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IN THE YEAR 2000

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Association of Schools and Colleges of Optometry

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EDITORIAL

Optometric Education in the Year 2000

Who leads a profession in change? This is a question that too often appears to pit one group against another—young against old, practitioner against educator, the public against the profession. In reality, various segments of a society, at one time or another, take the lead depending upon the circumstances. Public need may demand a change. Cost containment forces change. Technology, research, politics, competition, even leaders eager to press for their own personal agenda can cause a profession to expand or contract, to be modified in one way or another. No matter what prompts change, its effect is felt by all and causes an adjustment by all.

The profession of optometry is no different. The past decade has seen it influenced from within and from forces external and even far removed. As a result, it has been difficult at times to react in a timely and even appropriate fashion. What has been true for the profession has likewise been true for optometric education. Where educators have had reason to introduce change, we have done so. Sometimes, the change was initiated as a result of research and technological advances; other times, change was influenced by legislative, political and professional concerns. It has not been an easy task, given the rapidity of change that we have encountered. No matter what the reason for change, it is critical to the profession's and the public's well-being that the educational base adequately prepare the practitioner to meet the change that is to occur.

It was precisely because of this rapid change and the need to evaluate its impact on optometric education that ASCO initiated a strategic/long range planning process in 1985. It was hoped that through this long range planning process, ASCO would set new directions and goals for optometric education that would carry us into the next century. That process called upon leaders in the profession, education, government, third party providers, and other health disciplines to offer input into health care and optometry during the next 15 to 20 years. From that information, ASCO, in 1986, adopted 10 goals that must be addressed during the next five years in order for optometric education to meet the needs of the profession and the public in the first part of the twenty-first century. ASCO has already begun to address seven of these goals. One of the goals, "Defining Clearly the Scope of Optometric Education," has resulted in the establishment of 25 objectives entitled "ASCO's Strategic Plan for Optometric Education" which has been adopted by ASCO's Board of Directors. This special issue of the *Journal of Optometric Education* lays out those objectives and provides the background that led to their adoption.

ASCO's Board of Directors hopes that this issue of JOE will be circulated widely in order that all might be informed as to what ASCO is attempting to accomplish and so that ASCO can obtain the assistance from all as it and its member institutions seek to be partners with others in contributing to the continuing evolution of this profession. As you read this issue and reflect on the objectives ASCO has set, you will note that several of the items on the agenda require direct cooperation with groups within the profession itself, especially the American Optometric Association, the International Association of Boards of Examiners in Optometry, the National Board of Examiners in Optometry and the individual state boards. But key to accomplishing other objectives on the agenda will be the active and thoughtful involvement of faculty at our educational institutions.

The profession of optometry and optometric education have matured to a point that each and every one of us can be justly proud of the status that has been achieved—we are the equal of any within the health community. Now is the time for all segments of this profession to join together for what lies ahead. ASCO set its goals with the help of others; now it seeks the assistance of others both inside and outside education as it prepares to implement these goals and objectives.

Edward R. Johnston
Immediate Past President
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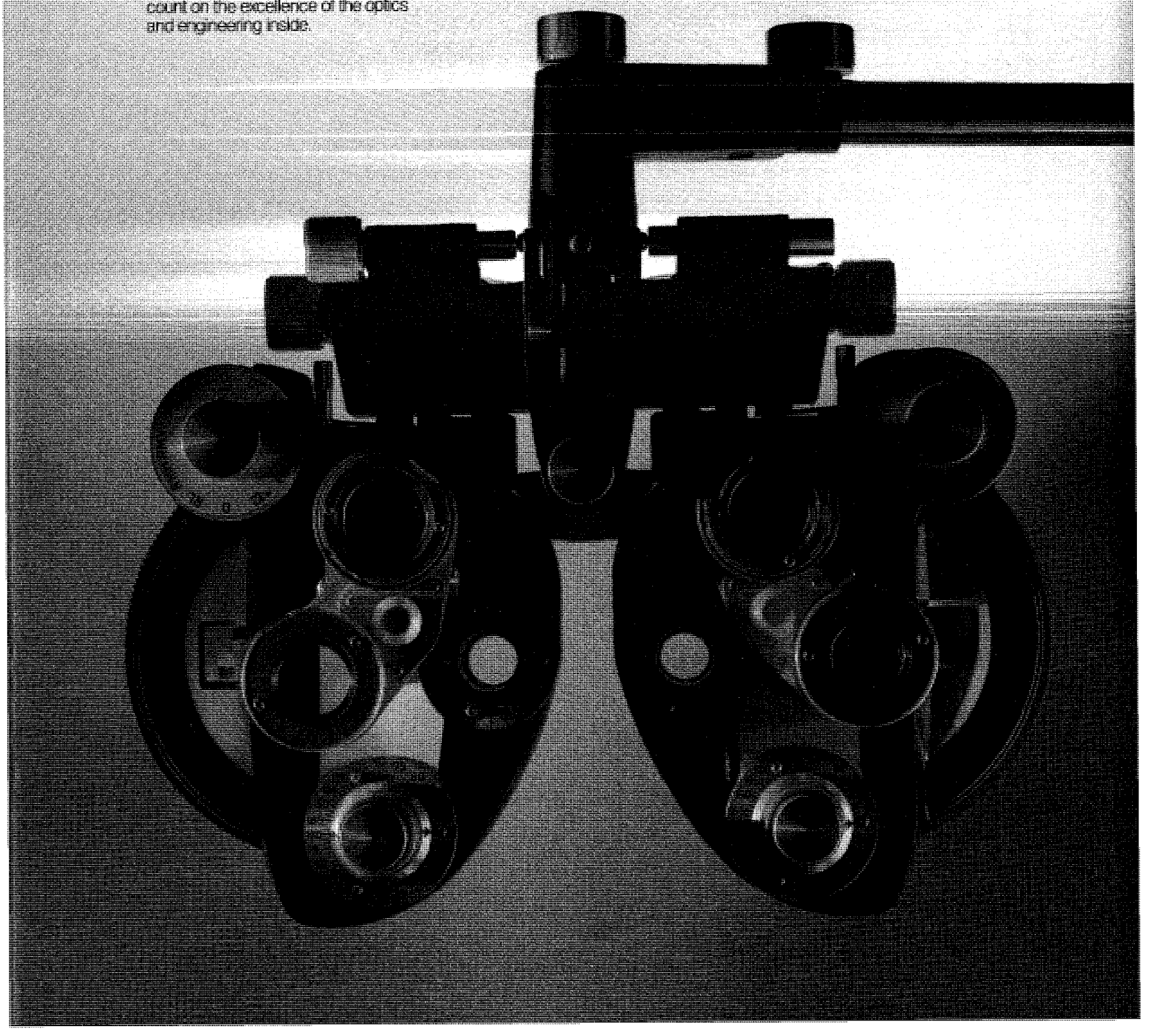
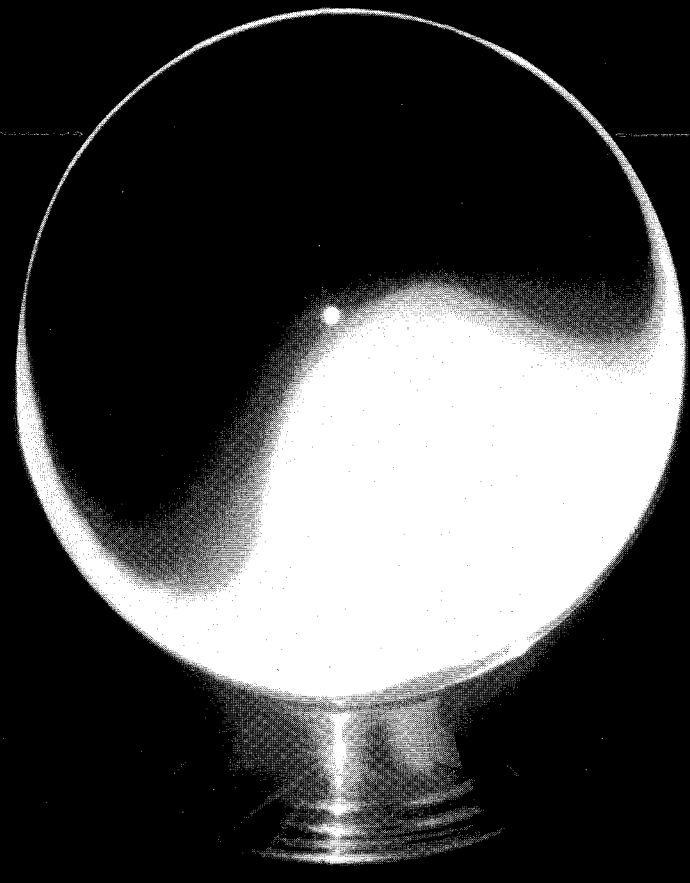


INTRODUCTION

The Scope of Optometric Education

One of the ten goals set forth by ASCO in its "Strategic Plan for Optometric Education, 1986-1991" was to define clearly the scope of optometric education. The implementation of that goal was a priority at the October 1986 ASCO board meeting, when the deans and presidents or their representatives presented papers responding to questions posed by ASCO's executive committee. What follow are a number of those papers, chosen in order to provide as broad a perspective as possible on the scope of optometric education in the year 2000.

After the presentation of their papers, the deans and presidents met in small groups in order to develop a consensus on specific recommended changes that should be made in the optometric curriculum in preparation for the Year 2000 and beyond. These recommendations were ultimately compiled into a document entitled "ASCO's Strategic Plan for Optometric Education—Year 2000" which was approved by the ASCO Board of Directors at its April 1987 meeting in Fullerton, California. The twenty-five recommendations set forth in that document are published in this issue of the Journal of Optometric Education *immediately following the deans' and presidents' presentations.*



The Evolution of Optometric Specialties and Residencies

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

In the formative years of optometric specialties which culminated in the development of optometric residency programs, there was much thought involved in defining what was meant by specialties and residencies. Some people argued that optometry was a specialty and that it made little sense to fragment the profession into smaller parts. There was a fear that we would lose identity and cohesiveness as a profession. Nevertheless specialization attracted numerous adherents and the decision was to proceed, keeping a wary eye out for the difficulties that had been predicted. A strong impetus for specialization in the form of residencies came from the Veterans Administration. Although some of the schools and colleges of optometry and others were actively pursuing the possibility of establishing residencies, it was the availability of funding by the Veterans Administration for residency programs that brought the issue to a head. Optometry commited itself to residencies even though there were still some fundamental issues that remained unresolved.

For example, there was little doubt that a specialty dealt with an optometric topic and that a residency dealt with a program of instruction on that topic. But otherwise there was no unanimity in the definitions that were proposed. In fact, it was difficult even to obtain a consensus. As the discussions proceeded, there were some ideas that most people agreed to use as the basis for subsequent action. They included:

1. An optometric residency should deal with a visual condition that is clinical in nature. It was implied that there would be both a diagnosis and a treatment of a patient's condition that would serve as the basis of all residency programs.
2. There should be an adequate number of patients who have the condition to support practitioners who wish to confine their clinical endeavors to this aspect of practice.
3. A residency should have a solid scientific experimental basis that is confirmed in the literature.

"We can have specialties without residencies. This issue has not yet been directly addressed by the profession."

From these basic tenets, optometry was able to delineate certain subject areas that could be developed as residencies. There were some topics that fit the basic criteria, such as contact lenses and primary care. But even here some people objected to the inclusion of primary care, since, it was argued, a specialty could not include the entire body of knowledge of the profession. There were other topics that came close to meeting all of the criteria, such as binocular vision and low vision rehabilitation. Most of the others seemed to fall short because they hadn't met all of the criteria. In trying to specify which subject areas were in compliance, attempts were made to locate individuals who were already practicing solely in the proposed subject areas. In most instances, the team could identify persons who were devoting a large part of their practices to the subject topics, but almost without fail it was discovered that these practitioners were also involved in primary care optometry or general practice. In other words, they were not truly specialists. They were generalists who had one or more specialties.

I mention this background information since it seems appropriate that we should attempt to build on the existing structure rather than try to reinvent the wheel for the year 2000.

Secondly, we can have specialties without residencies. This issue has not yet been directly addressed by the profession. For example, the profession has a need for people who are trained in practice management/marketing/personnel administration. These areas of training are certainly not covered under the optometry licensing laws, but they are important aspects of the training of optometrists. The training of people in the general areas of management, etc. is currently being done outside of the profession, but it is conceivable that we should be doing some of the training in the schools of optometry to assure the proper relevance to our needs. If we were to start such programs, it would be inappropriate to have them as residency programs. They would not be clinical in

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content. Under those conditions, we would have specialty programs of an entirely different category and probably of an entirely different priority to the profession.

The need for specialty care can be expected to rise. Public health demographers can predict within fairly narrow limits that the number of older people will be increasing steadily during the remainder of the century and beyond. The implication of this information is that there will be a need for optometric care for those vision problems that afflict the elderly. In terms of the criteria that were mentioned previously, it could be that some of the specialties now classified as being borderline because of the lack of sufficient patient demand to engage a practitioner full-time in the practice of those specialties might become viable specialties. It is likely that low vision rehabilitation will benefit from this changing need.

Is it conceivable that our developing technologies will give rise to new optometric specialties? They certainly could and undoubtedly will, but I don't see any new technologies that are likely to be developed to the point of being directly involved in patient care by the year 2000. Every new technology has a rather long gestation period before it matures sufficiently to develop its own niche. Once that niche is firmly established, there is another protracted period during which the newly developed technology is experimented with to determine the best ways of utilizing the newly discovered capabilities. Following that there is a period of expansion in its utilization. One more word of caution, many new technologies give rise not to professional specialization, but to new subprofessional equipment. Computerization is an example of a scientific tool that has been developing at a very rapid rate. The early computers were developed prior to World War II. Their utilization was rudimentary in the field of optics until the latter part of the 1950s. Their applicability in the professional practice of optometry is just now occurring. But how many optometrists are specializing in practice techniques that are based on computer technology? It is true that some have computers in the office, but most of the applications are office management applications that are utilized by the office managers, not the practitioners. Even now, some 50 years or so after the technology was developed, we are just beginning to introduce in very minor ways the use of the computer in patient care.

Are there other areas of practice that might develop into specialties? One aspect of practice that has so far been omitted needs special mention. The scope of optometric practice has been expanding, particularly since the early 1970s when the State of Rhode Island passed a new licensing law that permitted optometrists to use drugs for diagnostic purposes. Now the thrust in optometric legislation is for the use of drugs for therapeutic purposes. It is my contention that the area of drug uses may be the source of optometry's next area of specialization. Our ophthalmological colleagues have already pioneered into several areas of vision care specialization. As optometry grows ever closer to ophthalmology in terms of its activities based on these new licensing laws, there is apt to be more comparability of training than currently exists. Opthalmology has already done much of optometry's work. It has identified needs and developed the scientific literature. What remains is to expand the scope of optometric practice to the point that optometrists will be able to devote all of their practice time to these new areas of specialization. This is not unrealistic, even during the short period of time that we are now considering. The income of ophthalmologists far exceeds that of optometrists (the median income of ophthalmologists in 1984 was $296,000 according to *Optometric Management*). The reimbursement for the treatment of eye disease is thus significantly higher than for non-disease disorders. It is conceivable that optometrists could make a comfortable living with fewer patients if they were to follow the ophthalmological model of practice. This is even more feasible now that optometry is being recognized under Medicare. Once this pattern begins to be established there will be numerous candidates for educational programs in eye treatment in such specialty areas as anterior segment, retina, and neuro-optometry.

"What remains is to expand the scope of optometric practice to the point that optometrists will be able to devote all of their practice time to these new areas of specialization."

It wouldn't be surprising to see the optometrists who are now involved in contact lenses be in the forefront of this new wave of optometric care. They are comfortable dealing with problems of the anterior segment and are accustomed to dealing with various pharmaceuticals, i.e.: contact lens solutions. The step between dealing with corneal involvement resulting from contact lens wear to corneal involvement from other types of insult such as disease is not great. The reason for considering this as a likely possibility for optometry's next phase of residency expansion is that it would take relatively little in new facilities to take optometrists from where they are now to the point where they could provide this type of service. It probably has fewer drawbacks in terms of bad patient outcomes than most other ophthalmological based specialties. Therefore it would not incur unusual malpractice risks and liability insurance costs. It could also be expected to benefit from referrals from optometric colleagues who would prefer to send patients to optometrists rather than to ophthalmologists.

In summary, optometric specialization resulting in residency training may benefit somewhat from the aging of the population, thus producing additional need for specialty care. However, the technology that is currently being introduced into the field of vision care is unlikely to produce major changes in optometric practice by the year 2000. The major area of practice destined to benefit from the rapid changes occurring in the profession is in the field of therapeutic treatment of eye disease. It is likely that before the century ends there will be optometrists being trained in various specialties, patterned after those now existing in ophthalmology. Among the more likely of these is an optometric specialty in anterior segment disease. □

The Finite Optometric Curriculum

Jerry L. Christensen, O.D., Ph.D. and
Edward R. Johnston, O.D., M.P.A.

Introduction

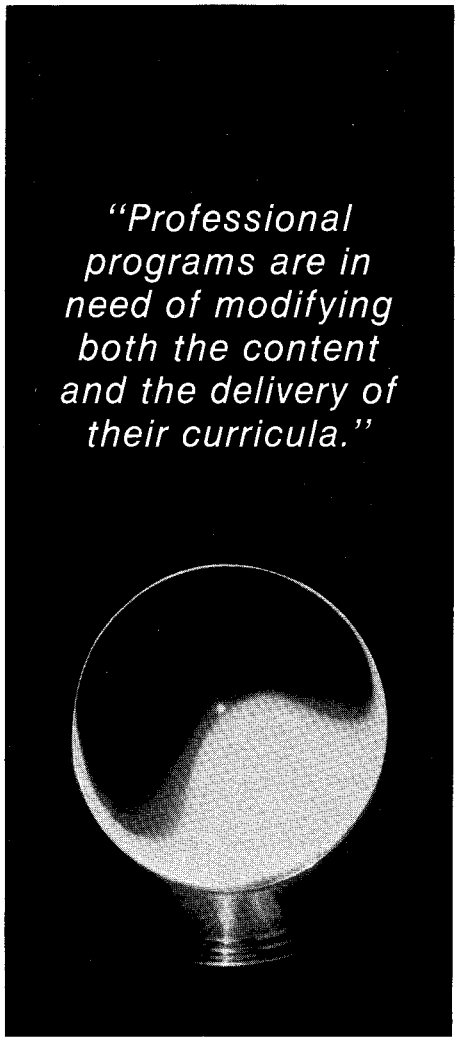
The onslaught of new information and technology is overwhelming and will continue to increase for the foreseeable future. The sheer volume of facts and data that is generated from research investigation and clinical experience is enormous; too much to be incorporated into the professional curriculum, especially in lecture format, and far too much for the student to effectively assimilate. Professional programs are in need of modifying both the content and the delivery of their curricula.

Health professions' educational programs have evolved in part on the basis of what is the most expedient for the educator and not always for what is the most effective educationally. The evaluation of students has been largely on the basis of their ability to memorize; correspondingly, instructional methodology has been selected to suit these evaluation techniques. Optometrists are even licensed by measuring factual recall, even though the practice of optometry calls for critical thinking and problem solving abilities. Compounding this is the fact that we expect the practitioner to be as knowledgeable and capable 20 years later as they were shortly after graduation.

The Problem

There are a number of factors contributing to the problem of too much material to be effectively included in our educational programs. The root causes of this problem are several:

1. The information and technological explosion is a major factor contributing to the overcrowded curriculum.
2. The optometric profession is enlarging its scope of practice which necessitates added coursework in both the basic science and clinical portions of the curriculum.
3. As the problems of society change, the content of the educational programs of the professions change.



A good example is the addition of significant time spent on geriatric optometry. This is as it should be, since the professions originally developed to solve society's most pressing problems, but these additions none the less create stress on the system.

For purposes of discussion, let us assume that optometric education has four basic functional components: cognitive knowledge, basic skills, socialization, and preparation for lifelong learning. Let's examine the effect of the overcrowded curriculum on each of these elements.

Cognitive Knowledge

The information explosion has had the most direct impact on this portion of the curriculum. In addition the increased scope of optometric practice has placed great demands on this curricular component. The informational content of the basic science, visual science and clinical courses has expanded greatly and will likely increase at an even faster rate. It is becoming very difficult to fit the material into a four-year program.

It has long been a dilemma as to how much professional educational programs should emulate graduate study. Professional education must encompass both a certain body of knowledge and a spectrum of skills that every optometrist must have to practice successfully. In addition, it must be insured that profes-

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sional students assimilate the theories, principles and methods to develop the mental skills necessary to make themselves lifelong learners. Consequently, there is tension between: thinking *versus* memorizing, independent study *versus* lecture time, electives *versus* required courses, and flexibility *versus* curricular structure.

Optometry has a problem which is unique relative to the appropriate knowledge base and its extent. In the university setting, optometry developed from the discipline of physics. Consequently, its original intellectual base was hard science, with much coursework in optics and physiological optics, which demanded an analytical approach. As the profession has developed, it has moved increasingly into the mainstream of the biologically-oriented health professions. In doing so it has brought with it its own traditional intellectual base and has had to add that base common to the other health care disciplines; not only has this change brought in additional material, but it has required a different form of intellectual activity of our students. The last two decades have seen many basic biomedical science courses added to our programs.

Therefore, for optometry there is the added concern of deciding how much of the traditional subject matter should be retained and how much of the new basic health science (anatomy, physiology, histology, microbiology, pathology and pharmacology) should be added. How to "shoehorn" all of the essential material into the curriculum and how best to teach it has been the subject of many recent curriculum meetings.

Basic Skills

The knowledge explosion and the increased scope of practice both have caused stress on this element of professional education. Along with the increase in knowledge has come a technological boom which has affected the basic skills necessary to become an optometrist. Techniques, equipment, and ophthalmic materials, such as contact lenses, are all rapidly changing and must be accommodated in our educational programs. That the expanded scope of practice increases certain necessary basic skills is obvious, while at the same time other skills not requiring professional judgment can be delegated.

Socialization

This portion of the educational program is intended to affect and develop attitudes and values. Interest and information relative to these areas is also increasing. The major consideration relative to this area is that coursework with the purpose of socialization has been added to the curriculum over the past ten years or so. The advent of courses such as public health, epidemiology, interpersonal relations, the doctor/patient relationship, and, more recently, expanded practice management, has brought added pressure on curriculum design. The expansion of knowledge and technology has threatened the inclusion of these elements in optometric educational programs.

The overwhelming number of facts must not be allowed to displace the consideration of producing *effective, caring* practitioners as well as knowledgeable and technically sound ones. In medicine the control of the educational process passed from eminent clinicians to scientists during the first 50 years of this century.[1] With the dominance of scientific thinking, and its many benefits, came a corresponding view that subjectivity was to be minimized and decisions and treatment of patients should be based on objective scientific considerations. This attitude changed the practice of medicine. The recent emphasis on socialization and humanism is an effort to restore beneficial elements which were lost. Technology plays a similar but separate role. In a situation with a lot of ambiguity and uncertainty, the health professional can tend to over rely on technology to dictate a course of action, thereby removing the "subjective" element from the situation. Such a course of action is not in the best interest of the patient.

There is good reason to think that appropriate attitudes and values cannot be taught in the classroom alone. Bringing students with the proper initial values into contact with faculty serving as appropriate role models in a facilitating environment is also very effective.

Lifelong Learning

A component of optometric educational programs, which seems to be underdeveloped, is teaching our students to think critically so that they become effective practitioners and can learn-how-to-learn. This is even more important when you consider the consequences of the knowledge explosion. Our students must be taught critical thinking skills so that it is not felt that we must teach them everything in the professional program they will ever need to know.

Possible Solutions

What can be done? Let us analyze the possibilities. If there is more information than can be put into the four-year professional curriculum, the following are possible solutions: 1) the curriculum could be expanded, 2) the curricular content could be reduced, 3) the "packaging" of the material could be improved. The terms expansion, reduction and "packaging" are used in a general sense.

Expanding the Curriculum

1. The expansion of professional school curricula to five years has been suggested before. There are several reasons why this is not practical. The major one is the fact that this would increase the educational costs which are already so high as to have undesirable consequences. Many professional schools have decreased applicant pools. Increasing the length of the program would exacerbate this situation.
2. Residency training could be used for some aspects of professional education which are now included in our curricula. In other health professions, the information boom has resulted in increasing use of postgraduate education and specialization.
3. In a sense, the professional curriculum would be expanded if continuing education were to be employed in a more systematic, rigorous fashion. Certainly, lifelong learning will be a necessity in the future.

Reducing the Content

1. Very careful coordination of the various course elements in the curriculum is imperative. Unnecessary redundancy and duplication should be eliminated. Individual courses may be carefully planned, but unless overall coordination, both horizontal and vertical, is accomplished, the efficient management of information is not being insured. The curriculum should be carefully scrutinized in an effort to insure that the things which are essential are being taught and

that things which are not are omitted.
2. Some carefully selected topics, now being presented to every student, could be taught only as advanced electives. This would require the judicious consideration of the knowledge and skills essential for every optometrist as opposed to those things which would be necessary only for the interested, few specialists-to-be to master.

More Efficient "Packaging"

1. Less reliance on the lecture system is needed and modern, more "time effective," instructional technologies and strategies should be employed to cope with the great amount of information. Utilizing technology to cope with and harness both information and technology is a powerful strategy.
2. Integrated basic science tracks should be considered.[2] For example, it would be possible to have four such tracks of study as follows: 1) structure and function of the human body, 2) vision science, 3) disease, its consequences and treatment, in the human body and the visual system, 4) behavioral science. In each area only the essentials would be taught with the emphasis on critical thinking and problem solving.
3. Our students should be computer proficient. This capability will be important to them in the process of their education. Additionally, they must also be educated as to how to use the computer effectively in practice. The curriculum must be altered to reflect this goal. We should be using computers effectively in our courses and in the operation of our educational clinics. Establishing a "teaching laboratory" as well as setting an appropriate role model in our clinical facilities would be beneficial.

Discussion

A report sponsored by the Association of American Medical Colleges[3], published in 1984, contains a number of issues and recommendations which can be applied equally well to optometric education. The basic assumption of the purposes of a professional education can be rewritten for optometry as follows:

The general professional education of the optometrist aims to enable the student to acquire the knowledge, skills, values and attitudes that all optometrists should have. Vital to these purposes are: a) values and attitudes that promote caring and concern for the individual and society; b) concepts and principles derived from knowledge of natural science, social sciences and the humanities; and c) skills in the collection of information from and about patients.

Significant changes in the curriculum of our educational programs and in the way teaching and learning is achieved will be required to better meet the goal stated above. A major factor in changing both the curriculum and the manner of teaching will be the attitudes of the faculty. A possible obstacle is that few faculty want to see their subject matter area reduced. Many want to reproduce their ontogeny in the classroom, that is, the subject must be approached and covered in the same fashion, order and detail that they were exposed to in professional or graduate school. Some faculty are satisfied only if they can teach at a level that interests or "challenges" themselves.

"A contributing factor to the low esteem of teaching may be the promotion and tenure system of some of our universities which places such a high premium on research and relatively little encouragement to excellence in teaching."

Creating a climate in which faculty find self-satisfaction in meeting the challenge of improving teaching and the curriculum is very important. Coupled to this is the fact that curricular reform and improving teaching requires much effort. Teaching is regarded by some as something to "put-up-with" and is judged to be a low-order activity. Altering the curriculum will be to little avail unless good teaching is encouraged, valued and rewarded. Information on teaching in the form of workshops and seminars should be available to faculty, especially those new to education. Like others in higher education, optometry faculty are *trained* to do one thing, clinical work or research, and then *hired* to do another, teach.

A contributing factor to the low esteem of teaching may be the promotion and tenure system of some of our universities which places such a high premium on research and relatively little encouragement to excellence in teaching. A preoccupation with research, with its attendant technologies and never-ending stream of information, may have produced a faculty and an environment which is influencing our educational system in a manner which had not been planned.[4] It is not being suggested that research be curtailed, but that a better way to accommodate and appropriately utilize both good researchers and teachers in our programs be developed. Excellence in research must be maintained while also making it possible for talented teachers and clinicians to have successful careers in optometric education. Additionally, these individuals must be allowed to be in positions of influence relative to our educational programs. It is a challenge to the administrators of our schools and colleges of optometry to seek a means to achieve a favorable balance between teaching and research.

Recommendations

1. Optometric faculties must limit the amount of factual information that a student is expected to memorize and emphasize the concepts and their application. It is unrealistic and unnecessary to assume that all facts should be memorized and retained.
2. A core curriculum should be established for the O.D. degree. This is to be identified as the level of competence required of all graduates; that level at which the O.D. can be regarded as a primary-care optometrist.
3. Specific instructional and behavioral objectives should be developed and clearly stated. These should identify what is expected if one is to successfully complete each course and to graduate.
4. Emphasis should be placed upon critical thinking and problem

solving.[5] To accomplish this lecture hours should be reduced; educational techniques which foster critical thinking should be adopted[6]; unscheduled time should be provided to permit independent, directed study; evaluation procedures should emphasize critical thinking and problem solving; and computers should be utilized as a means of retrieving information and for problem solving. In short, we must *teach* our students to think critically—not merely *expect* them to. An important skill which optometrists must develop is learning to deal with ambiguity. Data collected from the examination process is not always consistent; yet, a course of treatment must be chosen. Critical thinking skills are essential to this ability.

5. Faculty development programs should be offered to familiarize them with techniques which promote critical thinking.
6. Better integrate basic science and clinical education in order to enhance the learning of key scientific principles and concepts and to promote their application to clinical problem solving.
7. The Association for the Schools and Colleges of Optometry should establish "track committees" made up of faculty who will be charged with: a) defining core tracks and behavioral objectives for each, b) recommending teaching/learning approaches most conducive to achieving these objectives, c) recommending evaluation techniques for providing feedback about achievement, d) provide examples of things which the student should and should not be expected to memorize, e) identifying subject matter which is no longer relevant, and f) identifying those things which should only be a part of residency training.

Summary

The establishment of behavioral objectives, a core curriculum, effective methods of course delivery, appropriate evaluation techniques, and critical thinking as a primary objective of our educational programs will go a long way toward producing the type of optometrist who will be competent, effective, caring, and prepared for the future of the profession. □

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Scope of Optometric Practice: Trends, Portents, and Recommendations

William R. Baldwin, O.D., Ph.D

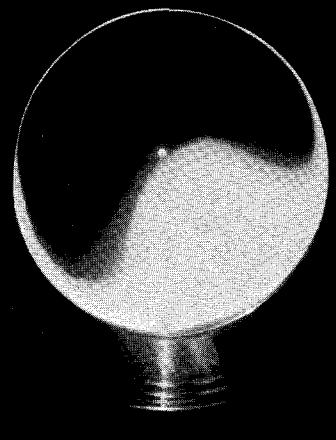
At best we can make only informed guesses concerning how optometry will be practiced in the year 2000 because we can neither control all the forces nor predict the direction of current trends that will determine our future. We can, however, describe present parameters of optometric practice and identify those trends that have had greatest impact in determining its scope.

Present Scopes

Optometric practice cannot be divided neatly into discrete categories with respect to scope. The range of services extends from merely sight testing to a full range of diagnostic and treatment procedures, including those designed to enhance visual performance or cure ocular disease and assess some aspects of general health. All optometrists determine the refractive state of the eye and prescribe glasses. Most add the dispensing of eyeware and evaluation of ocular health; this latter service may range from cursory to circumspect. Often other services are added selectively, i.e. sphygmomanometry may be added to the armamentarium of an optometrist who employs few other procedures beyond those that determine refractive state. Given that individual practices may exhibit such incongruous combinations, at least four general practice models can be identified:

• **Narrow Scope Optometry** — determination of refractive error and sale of spectacles. Optical dispensaries may be an integral part of the enterprise or located in an adjacent facility. Most of these practices include some diagnosis and treatment of binocular dysfunctions and at least a limited evaluation of ocular health. The O.D. usually performs all of the technical functions in such a practice unless it is geared to high volume spectacle sales.

"Optometric practice cannot be divided neatly into discrete categories with respect to scope."



• **Broad Scope Optometry** — assessment of a broader range of visual functions and more thorough evaluation of ocular health. There is considerable variation in diagnostic and treatment methods but the limits on scope of practice are similar. Diagnosis and treatment within the full range of visual dysfunctions and enhancement of visual performance identify this scope of practice. More extensive ocular health assessment also typifies broad scope optometric practice. When active ocular or systemic disease is discovered or suspected, patients are referred to ophthalmologists or other physicians and are not likely to be returned to the optometrist for follow-up care. Optometrists who practice in this manner usually maintain their own dispensaries and more often employ a technician.

• **Primary Care Optometry** — traditional optometric scope may be narrow or broad; the term, full scope primary care, has been used to distinguish and to promote provision of the most complete range of services. Added emphasis of primary care is on diagnosis of ocular and systemic disease and

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other conditions which adversely affect the patient's welfare. General health assessment and health counseling are limited to those conditions that have significant prevalence among optometric patients and which optometrists are competent and equipped to evaluate. When ODs who practice in this manner discover ocular disease they make a decision to monitor, to seek consultation, or to refer. In those states in which the law permits, primary care has been expanded to include specific diagnosis and direct treatment of certain anterior segment pathological conditions. It is likely that legislative efforts will continue until the remaining states pass similar legislation. Fewer primary care optometrists dispense spectacles; most employ more than one technician, and many are found in HMO and other group health practices. Full scope primary care optometry represents the preferred model for independent free standing optometric practices, and the educational goal of most optometry schools.

• **Specialty or Limited Practice** — a few optometrists limit their activity to a special aspect of visual care. Some are based on patient characteristics, i.e. children, the elderly, or hospitalized patients. Others may focus on problem areas, i.e. environmental vision, low vision, sports vision. Others serve special limited roles in a group setting, i.e. employment in an ophthalmological practice or team member in a group practice.

Significant Trends

• **Education** — changes in optometric education have been in part reactive to other trends and in part responsible for the increasing number of ODs who become primary care practitioners. There is some evidence that the trend towards broader scope optometric care, which increased from 1900 until recently, may have been reversed by emphasis on diagnosis and treatment of ocular disease and health assessment. If true, this is an outcome that should be reversed, but without de-emphasizing other aspects of primary care.

• **Legislation** — state drug legislation produced a major influence on the successful movement of optometry into primary care. Federal legislation permitted optometric education to increase emphasis on clinical training and health sciences. Federal laws affecting health care are also responsible for the overproduction of opthalmologists and other medical and surgical specialists. Withdrawal of federal support for health education has created a new trend towards fewer residencies in ophthalmology and other specialties, and to an impending crisis in the financing of health professions education.

• **Technology** — new instrumentation has produced opportunities for optometrists to gain more diagnostic information by means of noninvasive tests; and changed patterns of ophthalmological practice, producing a trend towards subspecialization and placing more and more ophthalmic surgery in the hands of fewer and fewer opthalmologists.

"Full scope primary care optometry represents the preferred model for independent free standing optometric practices, and the educational goal of most optometry schools."

• **Health Care Financing** — it is anticipated that most patients will soon be members of health care plans which contract for health services, reflecting culmination of a trend that began more than two decades ago. Under this arrangement patients often will have little choice in selecting their doctors. This has created concern and confusion among those who have practiced in traditional modes.

• **Health Care Marketing** — Federal Trade Commission actions and third party contracts have created two emerging trends in marketing: expansion of corporate acquisition of ophthalmic dispensaries associated with adjacent optometric practices, and the association of independent ODs in groups developing liaisons with ophthalmic surgeons in closed loop eye care units, and with HMOs, which attempt to contract with third party payors. These trends have produced an increased number of optometric practices associated with corporate owned dispensaries, more ODs who are employed by ophthalmologists, more ODs employed in HMOs, and probably fewer ODs in independent practices. The number of solo practices is almost certainly decreasing. Two factors contributing to these trends are the increasing indebtedness of optometric graduates and the increasing salaries offered by employers of ODs.

Alternatives and Predictions

There is competition for optometrists among three practice modes. If *corporate* dispensaries continue to expand, more ODs will become associated and the scope of optometric practice is likely to become more narrow. Primary care emphasis can be expected to decline. If *ophthalmologists* continue to employ ODs in increasing numbers, these are also likely consequences. An added possibility in this event is that ophthalmological residencies, rather than being sharply reduced in number, will be divided into medical and surgical specialties. Optometry then would be likely to revert to a technology oriented career, generating lower incomes. The effect would be to cause constriction of the optometric curriculum, and less training time would be required.

If *HMOs or groups* comprised of independent ODs and ophthalmologists gain prominence as contractors with third party payors, emphasis on primary care and health science will continue and optometry will finally emerge as a truly distinctive health care profession. Conversely, continuing curriculum emphasis on these areas will help ensure the expansion of this practice modality.

It is likely that all foregoing modes of practice will coexist with autonomous private practitioners in the year 2000, but there will be a trend towards predominance of one. Which one predominates depends on the wisdom and energy with which each is pursued and on the quality and cost of care which each yields.

Another important factor responsible for the current and future status of optometry with respect to various scopes of practice is the quality of actions of the organizations that represent the profession. If a consensus is reached and wisely and energetically acted on, independent primary care optometry will grow and prosper. This can be predicted if the following is accomplished:

- Maintain and expand emphasis on education for primary care while reinforcing and (through research) adding to knowledge of traditional optometric diagnostic and treatment procedures.
- Develop and deliver a post graduate clinical training program to certify the continuing competency of ODs in total primary eye care.
- Continue PEP programs in improvement of practice management and administration skills.
- Develop a nationwide network of community wide groups of independent optometrists, each allied with an ophthalmological service center which provides the full range of secondary eye care and which has access to tertiary care.
- Develop a nationwide marketing system to create contracts with third party payors.
- Develop a computerized information network among ODs, ophthalmological service centers, independent ophthalmic laboratories, and optometry schools.
- Support those independent ophthalmic laboratories which place emphasis on high quality ophthalmic materials and workmanship.

Specific Curricular Recommendations

1. Change the present teaching emphasis towards skills in the performance of historical test procedures—the essential purpose of which is the accumulation of data; reduction of time given to repetitive drill; new emphasis should be placed on developing the quality of professional judgment including problem analysis, diagnosis, and follow up aspects of treatment rather than the performance of test skills.
2. Provide greater exposure to patients who suffer a broad range of conditions in the company of experts who have broad experience with patients who exhibit these conditions. Longitudinal study and evaluation of individual patients is particularly desirable.
3. Emphasize academic training in management of general medical (family practice) diseases and disorders, including all those that commonly affect patients who visit optometrists.
4. Create the following as curricular units and include the development of attitudes as part of the behavioral objectives of each.
   a. Ethical and legal parameters and responsibilities of direct patient care and counseling.
   b. Newest technological advances.
   c. Effective use of allied optometric personnel.
   d. Concepts addressing quality assurance, utilization review, and cost effectiveness.
5. Increase emphasis on clerkships (external rotations) which provide special patient populations and interaction with other primary health care practitioners.
6. Expand post graduate clinical education at sites with adequate quality and quantity of patient material. This should lead to certification with recognized designation of proficiency in a specialty.
7. Provide graduate competency assessment of optometrists in family practice as well as in specialties. Curricula in schools must become a segment of lifetime learning.
8. More formalized post graduate clinical education in residencies leading to specialty certification and in family practice to help insure continuing competency.
9. Encourage ODs to enter graduate programs in vision sciences, in other science disciplines; and in public health, health administration, business administration and biotechnology.
10. Reorient teaching and learning methods. Learning stations will emerge, perhaps in home environment. Artificial intelligence of computers will afford problem modeling and patient simulation with almost unlimited variables to supplement patient contact. Optometric education should culminate in providing optimal educational exposure of students in an ideal practice environment which brings together state-of-the-art instrumentation, highly qualified preceptors, and properly trained support personnel in a model practice. □

ASCO Awarded Grant from Administration on Aging

The Association of Schools and Colleges of Optometry (ASCO) has been awarded a grant from the Administration on Aging, Department of Health & Human Services, to enhance the ability of teachers and students to serve the vision care needs of the aging patient. Instructional objectives in optometric gerontology, an interdisciplinary optometric gerontology course, evaluation strategies, a model for geriatric clinical experiences and training for optometric faculty will be developed and disseminated. Three workshops will be presented to optometric faculty at various regional locations. It is expected that approximately 130 faculty members will be trained in optometric gerontology and that 1200 optometry students annually will receive the benefits of this training. The grant is for $184,210 of which the federal share is $137,595 with the remainder being contributed by ASCO. The grant period is from September 1, 1987 to January 31, 1989.

The New Technology and the Optometric Curriculum

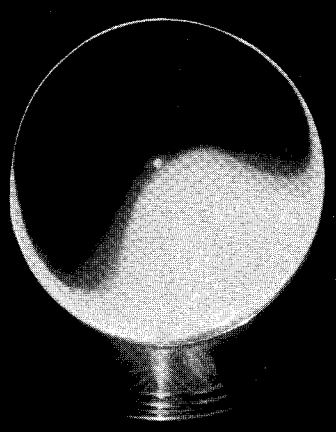
Darrell B. Carter, O.D., Ph.D.

It is a reckless decision to make predictions about the future. Several books have been printed containing predictions that proved to be completely wrong with the passage of time. Among the most noteworthy were the strong statements by U.S. Naval experts before World War II that airplane bombings were highly unlikely to ever sink a battleship and the statement by the U.S. Secretary of Commerce in 1948 that Japanese-made automobiles would never sell in appreciable quantities in the United States. There are many more such examples of seemingly obvious predictions that proved to be quite untrue.

An example of an incorrect prediction in optometry was the one by many leaders of our profession during 1948-1950 that national health insurance would be adopted within five to ten years. After having said the above, I will venture several predictions regarding optometry and technology and will make some recommendations.

The most obvious prediction is that the recently introduced technology in vision care—rapid instrument determination of refractive error, computer evaluation of visual fields for early detection of ocular disease, extended-wear contact lenses of several different materials, radial keratotomy, intraocular lenses for aphakia, laser therapy for both open and closed angle glaucoma and for other ocular diseases—will all be improved during the next 15 years. It is reasonable to predict improvement in each of the above areas because each is a matter of further development and utilization of what is basically present technology. In all of these areas progress is still occurring.

"Technological advances and others that occur may substantially modify optometric practice but not revolutionize it."



Some other widely predicted advances in vision care are probably less likely. The development of much more efficient new drugs for the treatment of eye disease will likely still be confronted with the usually nonretractable nature of age-related deterioration of the human body and with the great ability of microorganisms to develop resistant strains to new pharmacological therapeutics. For example, it is certainly possible but unlikely that a pharmaceutical agent without unacceptable side effects will be developed to reverse or prevent presbyopia.

It is my belief that the above technological advances and others that occur may substantially modify optometric practice but not revolutionize it. However, it is impossible to precisely predict the exact form of these modifications. Actually, these can occur as modifications of individual practices in nonparallel ways. Urban and suburban optometry will have three types of practices—commercial large establishments; HMO connected practices with several optometrists each and many ancillary personnel; and private practices with one, two or three optometrists. Rural and isolated small city optometry will likely remain much as today—one or two optometrists using improved technology but still offering a wide scope of optometry with payment partially private and partially third-party insurance.

The differences among these three basic types of practice may become so definite that they will be represented by

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three different optometric associations. For example, it may well be that only the optometrists in private practice will treat ocular disease. The optometrists of large commercial establishments may not treat disease because of the large malpractice liability and because of their need to see patients very rapidly. The HMO optometrists in many HMO groups may as standard practice refer ocular diseases to a medical section of the HMO.

The most important skills needed by our graduates will not be how to use each of the new "gadgets" but rather how to successfully fit into at least one of the several available modes of optometric practice. With the coming changes in optometric practice it will be more important than ever for our schools to select students who have already demonstrated the qualities of adaptability and perseverence, and it is more important than ever to offer as broad and basic an education as possible. Applied business courses and personality/psychology courses may be more important than the intensive study of each of the many computerized visual field testing instruments.

Some optometrists and optometric educators fear that new technology will make unneeded the optometrist's basic services of vision examination and the supplying of optical devices. Those with these fears from time to time suggest that optometrists substitute vision training, industrial illumination, management of learning disorders, treatment of ocular disease, etc. While all of these are worthwhile in themselves, they will not maintain the profession of optometry nor the existence of our schools of optometry. If the optical basis of optometry becomes partially or totally obsolete, our profession will become obsolete to the same degree. However it is unlikely that vision analysis will become obsolete and thus optometry will likely continue to exist and probably flourish.

While the strong trend towards therapy of glaucoma and anterior segment ocular disease will be greatly beneficial to optometry with regards both to prestige and to coverage of optometric services by Medicare and insurance programs, the major portion of the income of optometrists will continue to be generated by refractive examinations and the supplying of optical devices.

The new technology is unlikely to render obsolete the need to examine, "to lay on hands," and to explain the patient's visual problem. Whether the refractive error is determined by use of trial lenses, by use of a phoropter, by use of a retinoscope or by use of an advanced technology autorefractor does not play an overpowering role in the real optometric service delivered to the patient. With any one patient, one refraction technology may yield better results than another and probably all will continue to be used. The same will hold true for technology of visual field testing.

It should be noted that new technology usually adds to the scope of optometric practice. Certainly, soft and gas permeable contact lenses have added greatly to optometry. The current rapid development of computer assisted visual field testing devices will likewise extend the optometrists' ability to detect and manage ocular disease.

A major consideration in the structuring of our curriculum is that the current trend to assuming a much greater role in the treatment of ocular disease will not go unopposed. Even with the great oversupply of ophthalmologists in the U.S. today there has been only a slight reduction in the number of ophthalmology training programs. Most of these excess ophthalmologists are by necessity conducting practices resembling those of optometrists. The marked increase in the supply of physicians of all specialties makes it unlikely that the excess ophthalmologists will switch to other areas of medicine. I believe that it is safe to predict that the economic competition from physicians will increase.

An even greater increase in economic competition is likely to result if the economy of the U.S. turns sour. For the most part, the U.S. has had a prosperous economy for the 40 years since the end of World War II. This is one of the longest periods in U.S. history without a major panic or depression. A definite depression might well bring more physicians into optometry-like practice by reducing the effective demand for other medical services. Certainly competition among all providers of vision care would increase in intensity and viciousness.

The changes in optometry that will occur suggest that the programs of our schools of optometry should be reviewed for appropriateness and lasting worth.

Probably the most serious mistake that faculty and administrators of the various optometry programs can make will be to tailor their programs to meet student desires for extensive training in current technology and medical and ocular disease treatment while at the same time neglecting education in optics and refractive examination and diagnosis.

There is, however, a different danger in molding our curriculums. Knowledge is becoming increasingly specialized and more fragmented. It is more and more difficult to relate discrete blocks of knowledge to larger and more significant dimensions of understanding. The specialist scientist teaching in his/her area of specialization too often teaches in a manner that does not integrate with other knowledge. The great need is to teach the ability to assimilate new knowledge and to integrate it with previous knowledge. This is a critical but difficult task for the faculties of our institutions.

I realize that the curriculum implications of the above thoughts are not in accordance with the wishes of the majority of students. Most students do not wish to be forced to think. They do wish to have all instruction presented in a well-organized format requiring only regurgitation upon demand. Being forced to reason or to evolve their own explanation results for most students in an indictment that the instructor is guilty of "poor teaching." Most students like a "what and how" mode of instruction; they are not pleased with a "why" mode.

Yet the development of a "why" approach to new situations will more likely give our graduates the flexibility they will need to meet the coming changes in optometry. We cannot with high probability predict what changes will occur, but we can with certainty predict change will occur.

Students with a strong background in physics, optics, biology, normal and pathological human physiology, biochemistry, visual science, and optometric science will have a much greater probability of learning the proper and most efficient use of a new instrument or a new therapy than one who has had extensive training on a current but soon to be obsolete instrument. To assure the future of optometry and the success of our graduates as optometrists, the schools must develop curriculums that give a strong science and technical basis for further learning and which also develop strong business management and "people" skills. □

Projected Changes in the Health Care Delivery System

Sylvio L. Dupuis, O.D.

Beginning with the implementation of the social contract of the 1960s, and marked by the passage and implementation of Medicare and Medicaid, the health care delivery system began to change rapidly and radically.

Medical health care system changes began to produce a bundled system of health care delivery where size and centralization became the primary issue. The hospital, in effect, became the physician's "little black bag."

The primary cause of this phenomenon was the separation of the patient from the issue and the impact of cost. The phenomenon was further accelerated by the social contract issues that made health care for all Americans a right, not a privilege, and made equal availability and access to quality care a right of all Americans regardless of ability to pay.

Under this concept, more always seemed better and bigger and more high tech always seemed the preferred options. Quality was equated with expansion, specialization and instrumentation. Laboratories in physicians' offices virtually disappeared and office-based minor surgery in medical and dental practices was moved to the hospital. The house call disappeared and was replaced by the answering service, the beeper and the 24 hour per day full service emergency room manned by trained emergency room physicians. By the early- to mid-seventies, the transition was nearly complete and the system almost totally *bundled* and *medically controlled* in the typical physician oriented hospital. The hospital needed the volume generated by physicians to fuel its expansion plans and thus we entered the age of physician *recruitment*, an active effort to bring more well trained and highly specialized physicians to the hospital medical staff. And why not? Competition where price is divorced from the equation becomes a competition where size and scope of services are the dominant issues. This change created a system where more physicians filled more beds, where more specialization and more technology brought more prestige and an expanded share of the market, and where expanded market share fueled demand for larger and more modern facilities.

All seemed well across America where more always seemed better until the late sixties when rapidly escalating costs began to sound an alarm in Washington. So began the era of *health planning*. Early on, it was called regional medical planning and comprehensive health planning with State "A" agencies and Regional "B" agencies through the advent of P.L. 89-749, "The Partnership for Health Legislation," which brought us *S1122 review and a plea for* the system to regionalize, to plan together, to consolidate and to share. This planning took place in an environment where the real rewards came from growth and expansion of services with enhanced prestige and greater market share the predictable outcome.

President Nixon attempted to combine health planning and regional medical planning administratively; failing that, he pushed through enactment of P.L. 93-641, the National Health Planning and Resources Development Act. The Act established local and regional Health Systems Agencies (HSAs), State Health Planning and Development Agencies (SHPDAs) and State Health Coordinating Councils (SHCCs) to implement the "Certificate of Need" program. Again the focus was on the supply side calling for cooperation, consolidation and regionalization. P.L. 93-641 was an attempt to rationalize the health care delivery system, to *control costs* through planning for and delivery of scarce health care services.

In an era where *demand* was being fueled by business, industry, and unions who were joining together to offer an ever increasing range of health benefits and at a time when marketing, positioning, high technology, and expansion were the watch words, the system of regional planning and cooperation was destined to fail. As a point of fact, the system is terminally ill and is in its final stages of dismantling.

What's new and what's happening? *What's new is that a new question* began to be asked in the early eighties. What's new is that the system ran out of fuel (money) and that the system stopped asking, "Is it reimbursable?"

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and instead began to ask, "How much does it cost and is there a more cost effective way of rendering the serivce?" This seemingly simple event triggered an enormous avalanche and revolution in our thinking by switching the focus of our thought from the supply side to the *demand* side as we finally came to recognize that the supply of services would not continue to expand if the demand was shrinking. How do you control demand? You do so through second opinions for elective surgery, by introducing pre-admission testing to reduce hospital stays, by adding incentives to make ambulatory surgery and ambulatory care and ambulatory lab services more attractive. You do so by adding gatekeepers, case managers, managed care, and deductibles and by promoting HMOs, IPAs, PPOs, etc.

The net result of these initiatives has been an extremely rapid unbundling of the hospital-centered medically dominated health care delivery system—and therein lies the challenge and opportunity for our profession and our educational system. These revolutionary changes have moved us from the periphery of the system into the mainstream of the health care delivery system. When cost and cost effectiveness rise to the top as issues, we can compete most effectively. When market share in a decentralized system becomes significant, then our control as a primary point of entry into that marketplace becomes very important.

Our challenge as a profession is to seize the opportunity, to press our advantage in the marketplace. Our challenge as educators is to prepare our practitioners for the successful professional practice of optometry in the 21st century. I will leave to other, more experienced academicians, the challenge of developing the specifics of the new curriculum, but let me at least suggest a title "Preparation For Life."

Our new curriculum must deal with the history and evolution of our health delivery system. It must study our changing health care environment. It must teach planning and decision making options and alternatives. It must examine the development of health delivery systems' options and the benefits and shortcomings of each. It must also deal with the critical issues of management, financial planning, market positioning, and administration as well as the skills of self-reliance and entrepreneurship. Finally, and more critically, it must prepare our students to deal with the professional and moral obligations that will arise as the scope of our professional services continues to change.

I am confident that our educational system does and will continue to provide our students with the technical skills required for the successful professional practice of the profession of optometry. I am equally confident that ASCO and its member institutions can and will develop a total curriculum that will prepare our students for success in all aspects of their lives, including family, religious, professional, political, social and community service. The challenge, then, is to deal with the total person and to raise the individual and collective self-esteem of our practitioners and our profession. The reward will come from graduating a professional person prepared to deal effectively with a future full of opportunity. □

OPTOMETRY 2000

The Basic Sciences in Optometric Education

David A. Greenberg, O.D., M.P.H.

Approximately five years ago the National Board of Medical Examiners considered eliminating the testing of the basic sciences at the national level. The proposal was met by vigorous opposition which seems to have been motivated by parochial rather than altruistic, educational concerns. Departments of basic science in medical schools around the country argued that such action by the National Board of Examiners might readily be perceived as being indicative of a lessened significance of the basic sciences in medical education. Such an interpretation could readily be envisioned permeating the medical schools themselves and, in the extreme, leading to the elimination of faculty and conceivably whole departments.

In my opinion, the National Board of Examiners was pedagogically unenlightened in their approach as it seems that their prime motivation was simply to eliminate testing the full spectrum of basic science courses at the national level—especially testing based upon the regurgitation of interminable facts. Regardless of intent, the educational impact of their proposal could have been tantamount to the proverbial "tossing out the baby with the bath

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water." The Board might well have generated support had its proposal been more precisely focused upon the issue of replacing well entrenched but clearly archaic testing with the psychometrically sound assessment of areas within the basic sciences relevant to clinical care.

I believe that we in optometry are very fortunate in that our National Board of Examiners has, in its new outline and format, shown the insight and pragmatism to follow this latter path. The board has recognized and responded to optometry's need for a shift in testing emphasis within the basic sciences themselves—from the traditional visual sciences, including the full range of optics courses, to the biomedical sciences. In addition, the Board seems to be attempting to test these areas in a manner which should encourage integration of the basic and clinical sciences.

The reweighting was necessary as the contemporary practice of optometry has shifted radically with the profession firmly grounding itself as a true provider of full scope eye care. Increasingly, today's optometrist is responsible for the management of ocular disease and must understand the range of relevant biological principles. This necessity for heightened attention to the biological sciences is further bolstered by the demographics of our population which clearly points toward an increasingly older and hence medically compromised populace. In other words, the optometrist's expertise must include not only mastery of the ocular manifestations of systemic disease but must extend to a true understanding of the pathophysiologic processes of systemic diseases themselves. Our schools and colleges must not respond to optometry's evolution in a manner dictated by convenience—changing course titles and descriptions simply will not do. We must instead accept these changes in the profession we serve, recognize the significant challenge they represent and respond meaningfully. ASCO could play a pivotal role in facilitating this process for its member institutions by developing an updated core curriculum for the basic sciences as it is doing in other areas.

On the subject of a more enlightened approach to the actual presentation of the basic sciences in optometry schools, it is unfortunately still the rule rather than the exception that they are presented as discreet, essentially independent units—not unlike how they might be encountered at the undergraduate level. The result is that students are forced to deal with the all too complex task of wading through a flood of facts to identify and integrate that information which is relevant to clinical care. Complicating the issue is the traditional separation of basic and clinical sciences, an artificial distinction whose unfortunate perpetuation is a blatant impediment to better education in the health sciences.

A logical imperative then for the basic sciences in optometry, or any health care curriculum, should be an unequivocal commitment to their presentation in a manner conducive to enhancing the art of problem solving and, if possible, clinical education directly. One model for achieving this goal of an integrative education would require all those teaching in the basic sciences to hold both basic science and clinical degrees. This approach seems most impractical as a current and future shortage of such individuals is all but certain.

Another potentially viable and far more practical solution would be to secure a commitment from basic science faculty to gain insight into clinical care sufficient to fuel meaningful examination and, if necessary, reorientation of their courses. How are basic science educators to gain this insight? They would gain it through the assistance of clinical educators. Heresy? Not really—researchers and basic scientists, like clinicians, are not always seeking new knowledge but rather are simply seeking answers to questions which seem soluble given perseverance and the application of current knowledge.

Simply team clinicians with basic scientists for the purpose of examining, in concert, the first two years of the professional program. Their task would be to identify those elements of practice that the basic sciences clearly illuminate. However, the pulse of such an approach must be carefully monitored to be certain that enthusiastic input from clinicians does not unwittingly throw off the vital trappings of science.

Without such an effort these courses will continue to be taught as independent, unrelated bodies of knowledge. One consequence of current nonintegrative presentations is that these courses are often presented as discrete entities and at an unnecessarily high level of sophistication—at a level more conducive to encouraging research than to enlightening practice. While this tendency is certainly not a Machiavellian effort to maintain the status quo for basic science instruction, it does have the likely effect of sacrificing a meaningful educational experience for the preponderance of students who do not thrive in such a fragmented educational environment. As a result students are at best being taught facts and certainly not process!

Such unenlightened presentation of the basic sciences in health care curricula has, for decades, been perpetuated by the unspoken rationalization that the evolution of knowledge in these areas was virtually complete or at most changed at a snail's pace. In reality many of the basic sciences were indeed in a state of equilibrium, balanced by the then current limitations of science as coupled with educational complacency. Recent explosions in technology have unraveled this security blanket and rapidly accelerated the knowledge bases. Complicating the issue is the fact that some educators treat new information as being supplementary in nature thus making for more convenient incorporation into existing courses. This is clearly an inappropriate response as today's advances require rethinking of the very tenets of the basis sciences with subsequent restructing and reorientation of their presentation.

Integrated analysis and subsequent modification of the content and orientation of the basic sciences could yield courses which would foster the scientific method—the essence of scientific inquiry and patient care. If such a scientific yet practical approach to problem solving can be inculcated in neophyte clinicians, then the basic science courses will cease to be a quagmire of facts, to be retained only long enough to satisfy institutional and national board requirements. The basic and visual sciences might no longer be viewed by students as a necessary evil, a hurdle to be cleared on the way to the "good stuff." Instead these courses could provide the truly necessary building blocks for a self-directed, life long continuum of learning, equipping students to solve clinical problems—to think. If sincere, such a reorientation of the basic sciences might even free time in the curriculum, time to be filled with sorely needed courses in interpersonal skills, ethics, and patient management—those elements, oft espoused as the sine qua non of optometry. □

The Impact of the Projected Trends and Changes in the Health Care Delivery System on the Optometric Profession

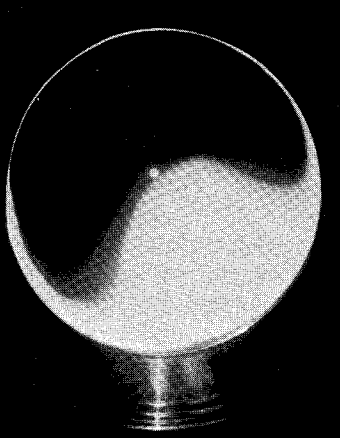
Richard L. Hopping, O.D., D.O.S.

The primary issues of health care revolve around the organization, delivery and the financing of health care. These fundamental factors, in turn, are each greatly impacted by the makeup of our nation's population that is to be served. Obviously the "graying of America" is and will be of primary concern.

The health care system in the United States is pluralistic within a democratic society. The health care system is presently undergoing multiple changes and will continue to do so. Health care delivery has moved from a service-oriented cottage industry to a for-profit center based system. Costs of the nation's health care have been known to be out of control for over 15 years, so much so that it repeatedly has precipitated the threat of a nationalized system of health care. The United States spends a larger proportion of its gross national product (GNP) on health care than any other nation in the world—even those nations with comprehensive national health care plans. Some experts believe that our nation's entire economy could be undermined if appropriate solutions to curtail health care expenditures are not found.

The "graying of America" will continue to play an enormously significant role in the future direction of the health care delivery system. The older population, defined as including persons 65 years or older, numbered 27.4 million in 1983, represented 11.7% of the population or one in every nine Americans. Today those 65 and over are estimated to be over 12%. It is predicted that by the year 2030, there will be about 65 million older persons, two and one-half times their number in 1980. In addition, the older population is becoming older. In 1985, 31% of our population was already over 45. By the year 2000, nearly half of us will be over 45. Thus, not only will there be a continuing increased demand in utilization, but the level of care needed will increase. Society in general will have to cope with lack of care for the uninsured and elderly, and an increasing disparity between services for the rich and poor.

"The rapidity of change is altering the ground rules for forecasting new developments."



The commonly accepted belief that the past is a prologue to the future may become increasingly less useful as a means of planning for new developments. The rapidity of change is altering the ground rules for forecasting new developments. Megachanges are the keys as all the parts begin to take on new characteristics. Although the days of an impending national health plan seem to be gone (our nation's debt status puts it beyond consideration), health care practitioners can be certain that government will continue, directly and indirectly, to effect changes in the health care provision systems by the imposition of strong financial curbs.

The cost of health care has already precipitated far reaching federal actions. Diagnosis related groups, professional fee freezes, encouragement of entrepreneurship, the encouragement and financing of HMOs, discontinuance of most surgical assistants' fees, the creation of peer review organizations and the proposed fee reimbursement levels for IOLs are examples of but a few of the government precipitated changes.

I believe government has given up and the for-profit sector is moving in. Delivery is now moving to an ambulatory system with definite trends toward a total system. Much of health care will soon be in the for-profit sector. A many layered system will emerge as a result of consumer purchaser preferences and the ability to pay. The concept con-

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trolling and/or of driving down health care costs by means of competitive entities will continue to be a prominent device for the balance of this century. The individual consumer is no longer standing alone in an endeavor to control costs. Powerful allies have appeared in the form of executives of large corporations, major insurance companies and federal and state government.

A major movement is underway to shift control from the health care providers to the actual consumers. The so called deregulation, as symbolized by the forced choice for employers of over 25 employees to offer HMO care and the diagnostic related groups (DRGs), is only the first step in removing the control from the providers. A general deregulation similar to that occurring in the airlines is the motif. Providers will no longer collect costs just because they are incurred; actual costs will not be the consideration. Effective management is being forced on the various components of the health care system by dictum. The emerging response of price competition is strengthening the concept of a purchaser driven system that is more in tune with the general economic system of our nation than in the hallowed tradition of the professions knowing what is best.

Decentralization of health care is moving from the hospital to the community, often to ambulatory surgical centers and nursing homes. Many hospitals are in great danger with perhaps as many as one fifth of America's hospitals going out of business by the end of the century; many hospitals are already developing competing mechanisms. With decentralization and fragmentation leading toward dissolution of traditional practice patterns and cost consciousness as incentives for change, the stage in health care is set for innovative approaches.

Another form of leverage is occurring in modalities used to cover the cost for those who cannot afford to pay for their health care. Coverage is being pared back. A two-tiered system of quality, quantity and access routes appears likely to emerge. The shadow of economic euthanasia may be lurking in the wings. Bioethics may become enigmatic—who lives, who dies, who decides? Technology, resource allocation, quality of life are all factors.

Probably one of the most significant influences in effecting change in both the external and internal environments of the health care system will be the exceedingly rapid expansion of knowledge. The amount and pace of change that has occurred in those professions since the turn of the century will appear very modest when compared to what will occur when we enter the new century. All indications are that much more intense development of the clinical professions will occur in the next twenty years than has occurred in the past eighty. The vast changes in scientific knowledge and technology will drive the health care system relentlessly into an entirely new pattern of professional preparation which cannot be conceptualized by the most imaginative educators at this time.

Health care providers are no longer in a sellers' market—the golden age for health care providers has passed. Today it is a buyers' market and many practitioners have not changed their style, attitude, services or procedures. Practitioners must change if they are to survive under the new parameters of delivery. By the year 2000, health care could take two very different turns that would substantially change health care practice. Researchers have outlined two possible scenarios.

In one version, 75% of all Americans would be included under some form of managed care, such as the health maintenance organizations or preferred provider groups that exist today. For health care providers, this means lower income (salaries) and less control in making clinical and economic decisions about their own work.

In the second version of the future, health care will be controlled by the demands of aging baby boomers who "want more," but not more of the "same" health care services and who are willing to pay whatever it takes to get them. This demand version will result in more dollars being spent on health care, slightly higher salaries for some practitioners and the creation of new products and services delivered to a complex set of market niches. Providers operating in this environment will have to contend with misuse of technology and unnecessary duplication of facilities and services.

In both versions, health care providers will find themselves facing a surging competitive health care market. Providers should monitor, anticipate and plan for changes in their patient mix. During the next decade, the success of health care providers will be dependent on multiple factors:

- Strategic and financial planning;
- Refined management skills;
- Risk identification and analysis;
- Integrated clinical and financial cost accounting;
- Prudent application of new technology; and
- Predictive market analysis.

Although increased competition among health care providers appears to be a generally accepted trend of the future, there is some concern over whether this will have a positive or negative impact on access to and quality of health care. Legislators, in their efforts to control health care cost increases, must be aware that they may indirectly be establishing a "minimum level of care." The tremendous effect this can have on our nation demands that our legislators carefully evaluate, fully understand and critically challenge proposed legislation in the years ahead.

The issue of cost versus quality creates a dilemma due to our belief in the rights of the individual and our desire to maintain the availability of the world's best health care system against the reality that we, as individuals and as a nation, have limited financial resources. The nation's conscience, therefore, must provide direction. Is health care a basic human right? If so, how much can we actually afford to spend on this need as opposed to other needs, such as education and food assistance? How much of the financial burden of health care costs should each person bear? Should a different level of services be offered to those who cannot afford to pay? At what point should new technology be made available? Where and for whom? Is this society ready to ration health care and, if so, is it willing to do so explicitly and openly?

The next ten years will bring great change for everyone in the health care system, including the patient. But, as before, the health care system will respond and the social philosophy of the health care professionals will help shape the final results.

The upward spiral of health care costs, as measured by the percent of the Gross National Product (GNP) devoted to health care, will continue and then level off. In 1982, the figure was 10.5%. By the year 2000, predictions are that it will rise to 12% and remain there for sometime.

It is believed that alternative health care delivery systems and ambulatory care is the most important way to reduce the cost of health care in the U.S. Increasing patient deductibles and coinsurance payments are also felt to be important. Uninsured persons without the ability to pay, who are also ineligible for government programs, will experience the most significant decline in accessibility and the quality of their health care services by the year 2000 unless the nation implements a nationalized program for this segment of the population.

The possibility of making a fundamental change from Medicare coverage of all elderly citizens to coverage based on financial need is a realistic possibility. It is believed that a significant increase in Medicare premiums, deductibles and coinsurance will occur and that the qualifying age for receiving Medicare benefits will be raised. There is growing agreement that a terminally ill patient, or the family when the patient is incapable of doing so independently, should have the right to refuse extraordinary treatment that would prolong life. By the year 2000, I believe that life and death will be defined legislatively to allow the withdrawal or nonuse of life support systems in cases of terminal illness. We must define life in terms of function, not just heart beat.

There is a growing belief that malpractice awards should be limited. It has been predicted that Congress will act by 1990 to limit malpractice claim awards, which should result in more reasonable and affordable malpractice insurance premiums and less defensive medicine.

The trends previously discussed will have great impact upon all participants in the health care delivery system: patients, providers and third party payors. Some projections are:

- The amount of money spent nationally on health care services will continue to grow, affecting all elements of the health delivery system.
- Emphasis in health care will shift to ambulatory services and new alternative delivery systems.
- New types of providers will erode the acute care inpatient hospitals' share of health care expenditures. Nonprofit hospitals will be at a disadvantage in attracting capital financing and many will have to create new corporate structures and business ventures to compete in the capital market. Investor-owned hospitals will substantially increase numbers and will be more profitable. Multi-hospital systems will continue to grow and will be positioned best to implement and take advantage of the strategies of choice in the new competitive market. Hospitals and their medical staffs will collaborate and advocate together on behalf of the patients they serve. This collaboration will lead to the development of new relationships and new organizational designs for working together.
- The anticipated oversupply of physicians and the continued trend toward practicing in hospital-based positions and alternative delivery systems will mean a decline in physician influence. These factors also mean a decline in the fee-for-service payment method. Prospective payment systems will be extended to include physician payments and this trend will result in a drop in their relative income levels. Increased fiscal restraints and greater use of prescribed patient care protocols portend less autonomy for tomorrow's physicians, more frequent conflict with their hospitals and an anticipated decline in the professional satisfaction they will derive from their practice. This general attitude will spill over and permeate all health professions.
- For other providers such as nursing homes, extended care facilities, specialty care institutions and ambulatory care facilities, it is expected that greater utilization and growth of less expensive alternatives to acute inpatient hospital care will occur. More providers, both institutional and individual, will compete in the markets represented by these alternative levels of care.
- For the patient, it is expected that the quality of care will diminish. The level of patient financial participation will increase and the patient's expectations of the health care system will have to be adjusted. Persons covered under governmental programs can anticipate the greatest changes as the benefits and eligibility standards of these programs will undergo the most significant changes. Patients with private coverage will experience restrictions as well, but additional levels of service will be available to those willing and able to pay for them.

The predicted changes in the health care delivery system with their inherent effects upon future providers compels the professional education system to reassess its relevancy to future practitioners' needs. The schools and colleges of optometry must review their mission statements and potential curriculum changes should be addressed at least once every five years. Students, faculty and alumni should be surveyed periodically for their views regarding the curriculum relative to actual practice in the then existing health care delivery system. Each institution should accomplish a periodic assessment of the status of its graduates rather than merely addressing the educational process.

Curriculum changes must be initiated immediately to prepare graduates for the health care delivery system which will exist in the year 2000 and beyond. Curriculum changes must not only incorporate new information, new technology and new modalities, but various emphases in the current curriculum must be significantly altered.

Some changes in curriculum which will be necessary are:

- The curriculum must be altered to provide the graduate with the tools necessary to dispense optimal and affordable care to the public. This will require placing greater emphasis on the aspects of practice besides those related to professional technology.
- Greater emphasis must be placed on teaching students to think. Less importance should be given to memorization of facts and more emphasis placed on developing intellectual curiosity and critical thinking. There should be a significant increase in problem solving exercises and greater integration between basic and clinical sciences.
- The present curriculum should be pruned to allow room for those features which, in the projected health care delivery system, will possess greater priority in preparing graduates for new practice modalities.
- The curriculum should include an extensive clinical program, diverse in practice settings, which will sufficiently expand the student's experiences to include a wide variety of delivery systems and clinical settings, and a wide variety of ethnic, socioeconomic and age groups.
- Major emphasis should be placed on the development of appropriate inter-

personal communications skills. Teaching methods must be incorporated to increase the student's development and use of interpersonal skills.

- Students should be taught how to organize, manage and participate in health care teams. The curriculum should include aspects of organizational management, administration and the elements of a systematized health care system, including optometry's role in the system. Residencies should be offered in integrated health care systems which provide advanced training in secondary ophthalmic care.
- Greater emphasis must be placed on the aspects of practice management, including business management, practice administration, patient management and professional enhancement.
- There must be increased exposure to and demonstration of the fundamental precepts of professionalism and ethics. The curriculum should also allow for increased presentations relating to the legal aspects of optometric practice, including both governmental and malpractice considerations.
- The curriculum should be designed to provide a greater knowledge and understanding of systemic diseases.
- The continuing shift in age distribution of the general population mandates an increase in the student's understanding and insight into areas of gerontology. This requires a significant increase in the student's exposure to gerontological information, technology and patient management.
- Greater emphasis should be placed on the technology and management in the specialty areas of practice other than contact lenses.

In closing, it seems appropriate to quote John Naisbitt, author of *Megatrends*, in which he emphasizes that all American society is in transition and that most of us hold on to the old ways for fear of the future. He goes on to say that "those who are willing to handle the ambiguity of this in-between period and to anticipate the new era will be a quantum leap ahead of those who hold on to the past." □

OPTOMETRY 2000

The Impact of the Humanities, Ethics and the Liberal Arts on the Practicing Optometrist

Willard B. Bleything, O.D., M.S.

The Concern

THE SCENE: The scientific revolution, which had its fundamental beginnings in the 16th century, generated a singularly productive method of investigating the natural world. Basically, the method entailed learning how things worked by the analysis of complex matter into its components. Following this lead, experimental medicine (health care) required the investigator to evaluate facts within the framework of specific criterion, so arranged as to control the evaluation.[1] And so by careful design, the new investigations of nature sought to banish from scientific inquiry all considerations based upon value. The 20th century scientist was urged, above all things, to strive in his judgments for self-elimination, the habit of forming a judgment upon facts unbiased by personal feeling. This was the "proper" scientific frame of mind.[2]

This approach became literally translated into clinical practice wherein results could be measured and clinical signs could be expressed in numbers—materials for diagnosis which are incontestable and independent of the opinion, amount of practice or the sagacity of the observer.[3] As the century progressed, so did the confidence in this analysis, a confidence based upon the dependable image of the data-generating machine. These forms of knowledge seeking and evidence have been conceived in many quarters of health care as completely sufficient. They are all that is needed to deal with the problems of understanding and treating illness. In this context, illness and the problems of healing and suffering are treated as biologic puzzles potentially solved by scientific techniques. There is no need identified to understand illness in the context of the non-biologic features of existence.[1]

Within the framework of modern clinical practice, reverence for objective evidence has led to a continual and

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serious decline in training health care providers to take histories or listen to patients; such data, subjective in content, personal, biased, is viewed as inferior. A counterpart of the practitioner's skepticism concerning the patient's statements is the distrust of one's own subjective judgments. Skill in physical examination has declined and perceptions and clinical judgments devalued, in deference to objective data sensed and generated by machines and interpreted by technicians and specialists.[4]

THE ACTORS: A study at Yale University recorded the impressions of their peers on pre-medical students.[5] They were perceived as excessively competitive and grade conscious, narrow in interests, less sociable than others and more interested in money and prestige. The pre-medical students saw themselves as being higher than average in mathematical ability and scientific ability, but lower in writing ability, speaking ability, creativity, originality and leadership skills. In order words those about to enter a profession where caring should be the central theme were characterized as being high in mathematical/scientific ability but narrow and noncreative, less sociable than others, with lowered ability in communication and leadership skills, and with a motivation of money and prestige.*

THE SETTING: Technology continues to add efficiency and precision to the provision of health care. Everyday examples are memory capable digital syphymomanometers and thermometers. This theme continues to remove human judgment from the monitoring of signs and symptoms. One result is more machines and fewer care givers. Alternative health care delivery systems are being aggressively developed as a means of encouraging competition. There is this greater movement to contain health care costs. The HMO/PPO (Health Maintenance Organization/Preferred Provider Organization) theme is one of cost cutting, of limiting procedures done per patient, of seeing more patients and spending less time with each. Economic forces drive clinical decisions. There are financial incentives to overtreat or to not treat at all. Various aspects of health care have taken on a merchandising flavor. Corporate influences put dollar gain ahead of patient need. In short, various forces are placing constant strain on value judgments required of the health care professional.

*It has been long assumed that the pools of applicants for optometry and medicine share common characteristics. For this reason, and since less has been reported relative to optometry, reference to pre-medical students is made.

The Rationale

Those who have experienced a quality liberal arts education can, typically, tell you more of how it felt than what it was. There seems an attention as much to the process as to the content. Favorite courses are remembered more often for the manner in which they were taught and how they affected the participant. While foundational in nature, the overall aim of a liberal arts education is the development of a basic worldview about one's place in life. It cultivates a matter of attitude rather than merely expediting knowledge. A liberal arts education is said to be value laden education which makes one aware of the good and bad, right and wrong—an education with a conscience. Expressed in its Latin form, *artes liberales*, it is knowledge which liberates.

In the early history of higher education, the liberal arts was a course of study which was preparatory to professional education—theology, medicine and law. The *trivium* was made up of grammar, rhetoric and logic; the *quadrivium*, arithmetic, geometry, astronomy, and music. Today there remains this continuity of foundation skills coupled to the in-depth pursuit of some theme—the major field of study. In this format, the goal of the liberal arts is to produce people who are not merely well-informed, but who possess both expert knowledge in a special field and broad knowledge of culture, history, and human destiny which will enable them to participate meaningfully and responsibly in a wide spectrum of significant human activities.[6]

It is felt that the liberal arts is bounded on the upper end by professional or graduate education and on the lower end by vocational or technical education. As one considers the particular niche filled by various members of the higher education community, research studies have found that liberal arts education appears to promote increases in conceptual and social/emotional sophistication. Thus, students trained in the liberal arts are better able to formulate valid concepts, analyze arguments and define themselves maturely to their world.[7]

If the goal, then, of the liberal arts is to train the mind—to force the student to reason and analyze—then I know of no better preparation for any of life's vocations. Perhaps this is expressed best by Newman in his book, *The Idea of a University*:

> "Again, as health ought to precede labour of the body, and as a man in health can do what an unhealthy man cannot do, and as of this health the properties are strength, energy, agility, graceful carriage and action, manual dexterity, and endurance of fatigue, so in like manner general culture of mind is the best aid to professional and scientific study, and educated men can do what illiterate cannot; and the man who has learned to think and to reason and to compare and to discriminate and to analyse, who has refined his taste, and formed his judgment, and sharpened his mental vision will not indeed at once be a lawyer, or a pleader, or an orator, or a statesman, or a physician, or a good landlord, or a man of business, or a soldier, or an engineer, or a chemist, or a geologist, or an antiquarian, but he will be placed in that state of intellect in which he can take up any one of the sciences or callings I have referred to, or any other for which he has a taste or special talent, with an ease, a grace, a versatility, and a success, to which another is a stranger. In this sense then, and as yet I have said but a very few words on a large subject, mental culture is emphatically useful."

The Approach

An era when "doctors" are no longer needed has been envisioned by some looking to the next century. Machines, with secondary human assistance, would perform diagnosis and direct therapy, triumphant in the superiority of their quantitative, objective approach.[9] And so does this call for an even greater "values" emphasis within undergraduate education—or is it all over? I sense not, at least as indicated by recent trends in the education of physicians. In scarcely more than a decade, the teaching of medical ethics has become a regular feature of medical school curricula. While variable in content, curriculum, time and pedogogical method, these

courses share certain common objectives, such as raising sensitivities to the moral issues in clinical decisions, teaching the skills of ethical analysis, and helping students to clarify their own ethical beliefs.[10] A study was conducted by the AMA in 1982 to measure the relevance and utility of courses in medical ethics.[11] Of those physicians responding who had received formal training, the majority believed that the training had been "very successful" or at least "somewhat successful" by enabling them to identify value conflicts (81.9%), increasing their sensitivity to patient's needs (78.7%), helping them to understand their own values better (76.1%) or dealing more openly with moral dilemmas with patients and fellow professionals (73.3%). Additional perceived benefits included a greater awareness of the physician's social responsibilities, encouragement to do more reading, and better preparation in ethical analysis of medical moral issues.

Ethical issues confronted in clinical practice were also examined and a comparison made between the receipt of formal ethics course work and a physician's perceptions of the adequacy of their training in preparing them to deal with each issue. In 64 percent of those issues listed, a statistically significant relationship was found between the receipt of formal ethics training and the perceptions of adequacy of their training to deal with them.

The majority of those responding recommended that formal programs be offered in all medical schools, and a substantial number of them felt it should be a required subject. Also the majority preferred that the teachers of the ethics course be physicians in comparison to philosophers, theologians or others. A seminar discussion group format was also favored.

Earlier this year Johns Hopkins University sponsored a conference entitled, "Medicine and the Humanities."[12] It had been preceeded by eight years of various activities around a similar theme. Lectures and concerts in the physicians' dining room of the hospital featured name artists. "Midday Performance," hour-long programs held at various campus locations, brought students and faculty together outside of the classroom. Students performed with faculty and actors, and mimes amused residents, students, faculty, technicians and secretaries. Hospital patients now view the events on closed circuit T.V. and a seminar, "The Culture of Medicine," is offered to premedical students.

A Summary Statement

The evolution of the health sciences has brought about greater objectivity and less subjectivity in clinical judgments. The power and importance of quantitative measurements of fact in health care, of evidence acquired and confirmed by experimental procedures are not really in question; however it is the extension of these forms of knowledge into all aspects of health care that is inappropriate. Over attachment to such evidence has gradually excluded from the health sciences the view of physical disorders as an intensely personal event, aspects of which cannot be understood or dealt with solely by methods based on experiment or measurement.[1] It is important to recognize human variety and individuality. We must be cautious not to be undermined by the scientific necessity of classifying patients into categories of various diseases and conditions. Coles has stated, "A sense of the complexity of human affairs, a respect for human particularity, an interest in the ethical, the just and the unjust sides of the social order, an awareness of life's unremitting contingencies ought to be part of the doctor's education, the doctor's everyday practicing life."[13]

Economic concerns have brought mechanisms into play that set the stage for overriding sound clnical judgment. While modern health care has one foot solidly planted in the sciences, the other foot remains firmly rooted in humanity, in the drives, dreams and needs of the people we treat. The health professional, as knowledge seeker and therapist, must understand both the technique of the scientist and the vision of the humanist. Unbalanced development, continued too long in either direction, imperils the entire enterprise of the health care professions.[1]

Recommendations

There is a decided tendency for students in pre optometry studies to center their attention on the natural sciences, and in many cases to carefully avoid the social sciences and humanities. The Faculty of the Arts, guardians of liberal education, point their finger at the professional school for exerting pressure on the liberal arts from a distance. There seems a real need to insist that those who are invited into the profession of optometry present as educated persons able to effectively articulate their thoughts to patients, peers and the public. Indeed the strength of the profession now and in the future lies in the quality of those who are its members. Pressures of ever-advancing technology and of the economy will continue to challenge the ethical foundation of the professional of tomorrow to make the right decisions for the right reasons.

Recommendation 1.

That students be trained in the use of the language, that they be able to communicate not only to be understood but so that they are not misunderstood.

Recommendation 2.

That there be an increasing emphasis placed upon value-centered education both in preparation for entry into professional studies and during professional studies with a particular focus on the integration of ethics into clinical decisions. □

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The Impact of the Changing Role of the Ophthalmologist, Optician and Technician

Michael H. Heiberger, O.D., M.A. and D. Leonard Werner, O.D.

To begin with let us look at the present status of the ophthalmologist, the optician, and the technician.

Ophthalmologist

There is much pressure to reduce the output of ophthalmologists which is currently about 425 per year.[1] By the year 2000, the non-surgical ophthalmologist will be less viable economically due to the expanding scope of the optometrist.

The surgical ophthalmologist will continue to be viable well into the next century due to the aging of the population, increased eligibility for third party coverage and the development of new surgical treatments for ocular disease and for refractive problems. A much larger proportion of the surgery, however, will be performed on an outpatient basis within the HMO, IPA or surgical center with a resultant lowering of fees.

Optician

It is estimated that there are currently 30,000 opticians in the United States. Of these, about 1,000 are currently employed by HMOs.

The median income of opticians is now about two-thirds higher than that of technicians.[2] Income figures for technicians who specialize in dispensing are not available but it is likely that the discrepancy in income might be less if only this sub-group were considered.

Technician

What will be the impact of technicians by the year 2000? Instead of gazing into a crystal ball, let us look at one group of technicians as of 1986. This group, classified as ophthalmic medical assistants, is totally controlled by ophthalmology, from training to certification to employment. Table 1 is a description of that group as it already exists.[3]

In addition to the ophthalmologically oriented technician group described above, there is a group of about 1,725 registered paraoptometrics trained by optometry plus a countless number of individuals working at various levels with no formal training and no registration or certification. There are twelve optometric technician programs (two at optometry schools and ten at community colleges) and seven programs for the training of optometric assistants. Last year, these programs accounted for 180 new technicians and 110 new assistants.

Interestingly, while optometrists still outnumber ophthalmologists by better than 2:1, registered ophthalmological ancillary personnel outnumber registered paraoptometrics by greater than 2:1. Actual numbers working in both fields may be far different but, clearly, ophthalmology is much further along than optometry in the formal training and recognition of ancillary personnel. Ophthalmology continues to produce at least double the number of ancillary personnel each year than does optometry.

The Future

The role and scope of services rendered by ophthalmic practitioners, at any point in time, is directly related to the delivery and reimbursement mechanisms in place at that time. Before discussing role and scope of services in the year 2000, we must make the following assumptions about the environment of that time:

1. The HMO or IPA model will be the predominant structure for all health care delivery (including eye care) and will be the dominant force in the health care market. Such systems will heavily utilize ophthalmic ancillary personnel of all types because of cost effectiveness.
2. All non-ophthalmologist providers of eye and vision services will continue to expand the scope of their responsibilities each group encroaching on the next one up in the hierarchy. Changes in technology will permit people with lesser education to perform more sophisticated patient care roles.
3. A larger and larger percentage of ophthalmic surgery will be performed by a smaller and smaller percentage of ophthalmologists. Some non-surgical ophthalmologists will enter sub-specialties (e.g. neuro-ophthalmology, clinical oncology, pediatric ophthalmology) while others will become unrecognizable from optometrists who treat ocular pathology.
4. Ophthalmologists will have income levels controlled by third party payers. The U.S. Chamber of Commerce (June 1986) estimated the

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average income of ophthalmologists will be $60,000 in the year 2000.[4]

As in the past, economics will be the major factor that drives the system. The growth of the HMO, IPA or large commercial ambulatory surgical centers will make the issue of cost control central to the structure of the system. Such an environment will encourage the upward mobility of the various non-ophthalmological providers.

In all likelihood, three distinct groups of providers will emerge. Within the context of the large group prepaid setting, they will function as a team; each providing services commensurate with their training. These groups may be described as follows:

Table 1

Numbers: 3,737 certified as of January 1986. This represents a ten percent increase over January 1985.

Certification: Through the Joint Commission on Allied Health Personnel in Ophthalmology (JCAHPO). JCAHPO is a federation of ten major ophthalmological organizations in the United States and Canada and is recognized by the Committee on Allied Health Education which, in turn, is sponsored by the AMA. JCAHPO approves training courses and administers certification exams.

Number of Programs: There are 21 JCAHPO-approved formal programs in the United States and Canada.

Level of Training: There are three levels of training for technicians:

Level	Education/Training	Duties
I. COA-Certified Ophthalmic Assistant	Formal institutional course of up to 6 months or home study course of about 3 months.	case history; lensometry; instrument maintenance; tonometry; know CPR.
II. COT-Certified Opthalmic Technician	Formal coursework of up to two years. Credit also given for work experience, continuing education, or certification in another area of ophthalmological allied health (e.g. orthoptist).	clinical optics (refraction), ocular motility (V.T.), visual fields, contact lens fitting, surgical asst., opthalmic photography, diagnostic testing using special instruments.
III. COMT-Certified Ophthalmic Technologist	Prerequisite: two years of training in ophthalmic medical assisting plus two years of college or a four-year degree in ophthalmic medical assisting.	Same as for COT except more likely to specialize

A. *The Primary Care or Entry Point Practitioners:* Diagnosis, treatment and patient management would be the responsibility of this group. This group would refer patients to the two other groups. Most optometrists and some non-surgical ophthalmologists would comprise this group.

B. *The Technicians:* A group drawn from present day ophthalmic assistants and technicians, opticians and some optometrists, this group would provide services such as refraction, dispensing, contact lens fitting, vision training and low vision. To the extent that dispensing services will become a part of the future delivery mode, opticians will be jockeying for position with technicians in these prepaid settings. The major issue will be whether or not those third parties who will be paying for care in the year 2000 are going to require standards of training and certification for these people and who will do the training and certification. Except for those technicians involved with surgical procedures, this group would be supervised by the primary care practitioners (Group A above), the degree of supervision being a critical issue.

C. *The Surgeons:* This group, drawn from present day surgical ophthalmologists, would perform all ocular surgery. There will continue to be a good deal of sub-specialization within this group. There is some question as to whether laser treatment would solely be within the provionce of this group or shared with the primary care or entry point group.

Group B is, potentially, the largest of the groups because of the relatively high incidence of visual conditions that can be treated using the techniques available to that group. One factor that will greatly affect the relative size of Groups B and C is the future of refractive surgery.

Practitioners trained at the level of the present day optometric graduate will have a future in Group A. The availability of slots in Group A, however, will be heavily affected by the number of non-surgical ophthalmologists who exist by the year 2000. Their size and eco-

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ASCO's Strategic Plan for Optometric Education — Year 2000

General

1. The Association of Schools and Colleges of Optometry should foster the development of educational and behavioral objectives as well as a curriculum model for the basic/entry levels of competency that define the core optometric curriculum. This core should encompass the knowledge and skills necessary for a primary care optometrist. Additional material available in the curriculum would contribute to the education required for the optometric specialties. These elements should be reviewed at least every five years by ASCO.
2. The educational process should emphasize critical thinking:
   a. Alternatives to the lecture system should be explored so as to better meet educational objectives. Self-directed learning, carefully designed assignments promoting critical thinking skills, problem solving preceded by examples of appropriate thinking patterns and techniques and classroom discussion sessions are possible methodologies for this purpose.
   b. The evaluation of students should emphasize critical thinking and application concepts and not rely predominantly on memorization.
3. Behavioral/educational objectives should be established for each course in the professional curriculum and for graduation.
4. Tracks within the curriculum should be employed as a means to better achieve educational objectives and to effectively package information.
5. Students would be able to utilize "information management systems," for example, the use of computers to retrieve, analyze and manipulate information.
6. Communication skills (written, verbal and listening) should be enhanced and woven into the curriculum.

Basic Sciences

7. The basic sciences should consist of biological, physical, visual and behavioral/social sciences.
8. Coursework in the social sciences and the humanities should be recognized as an appropriate and necessary balance to the physical and biological sciences.
9. Basic science foundations, complemented by appropriately integrated clinical experiences, should prepare the student for the effective utilization of advances in technology.
10. Basic sciences subject matter should be coordinated and integrated with that of the clinical sciences.

Clinical Sciences

11. Clinical education and its requisite basic and clinical science education in the diagnosis, treatment and management of patients with ocular disease should be expanded.
12. Optometric educational programs should train students to utilize ancillary personnel to collect data, fabricate, verify and dispense ophthalmic materials, and instruct and assist patients in those areas not requiring professional judgment. Graduates should be knowledgable in all of these areas and qualified to supervise ancillary personnel.
13. The exposure of students to a variety of patient populations (cultural, socio-economic, ethnic, etc.) should be broadened.
14. The psycho-social impact, including life-style changes, of vision problems of the elderly should be fully considered both in coursework and in clinical experiences in gerontology.
15. Where possible, students should be exposed to the concept of the health care team by means of training in interdisciplinary clinical settings.
16. The primary care role of the optometrist in the provision of vision care shold be fostered through the utilization or establishment of model multidisciplinary practice settings both to optometrists and by optometrists to others.
17. The utilization of specialized optometric expertise, including appropriate consultative referral policies, should be addressed in optometric education.
18. The importance of faculty serving as positive role models in the development of caring, value-oriented professionals should be recognized and promoted.
19. Clinical sciences subject matter should be coordinated and integrated with that of the basic sciences.
20. Educational objectives should be established in the areas of community involvement and knowledge of political process.
21. The optometric curriculum should provide the fundamental precepts of professionalism and ethics regardless of practice environment.
22. Greater emphasis should be placed on the management of all types of practice; practice administration, business management, patient management, and professional enhancement should all be included.

Specialty Training

23. The schools and colleges of optometry should have the option to provide specialty training to students, and to graduates, through either electives or residency programs.
24. Both management and technological issues relating to the specialty areas of optometric practice should be considered in educational programs developed by the schools and colleges of optometry.
25. The Association of Schools and Colleges of Optometry should make every effort to develop the support of the profession for the recognition, definition and certification of optometric specialties. □

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nomic viability will also hinge on the political savvy of this group and its ability to prevent erosion of the role of the optometrist and his/her professional responsibility by Group B.

Specific Recommendations for Modifying the Optometric Curriculum

1. Schools and colleges of optometry must seek to expand clinical training in the diagnosis and non-surgical treatment of eye disease.
2. Where possible, optometry students should be trained alongside technicians, opticians and ophthalmologists. If graduates are not prepared for interdisciplinary group settings, they will be left out of them. Effective program goals should be set that value practice within a prepaid group setting on a par with private practice.
3. Schools of optometry must include, within their professional curricula, objectives which address student awareness and sensitivity to the changing health care scene and to the roles they will have to play in shaping the future of optometry. Community optometry tracks will have to include material on the political process so that students will be better trained to become more sophisticated lobbyists and activists during their professonal lives. The continued importance of organized optometry as a political force must be understood and appreciated.

Summary

The danger of the scenario just described is the expansion of the technician group at the expense of the others, particularly optometry as we know it. Politically, our profession must continue to carve out new frontiers while attempting to keep legal and professional control over its traditional roles. In spite of the expanding potential patient load due to the aging of our population, we have a potential for not needing the projected 29,700 active optometrists who will be in place by the year 2000. □

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RESOURCE REVIEWS

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

Residency Directors' Role in Specialty Certification, John S. Lloyd, Ph.D., Ed., American Board of Medical Specialties, Chicago, Illinois, 1985, 254 pp., illus., hard-bound, $34.95.

This book reports on the proceedings of a conference by the American Board of Medical Specialties (ABMS) Committee on Study of Evaluation Procedures (COSEP) and Project Task Force on Program Directors' Evaluations of Residents for Specialty Boards (Task Force). The conference brought together residency program directors and board members to discuss and define the program directors' role in candidate evaluation and certification process.

This book explores in depth the issues involved in evaluations of residents. It begins with a sociological perspective. What are residencies like? How are residents evaluated? What are the most obvious problems with the current standards? Other chapters deal with how and when evaluations should be done, who should evaluate residents and how evaluations should be used. Many examples of evaluation forms used by various specialty boards and research studies on program ratings and psychometric issues in rating clinical competence and performance are presented.

While this book does not specifically address optometry, there is much information which can be used in the evaluation of optometry residents and residency programs. This book is highly successful in identifying elements of residency training and evaluation common to all specialties. It is recommended reading for all optometrists involved in residency training programs.

An underlying theme of the book is that effective residents differ little from specialty to specialty. Appropriate integration of cognitive, affective and motor domains with interpersonal skills is the key element in development of the clinician. Appraisal of the cognitive domain includes the amount of knowledge, comprehension, analysis, application, creation and common sense demonstrated by the resident. The affective domain relates to personal attitudes as integrity, reliability, high ethical and moral standards, dedication, maturity, humanism, stress tolerance, adaptability, meticulousness and professionalism. In the motor domain residents must have the ability to perform specific motor movements, with dexterity in a coordinated and time-efficient manner. Manual dexterity, three dimensional perception, hand-eye coordination and fine motor control are crucial elements. Interpersonal skills involve patient satisfaction. Both verbal and nonverbal communication are essential.

For effective doctor-patient relationships, interaction of all components is required. The example given by Wilson is that of a surgical procedure. The hands are the motor implements but the selection and timing of the procedure are cognitive functions. Obtaining the patient's trust and cooperation results from the interpersonal skills of the doctor. The entire encounter is driven by the doctor's attitudes, values and ethics.

Overall the text is readable, although it could be more concise. It will provide valuable information for faculty evaluating optometry residents and residency programs. □

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SUSTAINING MEMBER NEWS

Sustaining Members support ASCO initiatives on behalf of the optometric education community. 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.

Vision-Ease Announces Sweepstakes Winner

Steve Rousu, Managing Optician of Great Northern Optical in Brainerd, Minn., won a seven-day all-expense paid vacation for two to Japan in the Vision-Ease Versa-Lite™ sweepstakes, designed to reward dispensers for outstanding Versa-Lite polycarbonate lens sales.

To qualify for the sweepstakes drawing, optical retailers had to be one of the top three Versa-Lite polycarbonate lens sales performers in their territory. A number of retailers from various territories nationwide qualified for the sweepstakes. Rousu, one of the retailers achieving outstanding Versa-Lite sales results during the promotion, won the sweepstakes drawing.

Vision-East Versa-Lite polycarbonate lenses, made of a virtually unbreakable hard resin, are lighter weight and allow for thinner lenses than other materials. "It wasn't difficult to interest customers in Versa-Lite lenses," says Rousu. "They're ideal for active adults and children because they protect the eyes from impact. In addition, they look better on people requiring stronger prescriptions because they're thinner."

Vision-Ease, worldwide manufacturer of optical lenses, has distribution centers throughout the United States and Canada with manufacturing facilities in St. Cloud and Minneapolis, Minn., and Fort Lauderdale, Fla.

Paragon Sponsors Pre-CLMA Seminar

In the September issue of its newsletter, "Paraphrases," Paragon Optical, Inc. announced its second annual Pre-CLMA Seminar held October 20, 1987 in New Orleans. The program was provided as an update on future products and methods for increasing business through Paragon products. The afternoon workshop was followed by a Mississippi Riverboat dinner and gambling cruise.

Paragon also announced the appointment of Larry Lapine as Northeast Regional Sales Manager.

New Video Tapes from Plus Ten and Varilux

A set of four tapes on all aspects of Progressive Addition lenses is now available from Plus Ten and Varilux. Varilux Video Workshop, is produced for Multi-Optics by Plus Ten, specialists in training tapes. The Varilux Video Workshop includes:

- **The Basics of Progressive Lenses:** explains the theory of Progressive Addition Lenses.
- **Fitting the Progressive Lens:** demonstrates and explains the four simple steps for successful fitting.
- **Selling and Dispensing the Progressive Lens:** shows how to present progressive lenses to patients, and how to effectively and simply dispense them.
- **Seeing better after 40:** Your Vision Alternatives: explains and graphically demonstrates common visual disorders including Presbyopia. Also shows multi focal corrections available to patients.

The learning workbooks included with tapes I, II, and III provide review questions on tape content. Tape IV is an excellent waiting room tape, and can also be used by students to review their own list of lens options for patient education.

These four tapes are a good resource for dispensing courses, and for student review. The Varilux Video Workshop tapes sell for $29.95 each. When buying the complete set a 15% discount applies for a total cost of $101.95 plus shipping. The Varilux Video Workshop may be ordered from Plus Ten, 1-800-262-8363, or from Multi-Optics Corporation. □

Allergan Introduces Ultrazyme Enzymatic Cleaner

The 100th anniversary of the development of contact lenses was marked on September 10 with the introduction of a new breakthrough soft contact lens enzymatic cleaning product.

That breakthrough is Ultrazyme™ Enzymatic Cleaner from Allergan Optical, the first product that combines protein removal with hydrogen peroxide disinfection in one easy step. Ultrazyme is designed to make lens care easier, more effective and less intimidating.

"The technological advances in contact lenses during the 100 years since A. E. Fick conducted his first experiments in Switzerland have been remarkable," said Don Earhart, president of Allergan Optical, a division of Allergan, Inc., the world's leading eye care company. "Lenses have become softer, smaller, more flexible and more versatile. Yet millions of people do not regularly wear their lenses because proper lens care has been so time consuming."

"We think the 100th anniversary of the development of the first lenses is the perfect time to announce a breakthrough that makes lens care easier, and addresses the problem of people not properly caring for their lenses."

A recent study by the Centers for Disease Control[1] in Atlanta found that 40.7 percent of those surveyed were unlikely to take proper care of their lenses. There are an estimated 14 million occasional and former contact lens wearers who do not use their contacts on a regular basis because of inconvenience or eye irritation or both.

Ultrazyme received marketing approval from the Food and Drug Administration in June. It is the first enzymatic cleaner developed to be used specifically during hydrogen peroxide disinfection. Since their introduction in 1983, hydrogen peroxide disinfection systems have rapidly grown to become the system of choice among eye care practitioners. Nearly half of all new soft contact lenses fit in the first half of 1987 were started on hydrogen peroxide disinfection systems, and that figure is expected to rise to 67 percent by the end of the year. □

Ultrazyme™ is a trademark of Allergan, Inc.

[1](MMWR 1986; 35:405-408)

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