esteem and Adjusting With Blindness. D.W. Tuttle, N. R. Tuttle, Springfield, Illinois, Charles C. Thomas, 1996, 286 pages, index, hardbound \$54.95 (paperback, \$37.95).

As the general population lives longer and thus the number of people with age related vision impairment increases, the availability of a comprehensive textbook on the subject of adjustment to vision impairment (from the historical, legal, and emotional perspective) takes on greater and greater importance. As visually challenged individuals under the age of 40 continue to be integrated into mainstream public educational settings as well as the workplace, teachers, employers, counselors, human resource professionals, employment recruiters, as well as family members and friends of visually challenged individuals would be well served to read this textbook. But most of all, the individuals cited in this text cry out to the doctors; to listen to, communicate with, and empower their visually challenged patients.

The text is divided into three sections. The first section offers the reader an important overview of blindness, a discussion of the impact of blindness on the quality of life, and a thorough discussion of the psychosocial implications of blindness for the individual so affected, family, and society. The second section of the text is a com-

prehensive review of the development of self-esteem for all human beings both internally and externally and serves to reinforce the fact that concepts of self esteem are equally relevant for all individuals and these concepts need applications, development and reinforcement in visually challenged people in the same way they do with all people. Section three covers the process of adjustment to blindness and vision impairment in greater depth than most texts on vision impairment. The personal quotations in this text by partially sighted as well as completely blind individuals are insightful and important for the reader. These quotations are neither self-congratulatory nor patronizing, but offer very important life influencing experiences in the areas of social interaction, education, workplace and intimacy. Inclusion of a text on this subject material should be part of the required subject matter in curricula in vision care, rehabilitation, education, and nursing. It should be recommended by these professionals to the friends and family of anyone having to adjust to vision impairment or grow up with vision impairment and integrate into the larger society.

Reviewer: Dr. Louis A. Frank North Shore Eye Specialists Danvers, MA

Pocket Companion - Clinical Ocular Pharmacology, Third Edition. J. Bartlett, S. Jaanus, Ross, Boston: Butterworth-Heineman, 1997, 512 pp, \$40.

The pocket companion to Clinical Ocular Pharmacology (third edition) is a convenient and handy overview of commonly presented conditions seen by primary care practitioners, along with the practical treatment and management of these problems. Fondly referred to as "Baby Bartlett and Jaanus," (and this term is even acknowledged in the preface of the third edition), the pocket companion provides citations to more detailed information in the larger book itself; the advantage to the "baby" volume is that the more theoretical and background information is omitted, so

the book is truly a light, easily carried resource of practical, commonly used information.

The chapters in the pocket companion provide useful guidelines and summaries on clinical topics, with succinct recommendations that assist in diagnosis and management. Brief chapters on massive topics such as retinal disease, neuro-ophthalmic disorders, corneal problems, and medical management of the glaucomas are welcome reviews in such an easily accessible handbook.

As in the "Big Bartlett and Jaanus," tables and figures are extremely helpful in presenting information. The reader is reminded in the preface of the companion edition that for more detailed information one should refer back to the larger volume. The pocket companion, however, easily fulfills its goal and namesake in being a quick and handy source of practical information that is easy to store in the clinic jacket pocket.

I recommend this book to practicing optometrists, as well as to students. Students may find the pocket volume especially helpful when used as a companion to the larger book, because it helps emphasize and distinguish the information which is most clinically useful. An analysis of this book, and its larger precursor, shows why they are, and continue to be, standard resources within the field of vision care.

Reviewer: Dr. Ellen Richter Ettinger State University of New York State College of Optometry

The Dictionary of Visual Science. Cline, Hofstetter and Griffin, Boston: Butterworth-Heineman, 1996, 820 pp, \$65.00.

The Dictionary of Visual Science is an impressive volume of terminology related to vision science and examination of the eyes. In judging a dictionary of visual science, criteria that I find useful include: (1) whether the definitions are correct; (2) whether the definitions are manageable and concise, so you can get the context with a brief reading; (3) whether the terms are

easy to find in the dictionary; and (4) whether the scope of the words included is broad enough to be useful to potential readers.

On all these counts, the Dictionary of Visual Science comes through brilliantly. The definitions are accurate and to the point. In fact, the preface explains that emphasis throughout the book is "placed on succinct definition, rather than on encyclopedic elaboration." This is refreshing, since it is usually preferable when going to a dictionary to get a brief understanding, rather than an exhaustive treatise that would take a long time to read and comprehend. The terms are easy to find, and the scope of terms is extensive across fields including ocular anatomy, ocular physiology, ocular pathology, neuro-ophthalmology, ocular genetics, ophthalmic optics, geometric optics, etc. Given the extent of terms, it is surprising how easy it is to locate entries.

In addition to concise definitions, some diagrams and figures are presented to enhance the explanation. These are simple and easy to follow.

I think the *Dictionary of Visual Science* would be helpful to practicing optometrists, students, and vision researchers, and I recommend it as a useful resource.

Reviewer: Dr. Ellen Richter Ettinger State University of New York State College of Optometry

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