

The Journal of the Association of Schools and Colleges of Optometry

OPTOMETRIC EDUCATION

Volume 19, Number 3



Spring 1994

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**VOL. 19
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CONTENTS

**SPRING
1994**

The Journal of the Association of Schools and Colleges of Optometry

SPECIAL FEATURE

The National Eye Institute—A Celebration of Vision Research

Patricia Coe O'Rourke, M.A.

The achievements of NEI-sponsored research during the past 25 years and the outlook for future funding are discussed.

76

COMMUNICATIONS

International Association of Boards of Examiners in Optometry—75 years of Optometric History

Mary L. Freitag, O.D., and Donald R. Gordon, O.D.

73

Fostering a Healthy Research Environment—A Blueprint for the Optometric Educational Institution

Felix M. Barker, II, O.D., M.S.

84

ARTICLES

Utilizing the Patient Management Problem as a Student Clinical Evaluation Tool

Lee Ann Remington, O.D., M.S., and John R. Roggenkamp, O.D.

A study at the Pacific University College of Optometry reports on the success in using the PMP in the evaluation of clinical competency during the third year of optometry school.

86

DEPARTMENTS

Guest Editorial: A Time for Reckoning and a Time for Celebration

Bradford W. Wild, O.D., Ph.D., and
Arthur J. Afanador, O.D., Ph.D.

70

Industry News

75

Abstracts

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

95

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John C. Whitener, O.D., M.P.H., p. 76 & 78



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OPTOMETRIC EDUCATION is published by the Association of Schools and Colleges of Optometry (ASCO). Managing Editor: Patricia Coe O'Rourke. Art Director: Dan Hildt. Graphics in General. Business and editorial offices are located at 6110 Executive Boulevard, Suite 690, Rockville, MD 20852 (301) 231-5944. Subscriptions: JOE is published quarterly and distributed at no charge to dues-paying members of ASCO. Individual subscriptions are available at \$20.00 per year, \$25.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Rockville, MD. Copyright ©1993 by The Association of Schools and Colleges of Optometry. Advertising rates are available upon request. OPTOMETRIC EDUCATION disclaims responsibility for opinions expressed by the authors. Article copies, 16mm microfilm, 35mm microfilm and 105mm microfiche are available through University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

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EDITORIAL

A Time for Reckoning and a Time for Celebration

Bradford W. Wild, O.D., Ph.D.

Arthur J. Afanador, O.D., Ph.D.

The readers of ASCO's journal, *Optometric Education*, are already aware that this year is the silver anniversary of the National Eye Institute. As one of the Institutes that comprise the National Institutes of Health, it is the one that is most familiar to optometrists and optometric educators. It is the major provider of basic and clinical research grant support in the United States. Although 25 years is still a relatively short time, it is long enough to provide a track record on which to judge NEI's accomplishments.

The purpose of the NEI is to conduct and support research and training related to blinding eye diseases and visual disorders, training in special health problems and needs of the blind, and research training in the basic and clinical sciences relating to sight and its preservation.

The aims of the NEI as outlined in this statement of purpose are as valid and as meaningful today as they were when President Lyndon Johnson signed the original legislation into law in 1968. Although many of the problems that confronted eye care professionals in 1968 are still with us today, there is no doubt that great strides have been made

in our understanding and treatment of many of these disorders. The treatment of serious retinopathy, glaucoma, and cataracts immediately come to mind as being noteworthy success stories. It is especially heartening that these serious eye conditions are becoming more amenable to treatment since they are particularly serious for the fast growing older patient population. In other words, the NEI can be said to have been responsive to the needs of the citizenry during its still relatively brief existence. There is cause for celebration.

On the other hand, we need to look to the future as part of our reckoning. How could the NEI be even more effective in its next 25 years? We in optometry could be more involved participants in this effort than we have in the past. Our professional interests have grown significantly and our educational programs have been tailored to meet our increased responsibilities. The challenge for optometry is to become more dedicated to meeting the national needs as specified in the goals of the NEI and to do this within the framework of the Institute. Each of the schools and colleges of optometry should address the needs as it perceives them and

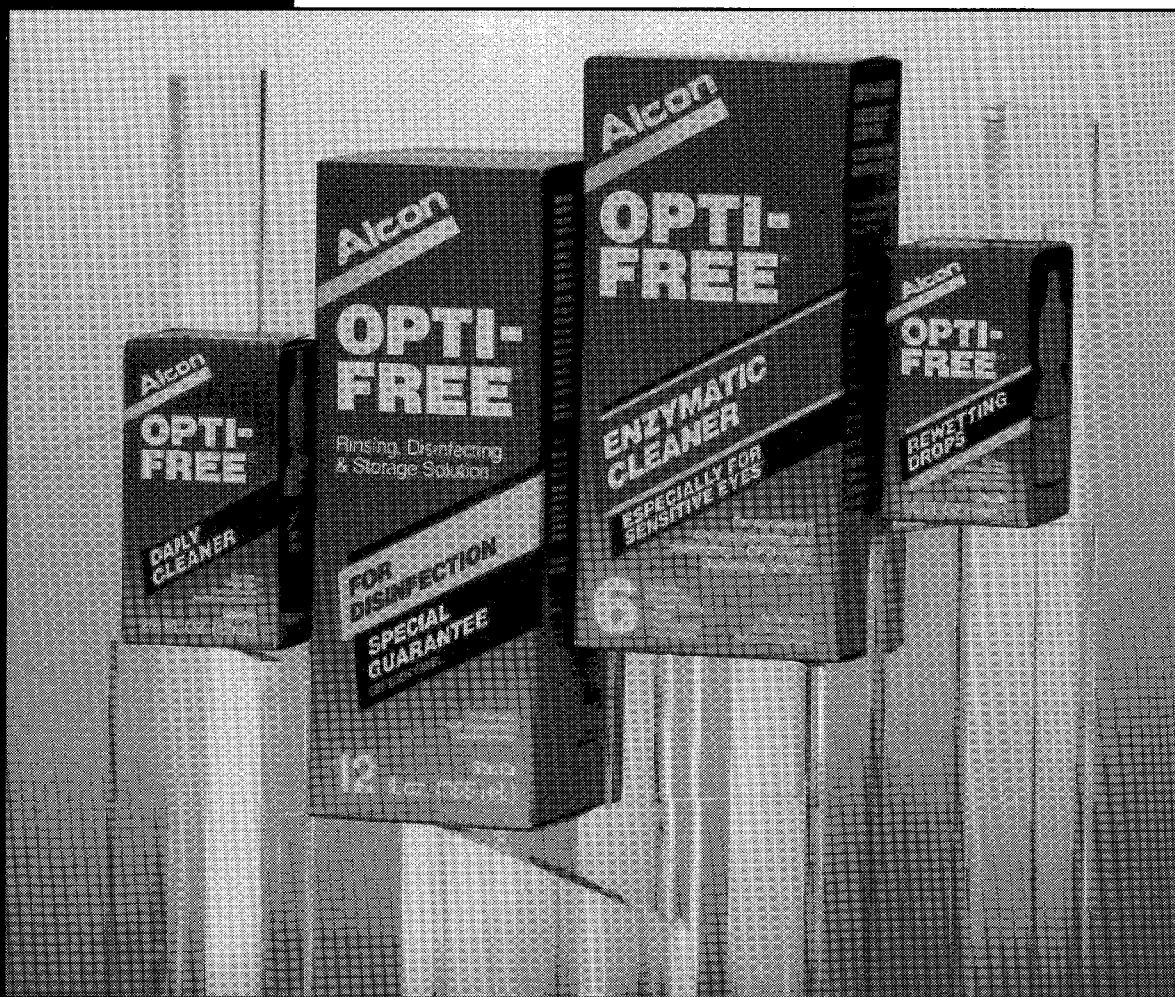
attempt to respond to those needs by writing appropriate grant proposals.

We have relied on others even though we are the best educated and best trained individuals to address certain of these issues. Contact lenses, low vision, vision training, aniseikonia, and more recently, environmental and public health, including preventive eye care, are areas in which optometry can make significant contributions. The challenge in this reckoning is for optometry to become more involved in the activities of the National Eye Institute. Then, in the year 2018 when the NEI celebrates its golden anniversary, there will be even more reason for the nation and the profession of optometry to celebrate the accomplishments of this very worthwhile health agency. □

Dr. Wild recently retired as dean of the University of Alabama at Birmingham, School of Optometry. He is ASCO's immediate past president. Dr. Afanador is dean of the Inter American University of Puerto Rico, School of Optometry. He currently serves as ASCO president.

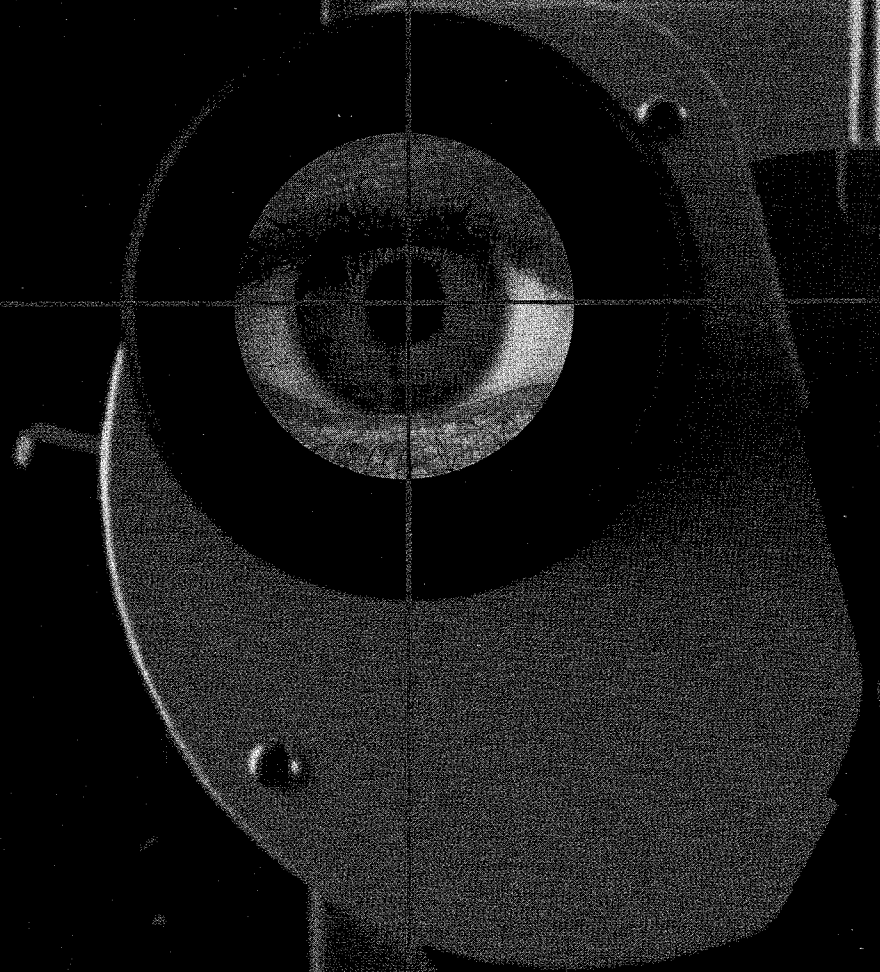
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International Association of Boards of Examiners in Optometry—75 Years of Optometric History

Mary L. Freitag, O.D.
Donald R. Gordon, O.D.

Nineteen ninety-four marks the 75th anniversary of the founding of the International Association of Boards of Examiners in Optometry (IAB). The IAB represents the regulatory and licensing aspects of the profession, as the IAB consists of member boards from U.S. states and territories and Canadian provinces. The purpose of these boards is to enforce the statutes of the jurisdictions in order to protect the public, the consumers of optometric services. Literally thousands of optometrists and public members have served on these licensing boards since their establishment. The individuals who have been involved with the IAB have provided great insight and leadership for optometry over the past 75 years. Much of the IAB history is preserved in the minutes of the organization, currently stored within the AOA library.

IAB in the Early Years

In 1919, W.S. Todd of Hartford, Connecticut, was elected to serve as the first president of the IAB when it met at the Seneca Hotel in Rochester, New York. The minutes of that first meeting are recorded on hotel stationery. They record that twenty-seven people, representing nineteen U.S. states and two Canadian provinces, met on July 22, 1919. These men agreed that there was sufficient need to form an organization like the IAB, with a Constitution and By-Laws, in order to conduct business among themselves on an ongoing basis. The initial membership dues for the IAB were \$1.00 per board. Oh that business could be conducted for that amount today!

Two significant resolutions passed at the initial meeting. The first was the recommendation that each board establish reciprocity throughout the

United States, Canada and Cuba. The major stumbling block, however, was establishing the educational requirements needed for reciprocity.

The second resolution resulted from a joint meeting of the IAB and the Faculty of the Optical Schools and Colleges. The resolution stipulated that each licensing jurisdiction establish, by law, the requirements that must be met in order to sit for examination for licensure. The resolution set the requirement of 1000 hours of attendance in no less than eight months at a recognized optometry school. The resolution went on to state that this requirement be increased to 2,000 hours as soon as possible.

As a resolution of the joint meeting, a recommendation was made to contact the AOA with the following proposal: "the AOA should provide suitable propaganda setting forth optometry as a profession to be disseminated through high schools and other channels by the educational department."

The impact of the first meeting and the resolutions carried over to later meetings of the IAB. The first conference to establish optometry standards was held in St. Louis, Missouri, January 13-14, 1922. An additional subject at this meeting was the desire to have the optometry boards involved in the licensing of automobile operators!

In an effort to establish a uniform educational experience, a syllabus was created which was sent to all educational institutions so that the curriculum would become more consistent. In 1922 it was recognized that the schools would need time to adapt to the syllabus and that the standards recommended be in place for at least five years to allow the schools to conform. The Committee on Text Books reported that it had spent considerable time in identifying books which are "either optometric in content, or

have an optometric slant throughout." The list of books numbered 109.

There was also discussion on a national standardized examination. The development of a data base of questions to be used in state and provincial examinations was a priority of the IAB.

Early Interactions Between the IAB and Optometric Education Programs

Over the next decade there was dialogue with the schools of optometry to encourage the development of good, sound programs. The 1924 minutes of the IAB encouraged the schools to maintain their two-year programs and not to seek more required time in school. Instead, the schools were advised to increase the quality of the courses. This is a common theme to this day, as both licensing boards and the schools and colleges grapple with the challenge of maintaining and increasing educational quality within reasonable time constraints.

The IAB has worked closely with the Council on Optometric Education since the 1920's. The idea of an organization independent of the IAB to evaluate the educational programs was encouraged from the inception of the COE. Because there are always times when total agreement is not possible, the IAB was not fully willing to hand over the credentialing of education to COE until well into the 1940's. The IAB, through its member boards, worked to change the state and provincial laws to reflect the sophistication of the profession in the 1930's and 1940's.

The idea of uniform examinations was an ongoing theme. In 1940 the Library of State Board Questions was established with the help of ASCO. Because there was no uniform exami-

nation, each state could use questions from the Library to formulate its examination. The cooperation of ASCO and the IAB in the arena of examination led to the 1949 resolution of the IAB to form the American National Optometry Board. The new board was composed of one IAB member, one AOA member and one ASCO member. The passing of the new examination was to meet the requirement of states having reciprocity laws. This is one of the biggest accomplishments for optometry in IAB history, and the result for the profession of optometry today can be seen in the quality of the examinations now developed and administered by the organization that is now called the National Board of Examiners in Optometry.

IAB's Present and Future

The dynamic profession of optometry is reflected in the IAB today as our

member boards work on the regulatory impact of an ever-expanding scope of practice for the profession. The IAB continues to monitor the educational institutions through its two representatives on the COE and through COE's annual reports, which are used to accredit the education of licensees in each jurisdiction.

Other projects of concern to the IAB in recent years involve the permanent maintenance of a data base of licensed practitioners in order that more accurate data on optometry can be maintained. This will ensure that our profession's demographics are accurately reflected in the scheme of health care providers and upcoming changes in health care delivery. The ongoing issues of education and continuing education are always on the IAB agenda.

The IAB has also focused on the issue of the continued competence of the practicing optometrists in each

jurisdiction, and methodologies that can adequately assess that competence.

To celebrate its past accomplishments and anticipate its bright future, the IAB will be holding a 75th anniversary luncheon on Wednesday, June 23, 1994, in Minneapolis. This will be on the first day of the Annual Meeting and all of our friends in optometry, our past IAB members and leaders, and our future optometrists are invited to join in this celebration of an organization that, from its inception, has been actively engaged in advancing the profession.

We hope to see you in Minneapolis!

Dr. Freilich and Condon are past presidents of the International Association of Boards of Examiners in Optometry.

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INDUSTRY NEWS

Companies appearing on these pages are members of ASCO's Sustaining Member Program. Sustaining Members are listed on the inside front cover of each issue. Membership is open to manufacturers and distributors of ophthalmic equipment and supplies and pharmaceutical companies.

Vistakon Promotes Walsh, Appoints New President

Johnson and Johnson has announced the promotion of Bernard W. Walsh to the position of company group chairman and worldwide franchise chairman for Johnson & Johnson Vision Products, Inc. Gary K. Kunkle has been appointed to succeed Walsh as president of Vistakon, a division of Johnson & Johnson Vision Products, Inc. The appointments were effective January 1, 1994.

In his new position, Walsh will continue to have global responsibilities for Vistakon and will assume broader responsibilities within Johnson & Johnson. In addition, he will be made a member of Johnson & Johnson's Professional Sector Operating Committee and will report to Robert E. Campbell, vice chairman of Johnson & Johnson and chairman of the Committee. Walsh will relocate to Johnson & Johnson's worldwide headquarters in New Brunswick, N.J.

Kunkle began his career with Johnson & Johnson in 1972 as a sales representative for Ethicon, Inc., a Johnson & Johnson company. After several positions of increasing responsibility with Ethicon, he joined the Orthopaedics Division of Johnson & Johnson Products as national sales manager, and was appointed vice president of sales and marketing when Johnson & Johnson Orthopaedics, Inc. was formed in 1987. In January 1992, he was named president of that company. As president of Vistakon, Kunkle will report to Walsh.

Varilux Supports Optometry Super Bowl

The Third Annual Optometry Super Bowl was held in Newport Beach, California, January 7, 1994,

during the American Optometric Student Association Conference. This year's quiz show format was changed to include questions not only from all areas of optometric curriculum, but also a "fun category of general trivia." The competition had one representative from each of the 19 schools and colleges of optometry in the United States and Canada. First prize was a grant of \$1,000.00, second prize, \$500.00, and third prize, \$250.00.

"This year's Optometry Super Bowl was geared toward education and fun. We included a 'fun category' for the students to make this event more light-hearted," said Danne Ventura and Dr. Rod Tahrán, coordinators of the event for Varilux Corporation.

Paragon Commits Technical Support to Practitioners

Paragon Vision Sciences has formed a nationwide team of technical representatives to support their laboratory and distributor customers in better representing Paragon lenses and solutions to eye care practitioners.

"Practitioners throughout the country have traditionally purchased Paragon products through our network of independent laboratories," said Adrian Lupien, vice president of sales for Paragon. "This new resource will build upon that tradition by serving both the practitioners and laboratories, providing in-depth training and technological updates directly to doctors from Paragon. The goal is to create a better informed customer base for Paragon's laboratories by supplying practitioners with continuing education about advances in the RGP industry."

The technical support team will

be launched and in service during the first quarter of 1994. For more information, call Paragon at 1-800-800-0369.

CIBA Vision Sponsors AOA/ASCO Conference

More than 90 leading optometric professionals and educators attended an American Optometric Association (AOA)/Association of Schools and Colleges of Optometry (ASCO) Summit on Optometric Education, thanks to a \$100,000 grant from CIBA Vision. The conference was held in August last year in Boston.

Members of the AOA, ASCO, and nine other rallied organizations attended the meeting, titled "Conference on Graduate education, Residencies and Fellowships," which was the sixth in a series of seven conferences.

"CIBA Vision is honored to sponsor worthwhile activities such as this landmark conference held by the AOA and ASCO," said Richard E. Weisbarth, O.D., F.A.A.O., executive director of professional services and customer satisfaction, CIBA Vision. "This grant is another example of our ongoing commitment to excellence in education."

Bausch & Lomb's Solution Maintains #1 Market Share

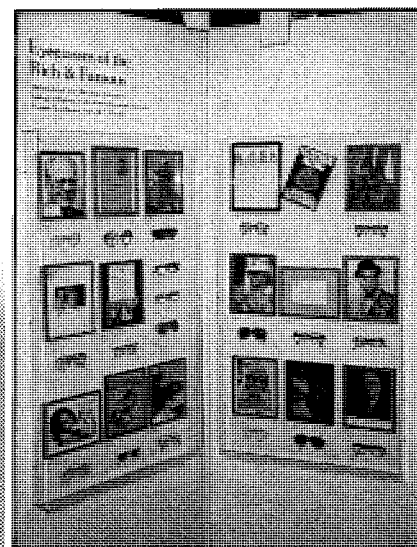
Bausch & Lomb's ReNu Multi-Purpose Solution continues to lead the competition as the most recommended lens care item in the United States according to the latest HPR (Health Products Research). Its share of patient starts has increased by more than ten share points over the past two years to become the number one professionally recommended lens care product (as measured by share of doctor recommendations).

(Continued on page 94)

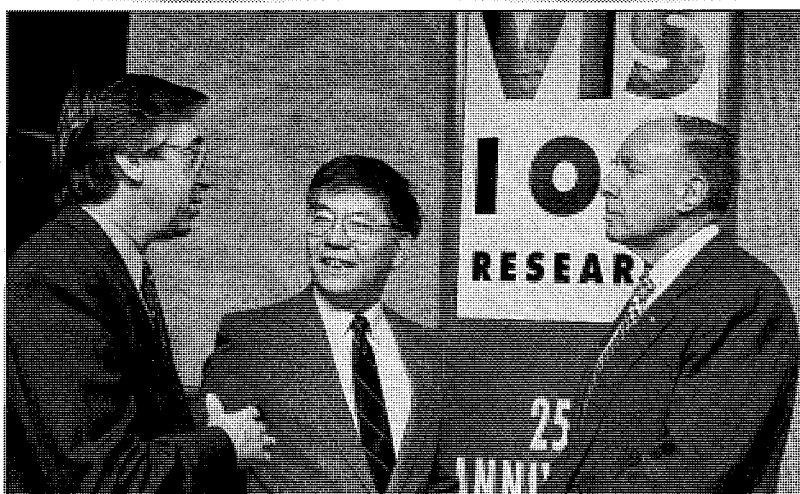


Dr. Karen De Valois, associate professor at the UCB School of Optometry, demonstrates aspects of color vision to students under the watchful eye of Dr. Carl Kupfer, NEI director.

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The traveling science exhibit features "Eyeglasses of the Rich and Famous."



UCB Optometry School Dean Anthony Adams welcomes UCB Chancellor Chang-Lin Tien and NEI Director Carl Kupfer to the UCB School of Optometry's "Vision Education Day."

The National Eye Institute— A Celebration of Vision Research

Patricia Coe O'Rourke, M.A.

Abstract

The 25th anniversary of the National Eye Institute offers an opportunity to examine the history of the federal role in eye and vision research. The achievements of NEI-sponsored research and the outlook for future funding are discussed.

Key Words: National Eye Institute, National Institutes of Health, National Advisory Eye Council, traveling science exhibit, Alliance for Eye and Vision Research

The National Eye Institute is celebrating 25 years of vision research. This signifies a quarter century of expanded public support for vision research — research that has resulted in dramatic advances against vision-impairing

diseases and in significant reductions in the nation's health care costs. But does the American public fully understand the importance of this research? In 1992, representatives from the vision community began meeting to address this question. They formed an organizing committee to plan a year-long celebration from 1993 through 1994.

The Committee includes representatives from leading academic institutions throughout the country, as well as from professional and voluntary organizations. Representing optometry on the organizing committee were the American Optometric Association, the American Academy of Optometry and the Association of Schools and Colleges of Optometry.

The goals of the celebration are:

- to present the American public a "stockholders' report" of their long-term investment in improved eye health;
- to highlight the achievements and the frontiers of vision research;

- to encourage support for future research; and
- to inspire America's young people to pursue careers in biomedical research.

Activities planned by the National Eye Institute for the nationwide celebration include a traveling science museum exhibit, a program for junior high school students that can be adapted for younger and older students, and a promotion program including a media kit customized for use in the community.

Also planned are community-based eye health education activities using materials from the new National Eye Health Education Program (NEHEP), a program that translates results of research into improvements in patient care. This program is coordinated by the National Eye Institute, in partnership with more than 40 private and public organizations (ASCO's liaison to NEHEP is Dr. Barry Barresi, vice-president and dean for academic affairs at the State College of Optometry, State University of New York).

The Traveling Science Exhibit

The 47-panel traveling science exhibit is an interactive, museum-quality exhibit that highlights two themes: (1) how the eye and brain interface to create vision and (2) how researchers are developing novel strategies to protect our eyesight from disease and developmental problems.

To illustrate these ideas, the exhibit features a number of "hands-on" activities that demonstrate how the eye focuses light, how we perceive motion and color, and how the brain processes visual information into a meaningful picture.

The traveling science exhibit, "Vision," features "Eyeglasses of the Rich and Famous" — an interesting display of eyeglasses worn by such luminaries as Elvis Presley, John Chancellor, George Bush and Miss Piggy — that is on loan from The Ohio State University College of Optometry. The exhibit also offers a display of artifacts, including antique eyeglasses and glass eyes that are on loan from the Foundation of the American Academy of Ophthalmology.

The exhibit began its journey in San Francisco at the Exploratorium where it was sponsored by the Smith-Kettlewell Eye Research Institute under the coordination of Ms. Ruth S. Poole. The exhibit was on display from October 26 through November 5, 1993. NEI's founding director, Dr. Carl

Kupfer, was on hand for the exhibit's unveiling.

"The human eye is one of the body's most amazing organs," said Dr. Alan B. Scott, director, Smith-Kettlewell Eye Research Institute. "This exhibit is great for kids from 8 to 80 or anyone interested in learning more about how we see. It presents complex ideas in very simple terms that will be accessible and fun for all."

Another facet of the celebration in the San Francisco Bay Area was the "Vision Education Day" sponsored by the University of California at Berkeley School of Optometry on October 26. Dr. Karla Zadnik coordinated the visit of nearly 600 fourth and fifth graders to the School of Optometry to learn about bovine eye dissection, corneal mapping, retinal photography, computer displays of optical illusions and simulations of what it's like to be partially sighted. The event was jointly "kicked off" by National Eye Institute Director, Dr. Carl Kupfer; UC Berkeley Chancellor, Dr. Chang-Lin Tien; and UC Berkeley School of Optometry Dean, Dr. Anthony Adams. Much of the research conducted at the School of Optometry is sponsored by the National Eye Institute, including studies of people without rod photoreceptors, the development of myopia, visual changes in diabetes and development of vision in babies.

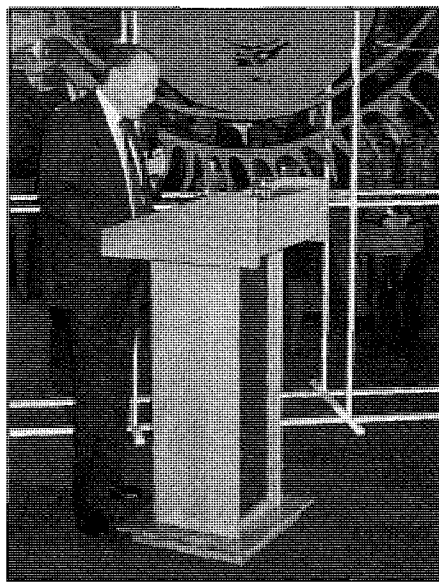
From California, the exhibit moved to Chicago where it was on display at the Museum of Science and Industry November 9-19. Its 1994 tour takes it to the Science Museum in Ft. Lauderdale, Florida (January 1-February 20); and to Union Station in Washington, D.C. (April 10-17). Other cities that have expressed interest in the exhibit are: Los Angeles, California; Portland, Oregon; Houston, Texas; Madison, Wisconsin; Ann Arbor, Michigan; Philadelphia, Pennsylvania; New Orleans, Louisiana; Boston, Massachusetts; Houston, Texas; Birmingham, Alabama; Atlanta, Georgia; Baltimore, Maryland; Rochester, New York; Milwaukee, Wisconsin; and St. Louis, Missouri.

History

The National Eye Institute (NEI) was created on August 16, 1968, when President Lyndon B. Johnson signed Public Law 489 of the 90th Congress. The charge of the new institute was to conduct and support research and training related to blinding eye diseases and visual disorders, training in special health problems and needs of the blind, and research and training in the basic

and clinical sciences relating to sight and its preservation.

The road leading to the formation of a governmental institute whose focus was the preservation of sight was, at times, a rocky one. Thirty-eight years earlier, in 1930, the National Institute of Health was formed, bringing the federal government into the realm of medical research. The first categorical institute, the National Cancer Institute, was created seven years later as a subdivision and became the prototype of the many national institutes to follow. In the late 1940s, other categorical institutes were created for the heart, for dental research, for mental health, for allergy and infectious diseases, and finally, in 1950, for neurologic diseases and blindness. And thus the National Institute of Health became the National Institutes of Health.



NEI Director Carl Kupfer delivers a statement at the unveiling of the traveling science exhibit.

The institutes were similar in that they had programs of intramural research projects, provided grants-in-aid to extramural research endeavors and established study sections that consisted of peers who assigned priority ratings to all projects. Each institute had a director and staff aided by a group of professional experts and interested lay persons in an advisory council.

The National Institute for Neurological Diseases and Blindness

By 1950 many felt that an institute focused on eye diseases was necessary in order to garner adequate support for research to prevent blindness. The

National Foundation for Eye Research, the Albert & Mary Lasker Foundation, and the National Council to Combat Blindness were involved in this struggle. Because five other institutes had already been created during 1945-1950, the administration believed the National Institutes of Health was becoming too fragmented, and it opposed the effort.

In a compromise between the House, which supported scientific research and professional training to combat blindness, and the Senate, which encouraged the efforts of voluntary health organizations concerned with neurologic disorders, the Omnibus Medical Research Act was passed in 1950, and the National Institute for Neurological Diseases and Blindness was created.

The number of extramural grants for eye research increased from nine in 1951 to 30 by 1952, but the intramural program for vision research grew more slowly. It was only after Dr. Ludwig von Sallmann, an expert in ocular physiology and pharmacology with over 35 years experience, was appointed chief of the ophthalmology branch of the institute, that the branch grew. By 1960, van Sallman increased his staff to 33, including six permanent research ophthalmologists. Still, the growth of intramural research did not match the increase in funding for outside research. The intramural share, in fact, dropped from one-third in fiscal 1955 to one-sixth by fiscal 1966.

The Campaign for a National Eye Institute

In the 1960s, the campaign to create a separate eye institute was more successful. Three leaders in the movement to create a national eye institute run by the federal government were ophthalmologists: Dr. Edward Maumenee, a prominent ophthalmologist at The Johns Hopkins University School of Medicine; Dr. Jules Stein, a nonpracticing ophthalmologist who had become a millionaire businessman; and Dr. Ralph Ryan, one of the first ophthalmologists hired by the National Institute of Neurological Diseases and Blindness who had since left the government for private practice.

At a February 1964 meeting in Chicago, Maumenee met with four ophthalmology department chairmen to discuss matters of professional concern. As the meeting continued, the feeling of the participants grew that the time had come for a separate institute, one in which ophthalmology would no

Advances in Eye Research Result in Savings

Cataracts - 1.5 million cataract operations are performed annually — costing \$5 billion. The number of operations is expected to increase to 2 million per year by the mid-1990s. If the rate of cataract development through research could be delayed by 10 years, approximately 50% of cataract operations would be avoided and \$2.5 billion would be saved annually.

Diabetes - the leading cause of blindness among working-age Americans - affects about 14 million, of whom 24,000 go blind every year. Currently recommended treatments including laser surgery and vitrectomy are so effective that affected individuals have a 95% chance of maintaining useful vision.

An NEI-sponsored Diabetic Retinopathy Study research trial - costing \$10.5 million - showed that timely laser treatment will save the Federal Government up to \$2.8 billion by the year 2000.

Only about 50-60% of eligible patients currently receive laser treatment, with Federal Government savings of more than \$100 million per year. A new NEI health education program is working to increase the percentage who are treated. By getting timely treatment for all patients, this program could save more than \$200 million per year.

Age-related Macular Degeneration (AMD) - AMD is the leading cause of blindness in Americans age 65 and older. The major goal of the NEI research on AMD is to prevent or delay the progression of the disease — if those who are blind from this disease could be reduced by only 50%, the cost to the Federal Government for payments to citizens could be reduced by \$250 million dollars per year.

longer be subordinate to neurology in the administration of government eye research.

The campaign was furthered when Stein contacted Representative John E. Fogarty, Senator Lister Hill and President Lyndon B. Johnson, a personal friend, about establishing a national eye institute. In 1965, S.3514 was introduced to establish a national eye institute; similar bills were filed in the House.

Government officials initially reacted with strong resistance; officials at the National Institutes of Health opposed the legislation. Dr. James A. Shannon, then director of the National Institutes of Health, thought that the underlying assumptions of proponents were "simply not sound," that the proposed solution was not the right one, and that "I mistrust the trend toward further fragmentation of NIH disease programs that might be touched off by approval in this instance."

Also speaking out against a separate institute was Dr. Richard Masland, then director of the National Institute of Neurological Diseases and Blindness, who recognized that problems existed in eye research, but recommended action to strengthen the existing program.

Shannon and Masland's efforts were successful and Congress took no action on S. 3514.

The situation changed, however, during the 90th Congress. Research to Prevent Blindness published results of a national survey it had funded on the status of eye research at American medical institutions. The organization also hired the American Institute of Public Opinion to conduct a poll on public attitudes toward vision. Both the book and the poll supplied national eye institute proponents with the information needed to persuade Congress to enact legislation.

On January 16, 1967, Senator Hill and 50 cosponsors introduced legislation to set up a separate eye research institute; 38 bills were introduced in the House for the same purpose. The House Subcommittee on Public Health and Welfare of the Committee on Interstate and Foreign Commerce held two days of hearings on the legislation, on October 31 and November 1, 1967.

Twenty-nine people testified before the subcommittee, most of whom supported a separate federal eye research institute. Officials of the federal government again opposed the legislation. John W. Gardner, Secretary of Health, Education and Welfare, argued against enactment on the grounds that a separate institute "would lead to a very unprofitable fractionation of effort, a lack of collaboration in research and problems in the administrative management of research."

Dr. William H. Stewart, the Surgeon General, supported Gardner's views. He said that a new, separate institute "is at best unlikely to have a significant strengthening effect on eye research."

Enthusiastic support for the separate institute came from those speaking for ophthalmologists and voluntary associations concerned with the visually impaired.

Testifying on behalf on optometry was Dr. V. Eugene McCrary, director, Department of National Affairs of the American Optometric Association. Dr. McCrary said, "We do not feel strongly 'for' or 'against' the establishment of a National Eye Institute within the NIH complex. We do oppose enactment of this legislation in its present form because it does not specifically state that optometrists and their services must be an integral part of the Institute if such an Institute is indeed to be established."

Dr. McCrary continued, "We have documented a long series of discriminatory practices against optometry by various government agencies. It is against this background of discrimination and in this context that we feel optometry and optometric services should be specified in the statutory language of the bill." Dr. McCrary then called the attention of the Subcommittee members to an attachment titled "Discrimination Against Optometrists in the Federal Service."

Dr. McCrary submitted for inclusion in the record of the hearings statements from Dr. Spurgeon Eure, president of the Southern College of Optometry and chairman of the Advisory Research Council of the American Optometric

Foundation; from Dr. Gordon G. Heath, professor of optometry at the Indiana University Division of Optometry; and from Dr. William Baldwin, dean of the College of Optometry at Pacific University and chairman of the American Optometric Association's Committee on Research.

In his written text, Dr. Baldwin said "... the capability of inter-disciplinary and broad spectrum vision research is growing. The Committee (American Optometric Association Committee on Research) strongly feels that the best

interests of visual science and of the public will best be served by the establishment of the National Eye Institute only if all the academic and professional disciplines which have developed competence and interest in vision research are permitted and encouraged to work within the framework of one organization. We can think of no rationale which would justify limiting research administered or sponsored by the National Eye Institute to studies of disease processes; nor can we think of any reasonable justification

for excluding optometric participation, particularly since the research capability that is developing under the aegis of optometry is expanding dramatically."

Again the bill might have died except for the work of Dr. Ryan who organized Lions Clubs across the nation to send 100,000 telegrams and letters to Congress to bring the legislation to the floor of the House for a vote.

On July 2, 1968, H.R. 12832, the eye institute bill, received a unanimous favorable report from the Committee.

Resolution **The National Advisory Eye Council** **Adopted June 30, 1993**

The Role of Clinical Research in Containing Health Care Costs

The development and testing of medical treatments and diagnostic measures need to be supported in order for medicine to advance and for a comprehensive, universal health care program to provide the best care possible to the American population. Innovative and developmental ideas for clinical research must be widely supported by the National Institutes of Health and the most promising of these incorporated into well-designed clinical trials.

The history of American medicine includes numerous examples of harm and waste resulting from widespread adoption of inappropriate therapies based on uncontrolled and biased observations. This source of waste is eliminated when decisions are based upon reliable scientific evidence. The National Eye Institute-supported clinical trials in diabetic retinopathy resulted in cost savings both by identifying a treatment which markedly reduces a visual disability from that condition and by determining the stage of the disease at which treatment becomes appropriate. Enough public dollars are saved each year as a result of these findings to pay many times over the cost of treatment as well as the cost of conducting the trial.

Uncontrollable and often unobservable factors influence the outcome of any treatment, including the physician's belief in the therapy, the severity of the illness and the patient's age, condition, attitude, and lifestyle. When these same factors determine which therapy is selected, objective comparison of outcomes becomes impossible. The best control of bias and error is accomplished by well-planned randomized clinical trials (RCTs). A national health care program provides an opportunity to develop new paradigms for increasingly cost-effective RCTs integrated into the delivery of clinical care. To foster innovation, reimbursement for studies of clinical interventions that are classified as experimental should be provided, including the cost of the intervention, as part of the national health care program. It would be cost effective and in the best interest of the public to pay for new unvalidated interventions **when done as part of a randomized comparison.**

Health services research, such as clinical outcomes research, should be appropriately utilized to evaluate quality and to study the implementation of new clinical interventions after they have been rigorously tested in a controlled, randomized clinical trial. Observational studies, including those using large available data sets such as claims data, should not be considered as substitutes for careful clinical trials.

Thus be it resolved, that the National Advisory Eye Council recommends the inclusion of cost-effective and carefully controlled randomized clinical trials as one of the cornerstones of a national health care program since this would help to provide the best possible care to the American people.

The committee accepted claims of the bill's proponents and said that an ophthalmologist should head the National Eye Institute. Acknowledging the testimony of the optometrists, the committee report also stated that the advisory council to the new institute should be composed exclusively of "eye men in both civilian and medical areas," and that the institute should support physiologic optics.

In the following two months, government opposition crumbled and the 90th Congress finally passed Public Law 489. The legislation charged the Secretary of Health, Education and Welfare with establishing the National Eye Institute to conduct and support research and training related to blinding eye diseases and visual disorders; training in special health problems and needs of the blind; and research and training in the basic and clinical

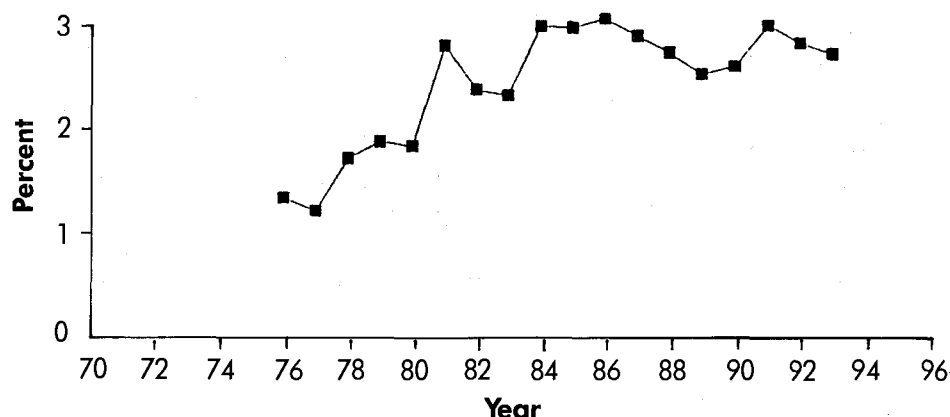


FIGURE 1
Percent of NEI Funds to Optometry Schools & Colleges

TABLE 1
National Advisory Eye Council
Optometric Members and Terms of Service

Meredith W. Morgan, O.D., Ph.D.	2/17/69	9/30/70
Glenn A. Fry, Ph.D.	3/01/69	9/30/73
C. Clayton Powell, O.D.	12/04/71	9/30/75
Jay M. Enoch, O.D., Ph.D.	2/25/75	9/30/76
Tony Q. Chan, O.D.	10/28/75	10/31/79
Gordon G. Heath, O.D., Ph.D.	1/21/77	10/31/80
Jerry L. Christensen, O.D., Ph.D.	1/24/77	10/31/80
Jay M. Enoch, O.D., Ph.D.	12/20/80	10/31/84
Richard M. Hill, O.D., Ph.D.	11/01/82	2/28/87
Arthur Jampolsky, O.D., M.D.	1/31/84	10/31/87
Kenneth A. Polse, O.D., Ph.D.	1/12/87	10/31/90
Melvin D. Shipp, O.D., M.P.H.	1/10/89	2/28/93
Lynn Cyert, O.D., Ph.D.	4/24/92	11/30/95
Joseph P. Shovlin, O.D.	11/30/92	11/30/96

From an initial appropriation of \$24 million in 1968, the NEI's budget today totals more than \$275 million to support approximately 1,500 research projects.

sciences relating to sight and its preservation. President Johnson signed the National Eye Institute legislation on August 16, 1968.

The Early Years

In January 1970, Dr. Carl Kupfer was appointed Director of the National Eye Institute. As its first and only director, Dr. Kupfer has guided the institute, encouraged its growth, and supported substantive eye research.

Dr. Kupfer made a number of organizational changes to reflect advances in scientific research. In his first year, he reorganized the institute to form an office of biometry and epidemiology, an office of the director of intramural research, a laboratory of vision research and a clinical branch. He established the office of the Associate Director of

Extramural and Collaborative Programs to administer extramural programs. He set up four sections within the laboratory of vision research on biochemistry, experimental embryology, experimental pathology and physiology.

The Eye Institute's advisory council set up a subcommittee to define research and in 1974 began developing the first comprehensive vision research and training program in the United States.

The Eye Institute has two categories of advisory bodies. The first is made up of biomedical investigators with expertise in specific scientific disciplines or medical specialty areas. The focus of these committees is to determine the merit of research grant applications,

cooperative agreements and contract proposals. Examples are the Board of Scientific Counselors, which offers advice on the intramural program; the Vision Research Review Committees, which review fellowships, centers, contracts, and cooperative proposals; and the Visual Sciences Study Sections, which are formed by the Division of Research Grants to review research grant applications.

A second category of advisory committee, the National Advisory Eye Council, provides a broad perspective on social needs and national priorities. It is composed of biomedical scientists, and leaders in education, social science, law, and public health. A number of optometrists have served on the Coun-

TABLE 2
National Advisory Eye Council
Carl Kupfer, M.D., Chair

Burnside, Mary Beth, Ph.D. (11/30/93)*
 Professor
 Department of Molecular and Cell Biology
 University of California-Berkeley
 Berkeley, CA 94720

Cyert, Lynn, O.D., Ph.D. (11/30/95)
 Professor of Optometry
 College of Optometry
 Northeastern State University
 Tahlequah, OK 74464

Felix, Jeanette S., Ph.D. (11/30/96)
 Director of Science
 National RP Foundation, Inc.
 Baltimore, MD 21217

Guyton, David L., M.D. (11/30/95)
 Professor
 Department of Ophthalmology
 Wilmer Eye Institute
 Johns Hopkins Hospital
 Baltimore, MD 21287-9009

Hillis, Argye, Ph.D. (11/30/94)
 Associate Professor, Statistics
 Texas A & M College of Medicine
 Scott and White Hospital/Foundation
 Temple, TX 76508

Holmes, Sadako S. (11/30/95)
 Executive Director
 National Black Nurses Association
 Washington, D.C. 20001

Horwitz, Joseph, Ph.D. (11/30/94)
 Professor
 Department of Ophthalmology
 UCLA School of Medicine
 Jules Stein Eye Institute
 Los Angeles, CA 90024-1771

Kaufman, Herbert, M.D. (11/30/96)
 Boyd Professor
 Department of Ophthalmology
 LSU Medical Center
 New Orleans, LA 70112

Kaufman, Paul L., M.D. (11/30/94)
 Professor
 Department of Ophthalmology
 University of Wisconsin Medical School
 Madison, WI 53792

Shovlin, Joseph P., O.D. (11/30/96)
 Clinical Associate
 Northeastern Eye Institute
 Scranton, PA 18503

Ex Officio Members

Shalala, Donna E.
 Secretary
 Department of Health and Human Services
 Washington, D.C. 20201

Varmus, Harold, M.D.
 Department of Health and Human Services
 Director
 National Institutes of Health
 Bethesda, MD 20892

VA Representative — to be named

DOD Representative — to be named

Executive Secretary

McLaughlin, Jack A., Ph.D.
 Associate Director for Extramural Research
 National Eye Institute
 National Institutes of Health
 6120 Executive Boulevard, Suite 350
 Bethesda, MD 20892

*Reappointment Pending
 Note: Two additional members with term
 expirations of 11/30/97 will be named.

cil (Table 1). Among current members of the Council are optometrists Dr. Lynn Cyert, professor, Northeastern State University College of Optometry; and Dr. Joseph Shovlin, immediate past chair of AOA's Contact Lens Section (Table 2).

The National Eye Institute currently supports about 75 percent of all vision research conducted in the United States at approximately 250 medical centers, hospitals, universities, and other institutions. From an initial appropriation of \$24 million in 1968, the NEI's budget today totals more than \$275 million to

support approximately 1,500 research projects.

NEI-sponsored research has resulted in dramatic achievements. Among the most notable are:

- Pioneered the medical use of lasers and proved that laser surgery can save the sight of people with diabetic retinopathy and other eye diseases.
- Reduced the incidence of blindness caused by retinopathy of prematurity.
- Improved corneal transplantation procedures and methods of preserving corneal tissue.
- Improved surgical techniques to

remove cataracts, making this procedure one of the most successful surgeries performed today.

- Supported development of drugs to treat glaucoma.

The Future

In a recent speech before a science writers seminar sponsored by Research to Prevent Blindness, Dr. Kupfer said that advances against vision-impairing diseases promise to bring about significant reductions in the nation's health care costs.

Dr. Kupfer noted that if drugs now under development against cataracts, a sight-impairing clouding of the eye's lens, prove effective in delaying lens-replacement surgery for just 10 years, they would reduce the need for lens-replacement surgery by about 45 percent and save the federal government \$2.5 billion annually.

Among his other predictions:

- **Diabetic Retinopathy:** Future studies should provide a greater understanding of this blinding complication of diabetes, leading to the development of viable therapeutic approaches to prevent the onset of diabetic retinopathy.
 - **Glaucoma:** Future investigations should yield a greater understanding of the risk factors and the role that elevated intraocular pressure plays in affecting the optic nerve. Such knowledge could lead to improved diagnostics and more effective treatment strategies for the more than three million Americans with glaucoma.
 - **Age-Related Macular Degeneration:** Scientists will learn more about the disease process and identify the biochemical factors that lead to photoreceptor degeneration. Using this knowledge, researchers may be better able to control age-related macular degeneration and improve the quality of life for millions of people during their retirement years.
 - **Retinitis Pigmentosa (RP):** With continued success in identifying the gene that causes RP, vision researchers should begin to develop DNA probes and biochemical assays to better identify the various forms of the disease. If successful, these investigations will provide eye care professionals with tools to diagnose RP earlier and provide the scientific basis for effective treatment of this now incurable disease.
- Dr. Kupfer emphasized that eye disease will become an even greater public health problem in the future with the "graying" of the American

population. Today, there are 32 million Americans age 65 and older. By the year 2030, there will be 66 million, all of whom will be at high risk for age-related eye diseases such as AMD, cataract and glaucoma.

Dr. Kupfer stated that ongoing progress in vision research will help to protect the vision of more older Americans than ever. "Because of Congress' foresight and the public's eagerness to support vision research, scientists have made tremendous progress toward helping all Americans keep their vision for a lifetime," said Dr. Kupfer. "With the continued expansion of vision research, we can make each of these predictions come true."

Future Funding

The future for vision research looks promising, but there are signs warning of danger. The NIH appropriation has increased over 156% in the last 10 years (1983 to 1993), whereas the NEI appropriation has increased only 95%. In constant dollars, the NEI has only realized a 15.54% increase in funds during this same time period to constitute its obligations. NEI's share of the overall NIH budget has continued to drop from 3.3 percent in FY86 to a low of 2.7 percent in the FY94 budget that had been proposed by President Clinton. This would have resulted in a \$3.7 million funding cut.

In written testimony submitted to the Senate Appropriations Committee, Subcommittee on Labor/HHS/Education, the American Optometric Association recommended approval of \$359,553,000 for the 1994 NEI budget, an increase of \$83.4 million over FY93, to provide critical support for eye research advances necessary to improve the health and quality of life for millions of Americans each year. The final appropriation by Congress for FY94 was \$290,260,000 which is a 5.2% increase over the preceding year. This was an actual increase of \$14,347,000 over FY93.

The percent of eligible NEI dollars going to optometry schools is currently 2.8%. This has increased from a low of 1.4% in 1975. The percent of eligible NEI dollars going to optometry researchers is 2.3%.

Alliance for Eye and Vision Research

Realizing that coalition building is increasingly used to raise the visibility of healthcare issues, a number of organizations have come together to

	In \$1000's	Indiv. Investig.	Research Training	Facilities	Instrumentation
IU	312	312	—	—	—
NEWENCO	104	104	—	—	—
PCO	79	79	—	—	—
SCO	63	63	—	—	—
SUNY	197	166	32	—	—
UAB	1,095	640	128	318	8
UCB	3,206	2,541	355	276	34
UH	1,197	858	33	288	18
Totals	6,253	4,763	548	882	60

Note: This information was originally presented by Dr. Anthony Adams, dean, University of California, Berkeley, School of Optometry, at the November 1993 AOA/ASCO Summit on Financing Optometric Education.

create just such a voice for eye and vision research — the Alliance for Eye and Vision Research. Over 50 eye and vision-related organizations have been invited to join the Alliance. ASCO was one of 15 organizations participating in a prospective members meeting in Washington in September 1993.

Among the goals of the Alliance for 1994 are:

- Track and monitor federal funding for eye and vision research, as well as all policies relating to and affecting such funding.
- Develop public education strategies/initiatives for AEVR member organizations to undertake in support of increased FY 1995 appropriations funding for the National Eye Institute, and increase visibility, understanding and support for eye and vision-related research within the public, in Congress and within the Administration.
- Ensure Alliance participation in public activities to increase public education on the importance of eye and vision research as they relate to neuroscience and recognition of the critical role of vision in neuroscience research, emphasizing the Decade of the Brain.

- Meet with Members of Congress and Administration officials to educate them about and increase the public record on eye and vision-related research.
- Facilitate public and political participation at regional NEI 25th Anniversary events. ■

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Acknowledgements

The following people provided special assistance in researching this article.

Jean Horrigan, program director, NEI 25th Anniversary, National Eye Institute
Gordon G. Heath, O.D., Ph.D., Indiana University School of Optometry
John C. Whitener, O.D., M.P.H., American Optometric Association
Anthony J. Adams, O.D., Ph.D., University of California-Berkeley, School of Optometry
Karlin McLain, librarian, American Optometric Association

Fostering A Healthy Research Environment—A Blueprint for the Optometric Educational Institution

Felix M. Barker II, O.D., M.S.

Introduction

Maintaining an effective optometric educational institution is a complex process involving the combined efforts and commitment of the administration, faculty and other personnel working together to envision their future and to identify and execute their mission. Within such an organization, the fostering of a healthy growth-oriented research environment requires that this key component of academic endeavor be supported as an **essential** part of the institutional mission at every level of the institution's administration, faculty and staff. For research to flourish, there must be a mutual respect among all involved parties and a shared commitment to the achievement of excellence.

Dr. Barker is associate professor at the Pennsylvania College of Optometry and director of its Light and Laser Institute. He is also editor of Optometric Education.

Research at the Pennsylvania College of Optometry

At the Pennsylvania College of Optometry (PCO), we have had a reasonable degree of success in the research arena over the past fifteen years. This success occurred under the leadership of Dr. Tony Di Stefano, our vice president for academic advancement. A hallmark of PCO's research program is our ability to assemble and support a significant externally funded research program amounting to between 1 and 2 million dollars annually. The research program encompasses a broad range of topical areas including visual genetics and molecular biology. PCO takes special pride in this program because we have been able to achieve it in the context of a private, free-standing college.

If we have been able to achieve in research, it is primarily because of the capabilities and the imagination of the people within our organization. But all institutions have such people, and the real secret ingredient for us has been

that we have had a vision and the institutional will to carry the vision forward. Our vision of research in the areas of emphasis I have mentioned has lead to a commitment to recruit and develop researchers within our educational environment who make real scientific and financial contributions to our program.

The bottom line for us has been attitude. As with any successful program, we have been able to foster an attitude of commitment to research in both administration and faculty.

Rationale for a Commitment to Research

Nurturing Vision — Just as vision proceeds from the imagination of an individual, organizational vision is derived from the collective ideas and research of those who comprise the group. The nurturing of the vision within the institution or the profession is a real reason for committing to the research process. Research, in this context, represents an institutional thought process about what might be and what ought to be. It serves as a basis for vision.

Part of mission — We need to recognize the historical position of research as one of the legs of the three-legged stool of **EDUCATION, RESEARCH and SERVICE** that AOA past president Jim Leadingham has described as the hallmarks of a profession.

Education in an environment of scientific inquiry — In order to set the stage for lifelong learning, we need to adopt the attitude that the education of our professional level students of optometry should occur within an environment that fosters inquiry. Furthermore, this inquiry needs to address both fundamental mechanisms of health and disease and the success of clinical applications. Future optometrists need to have a first-hand sense of where their clinical interventions fit within the spectrum of knowledge development and of how change occurs across this spectrum.

Faculty development — Research activities are the most significant tool for developing and maintaining our faculty. There is something sterile about the pure academic delivery of didactic information. We would never accept the concepts presented to us about clinical care from a lecturer who did not practice. Within the academic setting, there is the added dimension of the need to "practice" your area of expertise

by involvement in the creation of new scientific knowledge. This not only enables the faculty member to "stay current with" but also to "become a part of" the current literature. Whether clinician or basic scientist, this need is universal and must be met by the personal commitment of each of us to its fulfillment.

Institutional reputation — It goes without saying that with a commitment to research, our schools and colleges will have greatly enhanced reputations. This will have a nurturing effect upon our research programs and, in turn, will have significant impact upon how our profession is viewed by other agencies with which we must communicate concerning legislative and regulatory issues.

Financial benefits — Even though research requires initial and periodic investment, the well-developed research program can become relatively self-sustaining and even profitable in the narrow sense. We should not, however, pursue research purely as a potential profit center, but rather should make our commitments based upon our vision and then utilize the dollars we can generate to sustain that vision.

Resource Development

Faculty — The faculty are the most important resource in any program. Regardless of their level of involvement in research, they must be committed to the idea of research as an integral part of mission. This belief comes naturally to those trained as classical researchers, but we can also usefully involve all faculty, including clinicians, in a positive research process, and the desired commitment will naturally ensue. Developing and supporting this internal drive to do research within our faculty is probably the most important ingredient for success. It can make up for a shortage of resources.

Time — There must be appropriate time for all faculty to do research, and for that faculty member who becomes infected by the research "bug," there must be a visible, user-friendly mechanism to obtain more time and other start-up resources.

Facilities and equipment — While good facilities are always a necessity, we need to recognize that there will always be a dearth of the resources needed for research and for education. However, the successful research community will exercise creativity in the use and development of their facilities and, with success, comes growth.

Services — There should be identifiable services that are committed from the institution on behalf of the research community. Researchers need to know that they will be supported by appropriate technical, accounting and other essential services in order to remain focused on their task.

Leadership — If you have all the other components we have just discussed, you will still not experience growth in the program if there is not a demonstrated commitment from the leadership of the institution. This is an **axiomatic pre-condition for success** and applies both to the administration and to the faculty leaders of the institution.

Funding Uncertainties

Extramural funding may be unstable even for the experienced researcher because the faculty member may not have the appropriate credentials for the grant and may, therefore, need to collaborate with other scientists. The

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preparation of the grant, including pilot work, may be insufficient. Within the review process the grant may not be written well, the competition may be too stiff or, in some cases, even good grants can be affected by a reviewer mismatch. Finally, in the current competitive funding setting, there are many good grants that are not funded due to budgetary limitations.

Developing Commitment

These ideas are presented as a backdrop of continuing uncertainty about **anyone's** ability to maintain a continuous level of external funding, and they contain a message to the institutions about commitment — namely that developing commitment is more than **just deciding** research is a priority.

Since maintaining continuous external funding for researchers is doubtful for even our best and brightest, we should plan for the times when grant money is difficult to obtain. Often the

difference between ultimate success and failure is one more try, one more rewrite of the grant. But persistence is difficult when your basic position is at risk. So, while we should not expect our profession and its institutions of education to pay for research per se, we should plan for the maintenance of our carefully constructed vision by our commitment to the research community and its needs over the rough spots. We need to remember that research is our goal and that it is part of the vision we have developed. Funding is just the means of achieving the goal.

Leadership — There is no doubt that the leadership of the institution, embodied by the faculty and administration, is a most critical component of our ultimate success. This is where the vision and the mission are derived. A commitment to the planning and resource development necessary for a viable program should flow from the vision. Without this leadership, even good faculty and resources will fail.

Faculty capabilities — Revitalization through regular faculty leave and redevelopment is critical, not only to faculty success, but also to assuring internal faculty commitment. We should pay attention to the capabilities of our faculty and realize that their initial package of education and training will not be sufficient for entire professional careers.

Institutional commitment — Finally, all of our institutions need to make their own commitments to research. While they may differ widely, each institutional community must accept research as a part of its vision, as part of its institutional imagination. This acceptance, more than any other factor, will determine the long-range success of an institution's research and educational programs. ■

CALENDAR

ASCO Committee Meetings — June 22, 1994. Minneapolis, MN. Contact: Rebecca M. Defibaugh (301) 231-5944.

ASCO Executive Committee Meeting — June 22, 1994. Minneapolis, MN. Contact: Martin Wall (301) 231-5944.

ASCO Annual Meeting — June 23-24, 1994. Minneapolis, MN. Contact: Martin A. Wall (301) 231-5944.

ASCO Annual Luncheon — June 24, 1994. Minneapolis, MN. Contact: Martin A. Wall (301) 231-5944.

Utilizing the Patient Management Problem as a Student Clinical Evaluation Tool

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Abstract

A two-dimensional Patient Management Problem (PMP) test was designed for use as a measure of clinical competency at Pacific University College of Optometry. To measure its validity, two versions were administered to a group of third year students prior to and following their third year clinical experience. A group of fourth year students and a group of faculty also took both sets of PMPs as an additional means of determining the validity of the test. The third year students performed significantly better ($p < 0.005$) on the PMP at the end of the year compared to their performance at the start of the year. The fourth year students had higher scores than the third year students on parts of the first PMP administration: diagnosis ($p < 0.01$) and treatment ($p < 0.005$); this difference was not present at the time of the second PMP administration. Positive correlations were found with Grade Point Average, NBEO scores and Clinical Evaluations. Two focused evaluation methods are discussed.

Key Words: Patient Management Problem, PMP, problem solving, patient simulation, optometric education, clinical competency

Introduction

Courses within the Pacific University College of Optometry curriculum are generally graded based on examinations, and, in most instances, this is accomplished with conventional testing methods. In addition to the measurement of proficiency in didactic courses, the assessment of clinical abilities is essential in the education of the optometric student; however, conventional testing may not measure the appropriate skills needed for patient care.

At present, clinical evaluations are accomplished using daily rating slips and an end-of-the semester profile evaluation filled out by the staff optometrists assigned to each intern.

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This process provides a limited means of performance evaluation due to its subjective nature. We searched for a more objective means of evaluating clinical competency as well as a way to identify third year students who might require additional help before advancing to their fourth year clinical program.

Various definitions of clinical competency and a number of theories on the appropriate means of measurement are presented in the literature. Neufeld and Norman, in describing clinical competency, list a number of abilities required in patient encounters: technical skills, knowledge and understanding, interpersonal attributes, clinical skills, problem solving, and clinical judgment.¹ This list established a basis for identifying the areas we thought important to evaluate.

We found that the first three of these abilities, technical skills, knowledge and understanding, and interpersonal attributes, are currently assessed adequately. The technical skills necessary during an optometric exam are primarily taught in pre-clinic courses and these skills are evaluated continuously. In addition to written exams, the pre-clinic courses utilize one-on-one proficiency evaluations to assess the student's ability to perform a procedure or to demonstrate competent use of an instrument. The basic knowledge and understanding of optometric conditions, necessary for the student to accomplish a thorough and efficient examination, is gained during the academic portion of the program and evaluated in each course. A course designed to educate the student in interpersonal attributes is taught in the third year and aids the student in working toward positive and productive patient communication. This course utilizes traditional testing methods and self-evaluations of taped simulated patient encounters.

The remaining items in the Neufeld and Norman list — clinical skills, problem solving, and clinical judgment — are very closely interrelated and their evaluations should be integrated in a common objective evaluation. Clinical skills include the ability to obtain relevant information from the patient by eliciting verbal information in the case history and by gathering actual data through physical examination. In order to handle a problem effectively, the student must be able to gather, process, and interpret data before advancing to the problem solving and clinical judgments necessary to formu-

late a diagnosis and develop a treatment plan. These steps require an ability to weigh the patient's presentation of symptoms and signs against acquired knowledge, to make choices in the data gathering process, and to formulate working diagnoses in the process of defining the patient's problem.

Problem solving abilities are recognized as being difficult to evaluate, and, according to Gross, involve two major components: data gathering and diagnosis/management.² Neufeld and Norman suggest that the multiple choice type of test should be limited to testing factual knowledge and may not be representative of the range of intellectual "activity" in the decision making process.¹ Written simulation exercises for measuring decision making skills have been designed and are called Patient Management Problems (PMPs). PMPs simulate reality and attempt to reproduce the decisions a practitioner must make when investigating and managing a patient. They attempt to mimic the circumstances of a real-life patient encounter, and they demand the same cognitive and problem-solving processes as would be required in the exam of an actual patient.¹ However, unless the PMP measures different or additional aspects of clinical competence from those tested by traditional methods (written examinations, staff evaluations, instrument and procedure proficiencies), the benefits do not outweigh the difficulty of producing, administering, and grading such an instrument.

The PMP is an objective assessment designed to evaluate the "clinically relevant knowledge" component of competence that cannot be assessed by multiple choice questions or other conventional test instruments.¹ PMPs have been utilized in the credentialing of the health care professions. A number of studies have found only low to moderate correlation between PMPs and multiple choice tests, suggesting that the two types of tests measure different capabilities.^{1,2,3} The National Board of Medical Examiners studied the correlation between Part II, a comprehensive multiple choice type test that evaluates knowledge of basic medical information, and Part III which uses patient management problems. A positive yet moderate correlation value reflected "... the degree of correlation expected between medical knowledge and additional elements of clinical competency inevitably based on knowledge but representing skills to a degree independent of factual knowl-

edge." If the correlation were high, the PMP would be measuring attributes already tested.³

There are several models of PMPs in use in health care professional evaluation.⁴⁻¹³ Each has limitations or confounding factors that make equitable scoring difficult. The original model was linear in that the examinee was only required to choose whether a test or procedure should be done. Utilizing this type may reward the clinician who is very thorough (perhaps "plodding") at the expense of the individual who is insightful, quickly recognizes the patient's problem, and determines a correct diagnosis with less data gathering.² As a result, the more insightful individual achieves a lower score.

The branching type of PMP directs examinees to choose the test or procedure options they feel are necessary; the information obtained in these choices then leads to further test or procedure options. The option chosen may direct the test taker to a particular section for further evaluations, while another student, utilizing a different option, might not access that specific section. Examinees are consequently taking different tests while using the same PMP, dependent upon the "branch" they choose to pursue. The results can be difficult to evaluate and, indeed, may not be equitable between any two examinees.

A two-dimensional PMP designed by Gross incorporated additional choice requirements.² Using this design, the examinee is required to indicate which data are to be collected and then indicate *why* the data are obtained or are not obtained. This adds a further interpretive step to the test instrument and is intended to evaluate the clinical thinking and decision-making abilities of the test taker. A rating system is then established to weigh the options used based on the difficulty of arriving at a decision.

One of the advantages in the well-written PMP is that the data remain constant for all examinees; each examinee can "see" the same "patient" and the "patient" is available at all times. Careful preparation in the writing of the PMP is necessary to standardize the structure and form of the PMP. A candidate may be able to rule various hypotheses in or out based on the options included or excluded. This should be eliminated by providing the same extensive list of procedures and tests on all PMPs. PMPs can be designed which have identical structure but differ in the language of the

presenting complaint and in responses to neutral options such as age, gender, etc. These can then appear to be different patients, but require the same approaches for the solution.¹⁴

Methods

We used three groups of subjects in this study: third year students, fourth year students, and a group of faculty.

The first group of subjects, 55 third year optometry students, took two of the PMPs in the fall at the beginning of the academic year; 28 members of this group then took two different PMPs at the end of the spring semester. All of those who had taken the first set of PMPs were asked to take the second part, but nearly half of them felt they could not afford the time required.

The second group of subjects was 12 fourth year students who had completed one semester of patient care in their fourth year. They took all four of the PMPs at the same time.

The third group consisted of 11 faculty who also took all four PMPs. This was a cross section of the faculty, some of whom are primarily clinical staff and some of whom teach in both the clinical and the didactic curricula.

PMP

Utilizing the two-dimensional format, which the National Board of Examiners in Optometry has incorporated into Part III - Patient Care, we designed a test to evaluate students in the spring of the third year. It was difficult to reproduce the NBEO test format which uses a latent image design; the answers are printed in "invisible ink" which are developed with a latent image marker. We found only one company which had the capability of producing such a format and for the relatively small number of tests we required (100 copies of four different PMPs), the production costs were unreasonable. We were assured by another company that this could be accomplished with the use of a modified and rebuilt Ditto machine and months were spent investigating this avenue. A local state university attempted this and was unsuccessful. Another option which seemed workable was the use of color scrambled text.¹⁵ None of the various local printing companies were willing to guarantee that they could successfully print the scramble without the answer bleeding through.

The format finally used was a gray overlay which could be scratched off exposing the printed answer under-

#	ITEM	PROBLEM RELATED (A)	DATA BASE (B)	REASSESSMENT (X)	CONTRA-INDICATED
1C	VA near uncorrected	OD 20/200 OS 20/200 OU 20/200	OD 20/200 OS 20/200 OU 20/200	re-assessment noted	not assessed
2C	VA distance uncorrected	OD 20/200 OS 20/100 OU 20/100	OD 20/200 OS 20/100 OU 20/100	re-assessment noted	not assessed
3C	VA dist w/most recent spectacle Rx	OD 20/100 OS 20/80 OU 20/80	OD 20/100 OS 20/80 OU 20/80	re-assessment noted	not assessed
4C	VA: near w/most recent spectacle Rx	OD 20/100 OS 20/80 OU 20/80	OD 20/100 OS 20/80 OU 20/80	re-assessment noted	not assessed
5C	VA: pinhole at distance w/habitual	OD 20/80 OS 20/60	OD 20/80 OS 20/60	re-assessment noted	not assessed
6C	Verification of most recent spectacles	OD +1.25-1.00x060 OS +.75-1.25x120 Add +2.75	OD +1.25-1.00x060 OS +.75-1.25x120 Add +2.75	re-assessment noted	not assessed
7C	Keratometer measurement	OD 43.75 @ 005 44.25 @ 095 OS 42.50 @ 035 44.00 @ 125	OD 43.75 @ 005 44.25 @ 095 OS 42.50 @ 035 44.00 @ 125	re-assessment noted	not assessed
8C	Pupillary distance	64/60	64/60	re-assessment noted	not assessed
9C	Ref. cond. obj. dist. non-cycloplegic	OD +.75-1.50x060 20/100 OS +.50-1.50x115 20/80	OD +.75-1.50x060 20/100 OS +.50-1.50x115 20/80	re-assessment noted	not assessed

FIGURE 1
Example of PMP Data Collection Page

neath. Each overlay area within a category was the same size thus providing no cue as to the amount of information included in each item. While it was still rather costly, the overlay proved to be quite effective.

Information from an actual case was found to be the best foundation to begin drafting a PMP, eliminating the need to invent most of the findings. Information not provided in the actual case was completed and care was taken to provide reasonable, consistent, and valid data for all options. Those items not normally selected require credible data since a response not appropriate to the patient profile might provide cues to the examinee who, either inadvertently or in error, does make that choice. A pool of generic responses

was designed giving age-normed information for those items which were not germane to that particular patient's problems and which therefore contain "normal" data. These cases were reviewed, modified, and weighted by three of the faculty who were trained in the objectives and administration of the test instrument.

The PMP begins with a short case history containing relevant patient information. Following this are two data bases which together provide a list of 90 procedures. The first data base contains General Data and the second Problem-Specific Data. A sample page without the overlay is shown in Figure 1. Examinees must respond to each item in each data base according to the options shown:

"A" indicates that the data are RELATED to the patient's clinical symptoms or signs and are LIKELY to be necessary to diagnose the patient's condition.

"B" indicates that the data are UNRELATED to the patient's clinical symptoms or signs and are UNLIKELY to be necessary to diagnose the patient's condition.

"X" indicates that data originally thought to be in the "B" category are believed to belong in the "A" category once that item or additional information is obtained; it allows for data which may reference each other. This category also measures the examinee's ability to reassess information and attach importance

TREATMENT OF PATIENT

CONTACT LENSES

Based on the existing data for this patient, select the contact lens treatment(s), if appropriate. Indicate each type of contact lens that you would prescribe (e.g. toric single vision, toric bifocal) by circling the response for a (RPG) or b(soft lens). For each type of contact lens prescribed indicate the parameters that are important to specify in relation to the patient's diagnosis(es), and occupational, vocational and other personal needs. You may select as many or as few parameters as apply for each contact lens type by circling the corresponding response(s) (c-m). Contact lenses and/or parameters that you would not prescribe should be left blank.

CONTACT LENS PARAMETERS THAT YOU SPECIFY

	Lenses Prescribed				Base Curve	Diameter	Center thickness	Optical zone	Peripheral zone	Lenticular optical zone	Material permeability	Edge design	Care system
	RPG	Soft	Power	Prism									
Type of contact lens	a	b	c	d	e	f	g	h	i	j	k	l	m
9. spherical, single vision	a	b	c	d	e	f	g	h	i	j	k	l	m
10. spherical, bifocal	a	b	c	d	e	f	g	h	i	j	k	l	m
11. toric, single vision	a	b	c	d	e	f	g	h	i	j	k	l	m
12. toric bifocal	a	b	c	d	e	f	g	h	i	j	k	l	m

FIGURE 2
Example of Treatment Page

to it based on test results and undiagnosed conditions.

"C" indicates that the gathering of this particular item is contraindicated and is not obtained because the nature of the procedure or the patient's condition makes obtaining these data a risk to the patient.

Data not desired and not contraindicated are left undisclosed.

Thus, the examinee not only chooses the procedures to be done but also gives a reason for each choice. The information for any single item elicited when choice "A" is uncovered is identical to the information given when choice "B" is uncovered.

Following the data collection there is a section containing a list of possible diagnoses. This list should be extensive to decrease the chance that the choice is influenced by the options included. Sophisticated distracters should be included; these are possible diagnoses that might be chosen if the examinee does not gather all the necessary data or interprets it incorrectly. In addition to determining the diagnoses (there can

be and probably is more than one), the examinee must indicate the clinical significance of each diagnosis.

The treatment section contains the following areas: Spectacle lenses, Contact lenses, Pharmacologic therapy, Low vision therapy, Vision therapy, and Medical/Surgical/Referral. Each of these areas contains a list of options. When the student chooses a treatment option, she/he also indicates characteristics of that treatment which are important. An example is shown in Figure 2. The examinee then determines a prognosis, based on the successful completion of the treatment, and finally indicates when the first follow-up visit is needed. For a more detailed description of the structure and development of a PMP the reader is referred to The National Board of Optometry's Publication "Patient Management Problems Case Writer Manual."¹⁶

An extensive instruction set accompanied the PMPs and included an explanation of each of the sections and what they contain. The categories of responses were described in detail similar to the explanations given above,

with a lengthy explanation of category X. The examinee was instructed to first obtain all the information considered to be *problem related* (category A) and then to select those items considered to be *data base* (category B). A warning was given that a penalty could be assessed for the overuse of category X. A complete copy of the instruction set is available upon request from the authors.

According to Wolf et al, the construct validity of the PMP is demonstrated when students perform significantly better on PMPs after completing a problem-solving curriculum than before.¹⁷ We, therefore, administered the first two PMPs to the third year students just before they began their clinic rotation. The final two PMPs were administered in the spring at the end of the third year clinic. As another measure of construct validity, the four PMPs were given to a group of fourth year students who had completed a semester of fourth year clinic. If the PMP has validity, the scores should improve as experience with clinical problems increases.¹⁸⁻²¹ Therefore, it was expected

TABLE 1
Scoring Matrix

Correct Response	Response A	Response B	No Response	Response C
A	5	0	-5	-7
B	2	3	-2	-7
A or B	3	3	-2	-7
A,B, or No Response	0	0	0	-7
C	-30	-30	-30	+30

INTERN EVALUATION FORM

INTERN _____ DATE _____

EVALUATOR _____ CLINIC _____

Please circle the appropriate response.

	VERY POOR	AVERAGE	EXCELLENT
TECHNICAL SKILLS			
Keeps accurate and complete records	1 2 3 4 5 6 7 8 9 10		
Collects valid data in an orderly fashion	1 2 3 4 5 6 7 8 9 10		
Collects enough data to make effective diagnosis	1 2 3 4 5 6 7 8 9 10		
Collects data efficiently	1 2 3 4 5 6 7 8 9 10		
DIAGNOSTIC SKILLS			
Is able to pursue history into secondary and tertiary problem areas	1 2 3 4 5 6 7 8 9 10		
Bases diagnosis on history, complaint and observed test results	1 2 3 4 5 6 7 8 9 10		
Makes decisions on sound data and good clinical judgments	1 2 3 4 5 6 7 8 9 10		
DATA ANALYSIS			
Understands relationships of various tests	1 2 3 4 5 6 7 8 9 10		
Uses more than a single test to determine nature of problem	1 2 3 4 5 6 7 8 9 10		
Presents a clear description or analysis of problem	1 2 3 4 5 6 7 8 9 10		

FIGURE 3
Intern Evaluation Form

that the fourth year students would show better scores than the third year students at least on the first two PMPs.

The possible choices and weighting of each item were based on decisions by a group of experienced clinicians. These were clinical faculty members, each of whom has been involved in primary care, with a knowledge base

including binocular vision, pathology, and contact lenses. Each item was evaluated based on the final diagnoses and usually had one best answer, with the remaining options having differing degrees of correctness. The various responses were given a value based on the degree of necessity or usefulness; i.e., if B is the best answer then A is

a better choice than C or NO RESPONSE. Table 1 shows the scoring matrix used.

Items considered neither necessary nor useful were not scored. The item scores were then summed and recorded as the data total.

A threshold score was the basis of the scoring procedure for the diagnosis section. In order to obtain the threshold score the individual must correctly choose the primary diagnosis or diagnoses. The diagnoses (there were more than one on each of these PMPs) essential to each case were collectively assigned a threshold score of ten. In order to earn any credit for responses in the diagnosis section, the primary diagnoses must all be chosen. If they were not, a score of zero was given for the section. If they were chosen, additional points were added to this ten-point threshold score as follows: additional secondary diagnoses were valued at two points each and the correct prognosis and follow-up re-appointment schedule were given one point apiece. A penalty of two points was assessed for each incorrect diagnosis. All points were then summed (including the threshold score) and the sum recorded as the score for the diagnosis portion.

The treatment section was scored likewise with a threshold score of five for the necessary treatment(s) and one point for each correct modifier and additional treatment considered secondary. These were summed and recorded as the treatment total. Again if the threshold score was not initially obtained, a score of zero was given for this section.

Data Analysis

A number of comparisons were completed both between and within groups. Non-parametric statistical test procedures were employed due to the scaling of the PMP test scores. It is impossible to insure that the PMP scores constituted interval data and that the scores were normally distributed. Both of these conditions (among others) must be met in order to use parametric statistical tests. Because of these concerns, all hypothesis testing was conducted using conservative non-parametric procedures.

Intra-group comparisons utilized the Wilcoxon Signed Rank Test. For this comparison the score on the data section of PMP 1 was added to the score of the data section on PMP 2; this was then compared to the sum of the data section scores for PMP 3 and PMP 4.

The sums of the other two sections (diagnosis and treatment) were also compared. The scores of all the sections were totaled and the total for the first two PMPs was compared to the total for the second two PMPs. This comparison was done for the third year group, for the fourth year group, and for the faculty group.

Repeated measures analyses of each PMP section and the PMP total were conducted for each group using the Friedmann Test. The Kruskal-Wallis Test was used to compare the scores between groups for each section of each PMP and for the total of all sections for each PMP. For those comparisons in which a difference was found, the Mann-Whitney Test was utilized for post hoc testing to specify the actual group difference.

A number of correlations were run between compilations of scores achieved on the PMPs and other factors including Grade Point Average (GPA), the Clinical Evaluation, and the NBEO Clinical Science Examination score. The GPA was compiled from the grades achieved from those courses completed prior to the time the student took the second part of the PMP examinations. The Clinical Evaluation was completed by the supervising optometrist at the end of each term, rating various characteristics on a scale from one to ten. Items included in the Clinical Evaluation are listed under three categories: technical skills, diagnostic skills, and data analysis. The form is shown in Figure 3. This information was available only for the third year students. The NBEO Clinical Science Examination from 1988 contained the following sections: Systemic Conditions, Ocular Disease/Trauma, Refractive/Oculomotor/Sensory Integration Conditions, Perceptual Conditions, Public Health, Clinico-legal and Clinical Pharmacology. These scores were only available for the fourth year students.

This project, in addition to assessing the validity of this particular model of PMP, sought to establish a pass/fail criterion. Scoring options were explored to determine a passing score. One method for obtaining the passing score is determined by the following equation:

PASSING SCORE = 60%(Maximum Data Collection Score) + Diagnosis Threshold + Treatment Threshold

With the maximum data collection score worth 100 points, the sum then gives a passing score of 75 points. A second method of determining the passing criteria is to require that the

TABLE 2
Correlations

	Data Total	PMP1 + PMP2	PMP3 + PMP4	PMP Total	GPA	Clinical Eval	NBEO II Total
Data Total	1						
PMP1 + PMP2	0.763	1					
PMP3 + PMP4	0.269	0.394	1				
PMP Total	0.951	0.853	0.771	1			
GPA	0.506	0.288	0.210	0.544	1		
Clinical Eval	0.558	0.185	0.554	0.548	0.182	1	
NBEO II Total	0.635	0.467	0.268	0.663	0.598		1

examinee pass two out of the three sections. Passing the diagnosis and treatment sections consists of achieving threshold. Passing the data collection section consists of achieving 70% of the total possible points in that portion. No decisions have yet been made regarding the minimum number of cumulative points necessary for a passing score when taking several PMPs.

Results

The intra-group comparison between scores on the first set of PMPs and the scores on the second set of PMPs showed differences for the third year students on all sections: diagnosis ($p<0.05$), treatment ($p<0.005$), data collection ($p<0.01$), and for the total scores ($p<0.005$); better performance occurred on the second set of PMPs. The same comparative analysis revealed no difference between the first set of PMPs and the second set of PMPs for the fourth year students or for the faculty.

The comparison of each individual section demonstrated that third year students performed successively better on each PMP with the exception of the data section: diagnosis ($p<0.05$), treatment ($p<0.005$), total ($p<0.005$). There were no differences between any of the parts on each of the PMPs for the fourth year students. The faculty results

showed a difference only on the treatment section ($p<0.05$) with the scores indicating better performance on PMP 2 than either PMP 3 or 4.

Inter-group comparisons revealed a difference in performance between the third year students and the fourth year students on the first set of PMPs in diagnosis ($p<0.01$) and treatment ($p<0.005$) with the fourth year students exhibiting better scores. No significant difference was indicated on the data collection portion or on the total. The comparisons for the second group of PMPs showed a difference between the third and fourth year students only on the diagnosis ($p<0.05$) with the fourth year students receiving higher scores.

The faculty achieved higher scores than the fourth year students on all sections of the first two PMPs. All differences were significant with the exception of the treatment section: diagnosis ($p<0.01$), data collection ($p<0.01$), total ($p<0.005$); only the diagnosis portion of the second set showed a significantly higher score for the faculty ($p<0.05$). The faculty received higher scores than the third year students on all parts of the first two PMPs: diagnosis ($p<0.005$), treatment ($p<0.005$), data collection ($p<0.005$), and the total ($p<0.005$); the higher scores were significant only on the diagnosis section ($p<0.005$) for the

TABLE 3
Percent of Passing Scores

	.6(DCS)+DT+TT*	2 of 3 Passed
PMP 1 - 3rd Year	61%	58%
PMP 1 - 4th Year	67%	83%
PMP 2 - 3rd Year	67%	65%
PMP 2 - 4th Year	58%	83%
PMP 3 - 3rd Year	79%	82%
PMP 3 - 4th Year	75%	83%
PMP 4 - 3rd Year	79%	89%
PMP 4 - 4th Year	83%	100%

*DCS = Maximum possible Data Collection Score

DT = Diagnosis Threshold

TT = Treatment Threshold

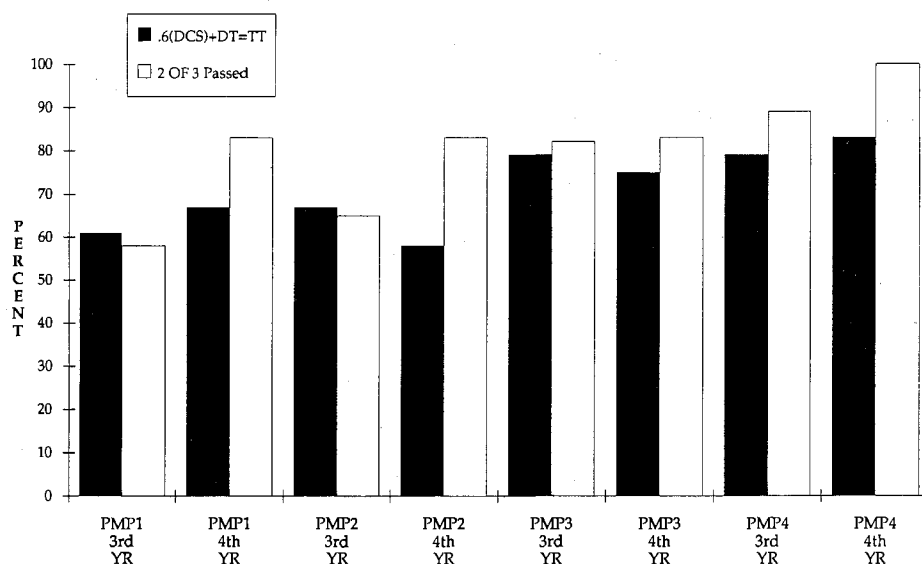


FIGURE 4
Graph of Passing Scores

have achieved a passing score based on the two methods described above. Figure 4 is a graphical representation of this information.

Discussion

In the evaluation and scoring of the Patient Management Problem, two objectives were considered—the purpose of the test itself and the population tested. In this project we were evaluating a vehicle to assist in the assessment of the third year students' data gathering and clinical thinking skills. By the completion of the third year in the optometric curriculum, students should be adept at gathering data and recognizing when additional testing is needed. Students should be able to accurately diagnose refractive conditions; however, they may not yet be clinically adept at diagnosing functional and disease conditions, nor may they yet be ready to formulate treatment plans other than for refractive conditions. For this reason the data gathering section of the PMP was weighted more heavily than the diagnosis and treatment sections. The PMPs used in this study were prepared with these factors in mind and demonstrated primarily refractive conditions or high prevalence conditions such as cataract or glaucoma. With a more experienced population of examinees, the diagnosis and treatment sections might be weighted more heavily and more challenging cases prepared.

The improvement found in the third year students following their clinical experience suggests that the test instrument is evaluating the objective intended. The fact that there were no differences among the four PMPs on the data sections for the third year students indicates that they were able to collect data adequately at the start of the third year clinical experience. The interpretation of clinical information improves incrementally with experience. The performance of the third year student approaches that of the fourth year student on these clinical cases, as expected, since they were written for assessment of the third year students' level of knowledge.

It is of interest to consider the correlation between various PMP scores and other factors. The moderate correlation between PMP scores and GPA implies that the basic knowledge needed for performance in these two areas is similar. If the correlation were high (in the 0.8-0.9 range), we would conclude that PMPs and academic evaluations are analyzing the same characteristics; therefore, this particular

second set.

Positive correlations were found between the Grade Point Average and the data total of the four PMPs ($r=0.506$) as well as between the GPA and the total score of the four PMPs ($r=0.544$). A correlation between the score from the clinical evaluation and the total of the first two PMPs was low ($r=0.185$); this correlation was moderate with the total of the second two PMPs ($r=0.554$). In addition, there were positive correlations between the data total of the four PMPs and the NBEO Clinical

Sciences total ($r=.635$) and between the total of the four PMPs and the NBEO Clinical Sciences total ($r=.663$). Table 2 is a partial list of other correlations; it includes data showing correlations between the individual PMP totals and the GPA, the Clinical Evaluation, and NBEO Clinical Sciences total. (As stated previously, some data were available only for the third year students and some were available only for the fourth year students.)

Table 3 shows the percentage of third and fourth year students who would

testing instrument may be of no additional value over traditional methods.

The low correlation found in the third year group between the scores of the first two PMPs and the Clinical Evaluation is explained by the fact that the first set was given prior to their clinical experience and reflects this lack of experience. The moderate correlation with the second set indicates that those who have higher scores on the PMPs are those who have higher clinical evaluation scores. This may imply that patient management problems and clinical evaluations assess some of the same skills and some different skills; thus there is merit in utilizing both methods of appraisal.

The two methods presented for determination of a passing score are a first attempt and may require revision and evaluation. Using the equation, the relative weight of the data collection section is higher than that of the other two sections. In the second method, the examinee can pass the test if the diagnosis and treatment thresholds are achieved regardless of performance on data collection; however, the thresholds cannot be attained unless the primary diagnoses and the matching treatments are chosen. The choice between the two methods depends on the purpose of the test — either an emphasis on data collection skills or on diagnosis/treatment.

Some difficulties were encountered in the administration of the test; most were related to terminology. There was confusion about the meaning of "clinically relevant"; the term was not defined and there were several interpretations of the meaning expressed by students. In future administrations, this will be better explained and an example given to clarify the meaning. Another point to be addressed is the classification of the prognosis for a condition that is easily compensated with lens application but which will progress, for example, presbyopia. Perhaps an additional prognosis classification of "correctable or compensable" is needed for this type of condition. In the treatment section there was confusion about the term "education" — whether it meant referral to an educator (which was the intent) or whether it meant educating the patient about the condition present.

PMPs can be difficult and time-consuming to prepare using paper and pencil. The National Board of Examiners in Optometry has made available to the schools and colleges of optometry an authoring program which is

formatted in Windows. This user-friendly program allows the writer to compile each part of the PMP. Many items in the database provide information on normal age-related ranges to help in the choice of valid findings. This is a particular help when fabricating either a complete case or information that is not included in an actual patient record. The program also includes the weighting mechanism for all options. A supply of a modest number of cases can be the foundation for a great number of PMPs since slight modifications in the case history and in key data findings will create an entirely different PMP.

This trial utilized paper with an overlay; various individuals are presently working on programs that would allow for computerized administration of the test. To gain additional insight into the decision-making processes of the examinee, a program could be written which would record the order in which the student proceeds through the test sequence; the amount of time spent considering and evaluating results before he/she moves on could also be ascertained. These may be helpful in appraising the criticality of clinical thinking. Scoring these components, however, will pose a significant challenge.

The statistical findings verified that 1) we had a valid instrument which assessed additional skills not measured by our other methods; and, 2) that the scores did improve with clinical experience. The preferred method of determining the pass/fail score will require some additional consideration. We intend to use this testing instrument as another tool in the evaluation of clinical competency during the third year and perhaps, with further development, in the fourth year. The test will be very useful in identifying those students who need assistance in developing clinical thinking skills. In addition, experience with the PMP format should help prepare the students for Part III, Patient Care of the National Board Examination. ■

Acknowledgements

We would like to thank the following for their assistance:

Bradley M. Coffey, O.D., for providing his expertise in the statistical analysis methodology. Leon J. Gross, Ph.D., for his contribution to the test format and the idea of the gray overlay and for the useful constructive suggestions offered in the final written work.

A. Richard Reinke, O.D., for his help in arranging financing for the printing of the test instrument. Carole A. Timpone, O.D., for her guidance in

formulating and evaluating the clinical cases.

We also would like to thank Katherine A. Hinshaw, O.D., Nada J. Lingel, O.D., M.S., and Mark A. Williams, O.D., for their help in evaluating and weighting each item in the clinical cases.

Thanks also the National Board of Examiners in Optometry for allowing us to use the PMP format from the 1989 pilot examination.

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(continued from page 75)

"ReNu has enjoyed exceptional sales growth as a result of strong practitioner preference," said James E. Kanaley, president, Personal Products Division, and senior vice president, Bausch & Lomb. "ReNu continues to be the only true multi-purpose lens care solution in the U.S. market, providing consumers with an effective and easy-to-use product."

Sunsoft Announces Change In Toric 15.0 Lens

Sunsoft Corporation has announced a significant change in the pricing structure of its most popular and respected product, the Toric 15.0 Lens.

All Division III Toric 15.0 lenses have merged with the Division II Toric 15.0-line. In addition, Division III, which currently carries a direct price of \$78.50 will lower to join the direct price of \$65.00 now offered on the Division II.

To accommodate this change, Sunsoft's Guaranteed Fit Program will also undergo an enhancement. All Sunsoft torics will now be eligible for one free exchange and/or full credit when the lens is returned for any reason within 90 days of the original invoice. Additional exchanges may occur during the same 90 day period, subject to a \$10,00 non-refundable exchange charge.

For more information, call Sunsoft at 1-800-526-2020.

CIBA Sponsors Four Students

CIBA Vision Corporation provided a \$2,000 summer educational grant to four students at the Ohio State University College of Optometry. The grant allowed these students to receive additional contact lens clinical experience at the university's contact lens clinic.

"CIBA Vision is proud to support this worthwhile event for the second year in a row," said Sally M. Dillehay, O.D., M.S., manager, professional services, CIBA Vision Corporation. "The summer contact lens education program offers students additional positive clinical experience beyond the normal academic year."

Polymer Announces New Appointment For Jane Beeman

Polymer Technology Corporation (PTC) has announced that Jane Beeman, COA, FCLSA, has been appointed to serve on the National Contact Lens Examiners (NCLE) Board of Directors. Beeman, professional services manager at PTC, is a certified contact lens technician and will aid the NCLE in its national certification testing and contact lens continuing education programs.

Beeman has led an active role in the contact lens field for more than 15 years. As professional services manager of PTC, Beeman is responsible for the academic and professional education programs supported by PTC. In addition, Beeman lectures extensively to optometric, ophthalmology, and optician/technician groups and is a frequent guest speaker at leading academic programs.

Corning Bulletin Provides Dispensing Information

1993 marked the ninth year of the publication and distribution of *Dispensing Info*, Corning's bulletin to the optical profession.

Published twice yearly by Corning Incorporated, *Dispensing Info* is an information bulletin which is distributed free of charge to optical professionals, dispensers, assistants and others who provide eyecare goods or services. Its purpose is to provide the most up-to-date information concerning Corning's family of Photochromic lenses, to publish feature articles on current information in the optical industry and to provide details of the advertising, public relations and merchandising support of dispensers of these lenses.

Wesley-Jessen Awards Major Gift to SCO

Wesley Jessen Corporation, the Chicago-based contact lens manufacturer, has awarded a \$50,000 grant to Southern College of Optometry (SCO). The grant represents more than a year of development between Wesley-

Jessen and the college on behalf of SCO's endowment campaign, Share The Vision.

SCO President William E. Cochran, O.D., stated, "This financial support illustrates the strong commitment of Wesley-Jessen to optometric education and the optometric profession. Scholarships generated by their support will play a key role in helping reduce the indebtedness of our students upon graduation."

Wesley-Jessen has pledged the gift over a three-year period to establish the Wesley-Jessen Scholarship Fund. When endowed, scholarships will be awarded to students based upon academic performance and leadership qualities.

Vistakon Supports Professionals With Total Team Concept

In its efforts to support eyecare professionals, Vistakon unveiled Total Team Concept, a practice management program for doctors and staff.

Total Team Concept is a one-day seminar presented to optometrists and staff members that provides useful information to help practices better manage



and communicate with patients.

"With Total Team Concept," said Craig H. Scott, vice president of marketing for Vistakon, "we want to provide that latest information that can help a practice respond to and meet the needs of the patient."

Total Team Concept is presented by Miles and Associates, a consulting firm with 15 years experience in the field of practice management. President and CEO Linda Miles said that Total Team Concept is essentially about communication. "Good communication between doctor and staff filters down to good communication with the patient," she said. "The result is happier patients, which ultimately leads to better patient retention."

ABSTRACTS

Does Problem-Based Learning Work? A Meta-Analysis of Evaluative

Research. Vernon DTA, Blake RL. Acad Med 68:550-563, 1993.

Meta-analysis can be roughly considered the composite statistical evaluation of studies conducted by various individuals on the same topic. These authors apply that concept to the issue of problem-based learning (PBL) compared to traditional teaching methods within medical schools. Since study methods or populations may vary among reports, this integrative approach offers clarified generalizations based on statistical analyses.

Problem-based learning was identified for this analysis as a method of learning or teaching that emphasizes: 1) study of clinical cases, 2) small group discussion, 3) collaborative independent study, 4) hypothetical deductive reasoning, and 5) a style of faculty direction that concentrated on group process rather than imparting information.

Problem-based learning has been instituted in a number of settings as pilot projects. These authors have discovered that disparate outcomes occur on the National Board of Medical Examiners Part I examination (NBME I) when traditional and PBL students are compared. Generally, traditional students performed better than their PBL counterparts. Confounding this generalization, however, is the overall heterogeneity of examination results and the significant differences among programs.

The acceptance of PBL was determined to be uniformly high among faculty and students. Measures of outcomes on faculty attitudes, student mood, class attendance, academic process variables and measures of humanism generally were found to be positive. These intangible and less frequently measured variables are difficult to quantify.

These authors suggest that their analyses generally support the superiority of PBL over traditional methods.

The application of PBL to optometric education is already part of the learning process. Conscious implementation of PBL courses seems to be a step which should be taken cautiously.

Reviewer: Dr. Leo P. Semes
University of Alabama
School of Optometry

Performances on the NBME I, II, and III by Medical Students in the Problem-based Learning and Conventional Tracks at the University of New Mexico.

Mennin, S.P., Friedman, M., Skipper, B., Kalishman, S., and Snyder, J., Acad. Med. 68(8), 1993.

It has been widely discussed that the conventional structured curriculum of most health professions schools may not be the most appropriate method to educate students, considering that clinical experiences and life-long learning depend on the development of more independent, problem-based learning. This paper describes the experiences of the University of New Mexico School of Medicine (UNMSOM) which, in addition to a conventional structured curriculum, has had a problem-based curriculum in place since 1979. The issue under study was the performance of students in each of the two curriculum tracks on the Parts I, II, and III of the National Board of Medical Examiners (NBME).

Analysis of their students' performance showed that those who were in the problem-based curriculum scored significantly lower on Part I (basic science) than did students in the conventional curriculum. There was no difference in

their performance on Part II, and the students who had taken the problem-based curriculum scored significantly higher on Part III.

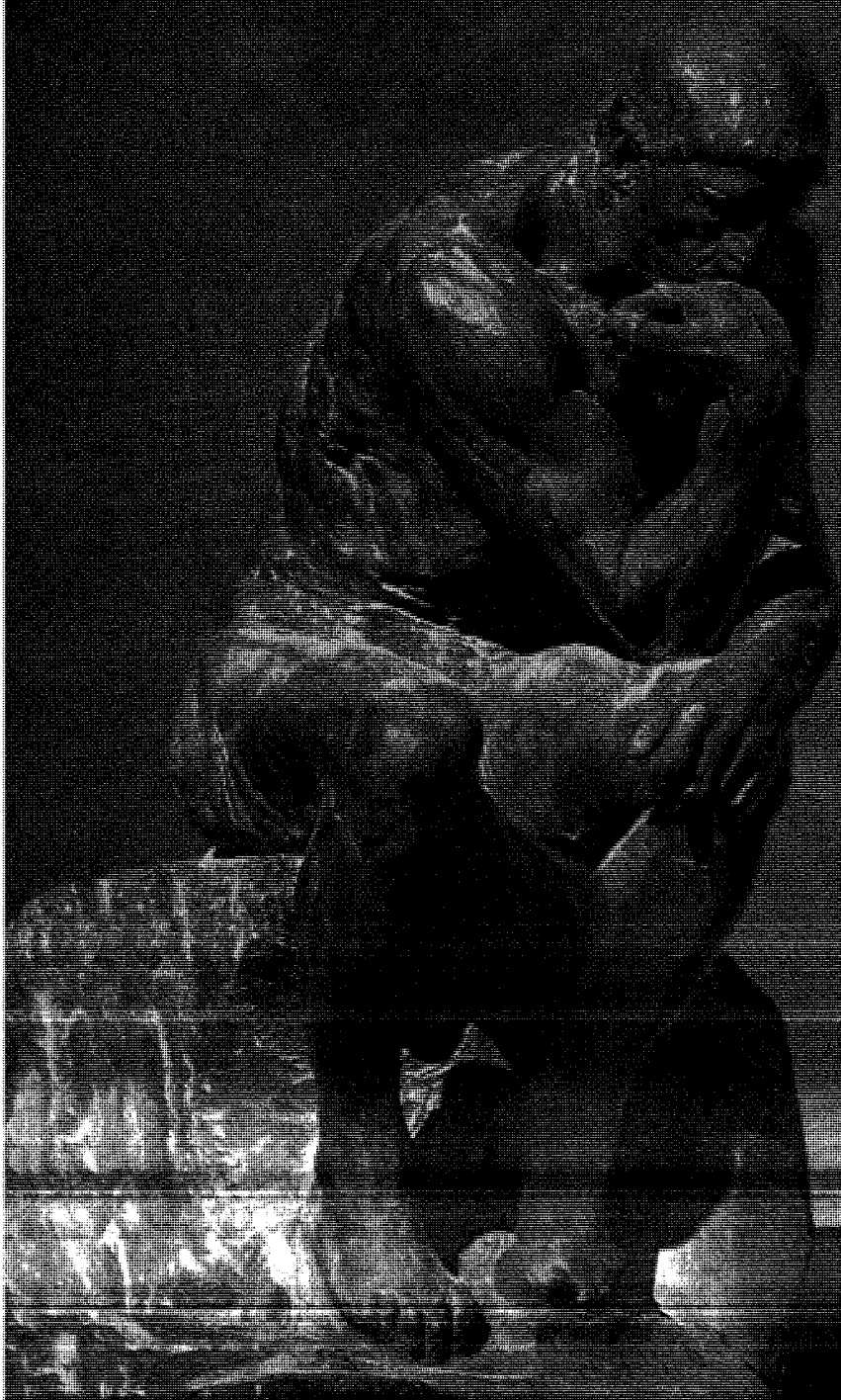
In the UNMSOM model, students were assigned to either problem-based curriculum or conventional curriculum based on a variety of criterion. A group of students who were randomly assigned to the conventional track had the highest NBME I scores and the lowest failure rate. Students randomly assigned to the problem-based track had significantly lower Part I scores and a failure rate 5.7 times higher than students randomly assigned to the conventional track. No significant differences between these two student groups were seen on Parts II and III, but the numbers of students were small.

Other interesting findings from this study include indications that those students with the poorest academic background (MCAT scores and science GPA's) benefited, as indicated by Part I scores, from being placed in a conventional track rather than a problem based track. This was also true for students in the mid-range of MCAT scores. Students with the best MCAT scores and science GPA's showed no difference in Part I performance with regard to whether they had taken a conventional or problem-based curriculum.

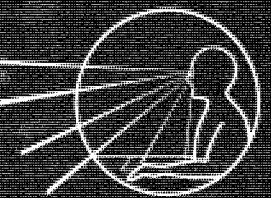
The article suggests ways to enhance student performance on Part I of the NBME, but also suggests that NBME scores may not be appropriate measures of student success. These results are interesting and should be kept in mind as other health professions schools consider moving to problem-based curricula.

Reviewer: Dr. Roger Boltz
University of Houston
College of Optometry

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