Winter 1988
Volume 13, Number 3

JOURNAL OF OPTOMETRIC EDUCATION

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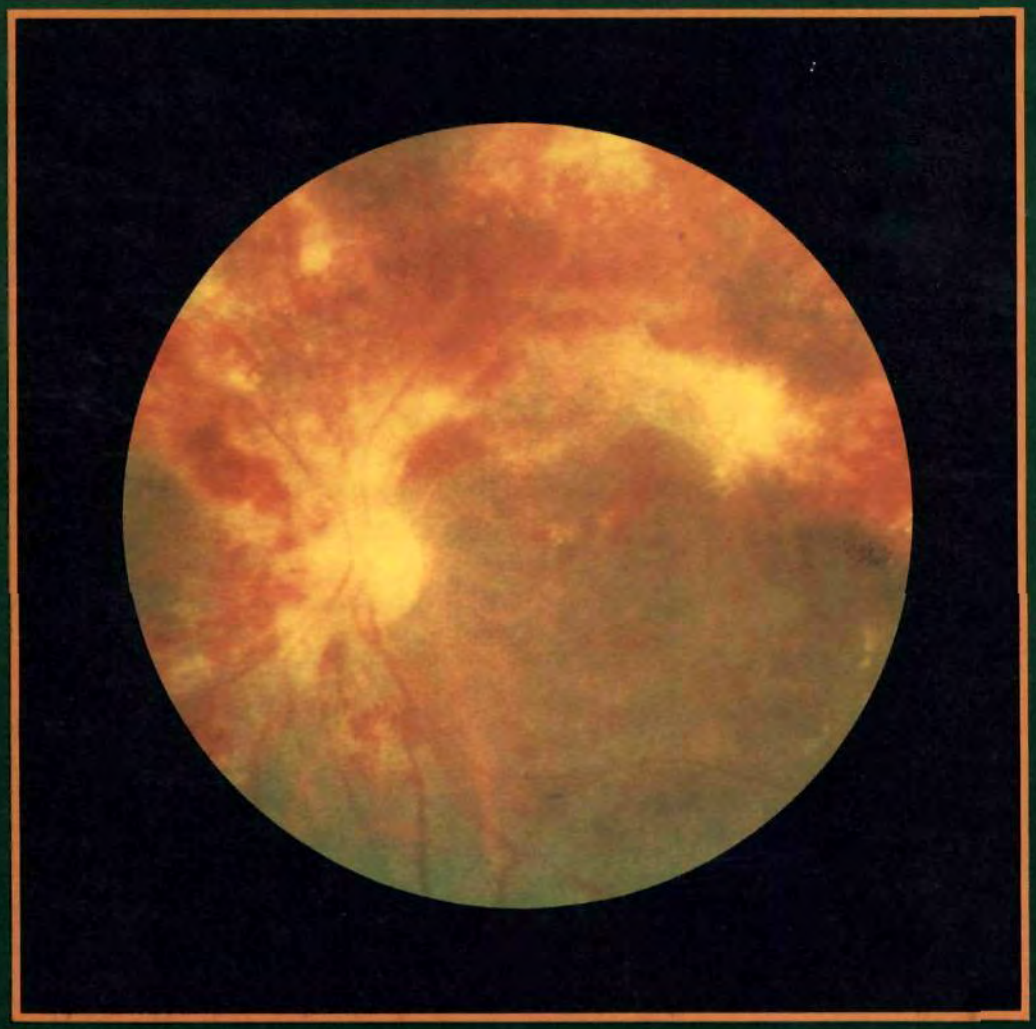

THE EDUCATIONAL CHALLENGE

SPECIAL FEATURE: Curriculum Model for Oculomotor, Binocular and Visual Perception Dysfunction

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ISSN 0098-6917

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DEPARTMENTS

Cover Photo: Cytomegalovirus Retinitis is the most common retinal opportunistic infection associated with AIDS. Photography courtesy of Brian Den Beste, O.D., of the Eye Institute of Central Florida, Orlando, FL.

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EDITORIAL

Optometry Can Help in the War Against Aids

In this issue of the *Journal of Optometric Education*, Dr. Roger J. Wilson issues a timely call for increased attention to the problem of AIDS in the curricula of optometric schools and colleges. This is a suggestion I welcome highly. It will take the best efforts of us all—educators, health professionals, scientists, families and communities—to bring this epidemic under control.

At this stage of the epidemic, several things are clear. AIDS is the most severe consequence of a range of illnesses caused by human immunodeficiency virus (HIV) infection. The behaviors most likely to place individuals at risk for infection have been identified. They include sexual activity with an HIV infected individual and sharing of contaminated needles. Viral transmission by blood or blood products has been described. With a cure not yet in sight, education for prevention remains our principal weapon for control. Considerable resources are being devoted to research, and patient care will draw about 40 percent of the estimated $1 billion the Federal Government will spend on AIDS this year.

In late November 1987, the Centers for Disease Control estimated that there were approximately 20,000 surviving patients with AIDS. In 1986 the Public Health Service projected that this figure would increase to about 91,000 in 1991. This estimate does not take into account the life-prolonging effects of zidovudine (Retrovir—formerly known as AZT) or other drugs that may be developed, nor does it take into account the recently expanded case definition of AIDS. Even more important for the long-term are the estimated 1 million Americans who may be infected by the AIDS virus, and can spread it to others, even though they may currently show no signs of illness. Present data indicate that 20-30 percent of individuals can be expected to develop AIDS within 5 years of first becoming infected.

While many optometrists may have yet to see an HIV-infected person in their practices, the numbers suggest that this situation may change. Accordingly, it is time for optometry, and all the health professions, to raise their level of awareness, understanding and ability to deal with the manifestations and consequences of the HIV infection.

It is essential that optometrists be realistic about the level of risk involved in treating infected patients. While the virus has been identified in the tissues of the eye and in tears, no cases of transmission by such contact have been reported. If optometrists adhere to well-established office hygiene and infection control procedures, the risk to the optometrist and to other patients can be considered nonexistent.

As Dr. Wilson points out, there are various ocular manifestations of HIV infection and its related complications. The practicing optometrist should remain current on the clinical manifestations of HIV infection, and should maintain a high level of awareness, especially regarding people who engage in high risk behavior. Early identification of these complications and appropriate medical referral for early treatment often can prevent more serious consequences.

Finally, all health professionals must recognize the serious psychological impact which a diagnosis of HIV infection or related conditions can have on a person. In the treatment encounter, the professional must make every effort to provide a supportive environment for these patients.

Health professionals such as optometry must look to education of both their current members and students in training. The colleges and schools are integral to this process. Dr. Wilson's paper is a valuable contribution with its suggestion that the schools of optometry can readily incorporate new material on HIV infection into their curricula without major disruptions of an already crowded course of study.

In short, optometry is one of many professions that can make a contribution to our national effort to care for people with AIDS and related conditions.

Optometrists can perform a significant service to their patients by approaching AIDS risks realistically, by being knowledgeable about prevention and recognition of the disease and developments in its treatment, and providing infected patients with the humane and supportive care that we all have a right to expect from the health professionals we consult.

Otis R. Bowen, M.D.
Secretary of Health and Human Services

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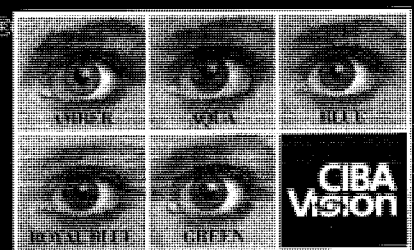

Clinical Optics, T. E. Fannin and T. Grosvenor, Butterworths Publishers, Stoneham, MA, 1987, 467 pp., hard-bound, $59.95.

Clinical Optics, a comprehensive ophthalmic optics textbook written specifically for students of optometry, is an ideal supplement for ophthalmic optics programs. Because it is written and organized from a clinical perspective, it should also prove to be a valuable resource for practitioners.

Clinical Optics is divided into thirteen chapters. The first nine chapters cover the basic principles of ophthalmic optics: physical and optical characteristics of ophthalmic lenses and lens material; frame design, selection, and dispensing; absorption characteristics of lenses and coatings; lens aberrations; measurement and specification of lens power; and the optical correction of refractive errors. The remaining four chapters discuss optical considerations which are unique to specific patient populations: patients with high refractive errors or anisometropia, low vision patients, and contact lens wearers.

Each chapter is organized in an orderly, logical format. The text is clearly written and enhanced by numerous diagrams and illustrations. Unfortunately, all diagrams are in black and white; the use of two colors would have allowed for simplication of the more complex diagrams. Sample problems appear frequently in the text and their solutions are presented in a step-by-step fashion which is easy to follow. Each chapter is accompanied by 15 to 25 problems (the answers are included in an appendix) which serve to emphasize the major concepts.

Interspersed throughout each chapter of *Clinical Optics* are sections devoted to non-optical clinical considerations. For example, in the chapter on optical correction of aphakia, there is a section on the optometric management of cataract patients. It discusses when and how to inform your patient of his condition, and the criteria for referral to a cataract surgeon. The chapter on absorptive lenses includes a discussion on the ocular effects of ultraviolet radiation, including the ocular signs and symptoms of photokeratitis. These clinical "digressions" serve to illustrate that ophthalmic optics is an integral component of clinical optometry and to remind the reader that there is more to optometry than simply prescribing the correct lens.

Practitioners will discover that, because of this clinical orientation, *Clinical Optics* is a handy reference guide. Numerous tables and charts are included which neatly summarize essential clinical information, and the detailed table of contents allows the reader to quickly locate specific information. The section comparing various invisible and progressive addition bifocal lenses and the chapter devoted to optical correction of high refractive errors are particularly useful to practitioners. However, *Clinical Optics* was designed specifically for use as a primary textbook for ophthalmic optics courses and optics instructors will undoubtably find it to be an excellent educational resource.

Guest Reviewer:
Catherine Hines, O.D.
New England College of Optometry

Presbyopia, Recent Research and Reviews from the Third International Symposium, Lawrence Stark & Gerard Obrecht, Editors, with 66 contributors, Professional Press, New York, 1987, 489 pp., illus., hard-bound, $95.00.

One of the problems associated with visual science is that there are areas like presbyopia which are of obvious importance but which often receive short shrift when it comes to available publications. Fortunately, the Essilor Corporation has sponsored three international symposia over the past ten years at which vision scientists have been brought together to present their current work in this important area. The result of the last and largest symposium is this text, *Presbyopia*, which summarizes the presentations of these scientists.

Primarily original research work, each chapter is the written rendition of each symposium participant's orally given paper. There are 66 papers in all and they are divided into seven main headings concerned generally with ergonomics, mechanisms of presbyopia, accomodative-convergence relations, corrective needs, and the means of correction. Because of the many different presenters from a wide variety of perspectives, there are numerous approaches seen in the material. Some papers are very basic science in orientation while others deal with clinical fitting of lenses.

The broad spectrum of material contained within this text makes it useful to many readers. It would make an excellent resource for college courses in both refraction and geriatrics. There is ample reference material for the clinician-scientist wishing to validate current clinical concepts. Practitioners also would enjoy the comprehensive approach provided to the universal problem of presbyopia.

Diagnosis and Management in Vision Care, John F. Amos, O.D., Editor, with 19 contributors, Butterworths, Boston, 1987, 729 pp., illus., hard-bound, $90.00.

Diagnosis and Management in Vision Care is a compendium text in the general area of primary eye care. The 22 chapters follow no classical topical outline but rather run the gamut of problems seen in the course of a routine practice. The selection of these topics appears to be based on a number of important factors. For example, problems of high prevalence in routine eye care such as refractive errors, headache, cataract, and a/pseudophakia are addressed in their current management. Potentially serious eye conditions are discussed under the headings of flashes/floaters and "the eye not correctable to 20/20." Finally, frequently troublesome problems such as dissatisfied patients, prism prescribing, malingering, light sensitivity and color testing are effectively presented.

Throughout the text a standardized format is used that presents definitions, epidemiology, etiology, signs and symptoms, examination, diagnosis, course, prognosis, and management in a logical sequence. The text is well written with good figures and helpful tables and diagnostic flowcharts.

A definite strength of this book is that it is written by individual, academically oriented clinicians who are writing about clinical problems with which they are personally very familiar and comfortable. Not only do they thoroughly discuss the related literature and theory but they provide a personal clinical perspective to the practicalities of their specific problem. This approach is incredibly

useful to the clinician who may find classical textbooks leave a great deal unsaid about the realities of management.

While not covering every aspect of eye care, *Diagnosis and Management in Vision Care* presents thorough and well organized capsule summaries of a large number of significant clinical ocular conditions. It is written for the clinician and student of eye care desiring practical advice for often difficult clinical problems.

Contact Lenses: A Guide to Selection, Fitting and Management of Complications, Susan Stenson, M.D., Appleton & Lange, E. Norwalk, Connecticut, 1987, 281 pp., illus., hard-bound, $55.

The text presents an informative overview of contact lens fitting and management. It discusses in some detail several topics not usually found in a contact lens text, but which are very useful. Several of the topics covered by this text are excellently done. The sections on patient selection and materials choice are very good, particularly the discussion of fitting rigid vs soft lenses. This selection is also very good on the characteristics of contact lens materials. The chapter on the fitting of therapeutic contact lenses is likewise excellent. It discusses the pros and cons of lenses, indications for such fits, and complications which might arise. Another highlight of the book is the chapter on refractive corneal surgery. This chapter presents a very good overview of the various procedures available and is very current on techniques.

The chapter on fitting rigid lenses presents a nice historical review of rigid lenses and manufacturing techniques. It does, however, separate fitting PMMA lenses from fitting gas permeable rigid lenses which, in the reviewer's opinion is unwise. In addition, too much space is devoted to the fitting of PMMA materials. The fluorescein pattern photographs associated with this chapter are not particularly good as they only demonstrate the extremes of base curve/cornea relationships.

The fitting of rigid permeable lenses is better discussed, but almost nothing about solutions for these lenses is mentioned. Considering that solutions can lead to a number of complications, it would have been better to expand this section considerably.

The chapter on specialized fitting techniques was quite good, particularly the discussion of keratoconus. However, not enough specific information was included about fitting high corneal astigmats and the use of bitoric lenses.

The section on complications deals mostly with soft contact lenses. The section on soft lens deposits is very good, but the section on rigid lenses is not extensive enough, especially in the area of 3-9 staining and coatings. Additionally, the recommended minimum oxygen levels and Dk/L values are out of date and too low.

Overall, this text will serve as an additional reference to the fitter of contact lenses, particularly for its excellent chapters on material not often found in contact lenses texts. It does not present a detailed and comprehensive enough coverage to be considered a basic contact lens text for the beginning student, however. It is a book to be recommended to the practitioner who desires to expand his/her knowledge into the more specialized areas of contact lens and refractive surgical management of ammetropia.

Guest Reviewer:
Roger L. Boltz, O.D., Ph.D.
University of Houston
College of Optometry

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.

Paragon's FluoroPerm® Contact Lens Wins FDA Approval

A new rigid gas permeable (RGP) lens that offers higher oxygen transmissibility and resistance to protein deposits has received recommendation from the Ophthalmic Panel of the Food and Drug Administration (FDA) for premarket clearance for daily wear. The new lens called FluoroPerm® is manufactured by Paragon Optical Inc. of Mesa, Ariz., and has a Dk of 92×10^{-11}. The lens is among the first of a new generation of fluorosilicone acrylate RGP lenses expected to be introduced within the next six months.

"The fluorine content enhances the lens' ability to resist protein deposits," said Donald J. Ratkowski, Paragon's president. "That feature, combined with the high oxygen transmissibility, makes FluoroPerm an ideal contact lens for patients who have significantly high mucoid and lipid content in their tear chemistry or those who need a higher Dk."

"FluoroPerm is an important addition to the practitioner's range of lens choices," said Peter Kastl, M.D., an ophthalmologist with Tulane University School of Medicine in New Orleans. "It provides us with the ability to fit patients in specialty situations who may not be able to wear any other type of lens."

Dr. Kastl added that clinical studies show that FluoroPerm also is indicated for situations requiring thicker lens designs. "For patients with severe astigmatism, FluoroPerm can provide improved visual acuity along with enough oxygen transmissibility for better corneal health."

While FluoroPerm offers several benefits for specific patient situations, Ratkowski noted that fluoropolymer contact lens technology is still evolving. "Rigid gas permeable technology has advanced dramatically over the last two years, largely in recognition of the fact that all eyes are not the same. As technology progresses, we'll see more specialty products developed to solve specific patient problems. This generation of fluoropolymers are the first products to really fit a specialty niche," he said.

Paragon Optical Inc. is the world leader in oxygen permable contact lens materials. Earlier this year, the company introduced Paraperm EW, the first RGP lens approved in the United States for extended wear. The company also manufactures Paraperm O_2 and Paraperm O_2 Plus RGP lenses for daily wear. □

CIBA Announces Acquisition Intent

CIBA Vision Group, a part of CIBA-GEIGY, announced that a letter of intent has been signed with The Cooper Companies, Inc., Palo Alto, California, to acquire its worldwide lens care business for $155 million dollars.

The Cooper Companies, Inc. develops, manufactures and markets automated medical diagnostic systems and reagents for the analysis of blood and other body fluids, a broad range of ophthalmic surgical products, plastic and reconstructive surgical products, and optometrically related products. Its lens care product portfolio of lens cleaners, salines and lubrication drops is complementary to the CIBA Vision product line of hydrogen peroxide disinfection systems. The worldwide sales in 1987 of The Cooper Companies' lens care products are estimated to be approximately $77 million.

This acquisition will include assets in the United States purchased by CIBA Vision Corporation of Atlanta, Georgia. Included in the transaction are all patents, trademarks, marketing and technical information and manufacturing expertise related to lens care products.

Glen Bradley, President and Chief Executive Officer of CIBA Vision Corporation, said, "The acquisition fits well with both CIBA Vision's U.S. and worldwide business goals. It is the intention to fully merge the acquired business into the CIBA Vision organization as early in 1988 as is possible to ensure an orderly transition." □

Allergan to Market New Contact Lens

The Food and Drug Administration (FDA) has granted 3M Vision Care approval to market a new gas permeable (GP) contact lens for daily wear use. Under an agreement by 3M and SmithKline Beckman Corp. (SKB), the lens will be marketed worldwide by Allergan, Inc., SKB's eye care division.

Allergan expects the 3M contact lens will set a new industry standard. It is made of flurofocon A, a proprietary fluoropolymer material designed to maintain corneal health better than any other currently available contact lens material.

Unlike other new GP lens materials, which are essentially silicone acrylate copolymers modified with small amounts of fluorine, the patented 3M lens material is a silicone-free, high-fluorine polymer that combines a number of desirable characteristics: high oxygen permeability, good wettability, visual acuity and resistance to deposit accumulation. Allergan reports that it is more flexible than other GP lenses, that it is durable and recovers well from bending. It is highly stable for consistent on-eye fit.

Allergan, Inc., a world leader in eye care, is part of SKB's eye and skin care division. This division reported sales in 1986 of $433 million; SKB sales were $3.7 billion.

Allergan, Inc., based in Irvine, CA, consists of five companies: Allergan Pharmaceuticals, manufacturer and distributor of prescription and nonprescription eye care products; Allergan Optical, leader in contact lens care products; Allergan Medical Optics, manufacturer and distributor of intraocular lenses and surgical disposables; Allergan Humphrey, the world's leading producer and distributor of microprocessor-based ophthalmic diagnostic instruments; and Allergan International, which markets the other Allergan companies' products outside the U.S. □

Optometric Education's Challenge:

AIDS in the Curriculum

Roger J. Wilson, O.D.

Abstract

The acquired immune deficiency syndrome (AIDS) is likely to be remembered as the most devastating disease of this century. This epidemic is receiving urgent attention in the fields of science and medicine. Optometry needs to join with the other caring professions by addressing the AIDS epidemic through the education of its students. A survey was taken to document what is currently being taught to optometry students. The results indicate that AIDS is receiving minimal attention at most schools and colleges of optometry. Suggestions for teaching different aspects of the disease AIDS and the human immune deficiency virus (HIV) are presented. These suggestions can be implemented by making minor modifications to certain portions of the optometric curriculum.

Introduction

The number of diagnosed cases of the acquired immune deficiency syndrome (AIDS) exceeded 30,000 in this country in early 1987.[1] The human immunodeficiency virus (HIV), previously referred to as the human T-cell lymphotropic virus Type III/lymphadenopathy associated virus (HTLV-III/LAV) is the causative pathogen of AIDS. More than 1,500,000 people in this country may already have the antibody to the HIV.[2] Antibody positivity is laboratory proof of (presumably) lifetime infection with HIV.[3] Experts estimate that as many as 200,000 people already have a diagnosis of ARC (AIDS-related complex, a less severe manifestation of HIV infection, characterized by chronic illness).[2] The Public Health Service predicts that 270,000 cases of AIDS will be diagnosed by 1991.[4]

Revised statistics from the Centers for Disease Control suggest that the numbers of cases in homosexual and bisexual men are leveling off (proportionately), but that the numbers of cases in intravenous drug users and heterosexuals (with no other known risk factors) are rising.[5]

HIV has been isolated in many body fluids and tissues including the tears, cornea, and conjunctiva.[6,7,8,9] Although there are no known cases of HIV infection which were transmitted via human tears or casual contact,[2,3,5,6] the published standards of office hygiene must be carefully applied to avoid even the most remote possibility of introducing HIV into the optometrist's working environment.[10] Likewise, when adhering to recommended infection control guidelines, there have been no reported cases of HIV infection occurring in the workplace solely due to simple close or sustained care of a patient or through nosocomial routes in a person with no known risk factors.[11,12,13] This information supports the well accepted fact that HIV is infectious, but not easily communicable.[3] It is an established fact that HIV is spread almost exclusively through infected blood or semen. HIV is also known to be spread perinatally.[2,14] The health care worker and general public have little to fear in caring for or being close to a person with AIDS as studies consistently confirm that HIV is not a casually transmitted virus.[3]

The HIV epidemic is affecting all health professions. Optometrists thus far have been relatively unaffected by the AIDS crisis primarily because people with AIDS (PWAs) are typically under medical care. Optometrists will have more patients with AIDS and ARC as the prevalance of the disease increases within the general population. Therefore, it is important that all optometrists have appropriate education about AIDS and HIV infection.

Some clinicians believe that people may be infected and asymptomatic for as long as fifteen years. As the number of these HIV positive individuals increases, the ratio of infected to non-infected people will rise in the general population. Statistically, the probability of seeing a patient with asymptomatic HIV infection, ARC, or AIDS will also rise within optometry's patient base.

In many ways AIDS is a unique disease and presents a new problem for the caring professions to deal with. It affects primarily young, productive people. Many body systems including vascular, internal organs and the central nervous system are involved. A diagnosis of HIV positivity carries with it an anxious, uncertain future with many possible outcomes.

Formal AIDS education is a new frontier for many professional training programs. One medical school recently began a separate (elective) course on AIDS to provide students with more complete information on medical and social issues.[15] The teaching of HIV infection and prevention should be given reasonable emphasis within the schools and colleges of optometry. Providing separate coursework on AIDS to optometry students is probably impractical based upon the rigorous coursework

Dr. Wilson is an associate professor of optometry and director of external clinics at the New England College of Optometry. He is also the associate director of eye care at the Dorchester House Multi-Service Center in Dorchester, Massachusetts. Dr. Wilson serves as a volunteer educator for the AIDS Action Committee of Massachusetts, Inc., in Boston.

already in place at optometry schools. However, by modifying existing coursework/lectures the educator could provide students with the information necessary to care for patients infected with the human immunodeficiency virus.

AIDS may even be a disease upon which optometric educators can build certain curricular elements. By including current information about AIDS and HIV in various coursework, the instructor could teach basic principles while simultaneously heightening student awareness of the problem. This article will provide an overview of what is currently being taught in most schools and colleges of optometry about AIDS and will discuss some elements of AIDS education which may be incorporated into existing coursework for optometry students.

Survey Results

A survey was taken of all member schools and colleges of the Association of Schools and Colleges of Optometry (ASCO). The questionnaire requested information on the number of hours devoted to AIDS education at each member institution. Space was also provided to document any pertinent information about AIDS education which the respondent wished to provide (Table 1).

1. IS THE ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS) TAUGHT AT YOUR INSTITUTION? (PLEASE CHECK ONE)
   A. YES___
   B. NO___
2. IF YES, HOW MANY HOURS (APPROXIMATELY) ARE DEVOTED TO: (PLEASE ENTER NUMBER OF HOURS)
   A. LECTURE____
   B. SEMINAR____
3. PLEASE LIST ANY OTHER PERTINENT INFORMATION REGARDING AIDS EDUCATION IN YOUR CURRICULUM.

   _____

   _____

TABLE 1: AIDS EDUCATION QUESTIONNAIRE

CURRENT STATUS OF AIDS EDUCATION

SCHOOL	OCULAR DISEASE	IMMUNOLOGY	CLINICAL MEDICINE	CONTACT LENSES	OTHER	TOTAL HRS.
1			X		X	2
2	X	X	X			5
3			X			1
4	X	X				2
5					X	?
6	X		X		X	2
7	X	X	X	X	X	2
8	X		X			1
9			X			1
10	X				X	1
11					X	1
12	X		X	X	X	2
13	X		X	X	X	12
14	X			X		1
15	X	X			X	6

TABLE 2: SURVEY RESULTS

The results were then summarized and interpreted by the author. Some survey responses were difficult to quantify, but the results did permit the author to draw some tentative conclusions.

Of the fifteen schools which responded, the results indicate that most are providing education about AIDS in ocular disease and clinical medicine. Less frequently, immunology, learning laboratories, seminars, and grand rounds were mentioned. With one exception, the schools did not specifically address the social and psychological needs of PWAs. There was only one school that mentioned teaching "safe sex guidelines." Public health and epidemiological considerations were noticeably absent. Standard disinfection procedures for the office setting and in contact lens practice were infrequently noted (Table 2).

The amount of time devoted to AIDS education in the various ASCO member institutions ranged from one hour to twelve hours. Some schools indicated that they were planning to increase the number of hours designated for AIDS education.

On the basis of these survey results, it would appear that AIDS education needs to be addressed more thoroughly at some schools and colleges of optometry, and indeed this has been acknowledged by a number of these institutions. It is proposed that certain courses be modified to provide optometry students with an appropriate background knowledge relating to ARC and AIDS. The following sections provide examples of how HIV and AIDS education might be incorporated into selected lectures and courses.

Public Health

The transmission of AIDS is well established. As mentioned earlier, HIV infection occurs primarily through a blood borne route or sexually through the introduction of infected semen into another person's system. In utero and postpartum transmission have also been reported.[1,14] Several studies have concluded that there is virtually no risk of HIV infection through close or sustained casual contact, sharing food or dishes, or in the workplace during the care of a PWA.[1,2,3,11,13,16,17] Emphasis has been placed on the need to maintain strict precautions when handling the secretions or excretions of a PWA. Body products such as urine, feces, sputum, vaginal secretions, saliva and tears may accidentally come into direct contact with the provider's blood (as in a needle

stick injury) and therefore must be considered infectious. Many authorities believe the risk of transmission by this route to be very rare, if not nonexistent.[12]

It is suggested that an overview of AIDS be presented in the first year of training to acquaint entering students with how AIDS will affect them as future primary providers of eye care. This introduction may be presented in either a public health course or coursework which reviews the entire health care delivery system. The epidemiology of AIDS should be reviewed with some historical perspective such as referring to the Bubonic Plague of the Middle Ages or the worldwide influenza epidemic which occurred during World War I. The history of HIV infection patterns could be mentioned with reference made to the proposed manner by which the virus was spread from certain sections of central Africa to other countries.[1]

In teaching aspects of AIDS transmission, one might include a listing of the high transmission behaviors and the groups most currently affected including any man who has had sex with another man since 1977, intravenous drug users, hemophiliacs, anyone who has received blood or blood by-products not prescreened for the antibody to HIV, children of parent(s) who are in a high risk group or are already at some stage of HIV infection, or any person who has had sexual contact with a person in a high transmission behavior group. The public health lectures may also include a discussion of "safer" sexual behavior. Many students may not fully understand why certain behaviors carry no risk, others are probably less safe or risky, and why some clearly increase the risk of HIV transmission. It should be understood by the students that HIV is transmitted bi-directionally.[1,18] Educating students properly about safer sexual behavior may better prepare them to answer or address questions or concerns that may be raised by their own patients.

The public health lectures might also discuss basic disinfection principles and office hygiene. Including organisms other than HIV (such as Herpes Simplex Virus, Adenovirus 8, and the Hepatitis B Virus) may help to add perspective to this material.

One final suggestion for the public health lecturer is to invite a person with AIDS to speak and share experiences with the class. This type of contact has been shown to enhance the students' understanding of the need to treat PWAs with the same care to which all patients are entitled.[15]

Basic Coursework

Certain aspects of AIDS and HIV could be included in courses such as cellular physiology, biochemistry, molecular pathology, systems physiology, and ocular physiology. The material covered in these courses might be aimed at understanding what happens to a cell, system or person when a pathogen presents itself to a host. An appreciation for what happens on a cellular level when HIV infects a person could be incorporated into a number of courses. Likewise, the biochemical nature of HIV's protein coat, an explanation of the retroviral lifecycle, and an explanation of how reverse transcriptase functions are other important aspects to consider for lecture material. Lymphotropic and neurotropic aspects of HIV infection might also be taught.

Immunology

The instructor in immunology has a unique opportunity to educate students about AIDS. It is in this area that the teacher may wish to modify existing lectures so that many principles of immunology could be taught using HIV as the basis.

The following scenario is offered as a suggestion. The normal immune system, humoral, and cellular immunity functions should be thoroughly covered so that the student will be able to under-

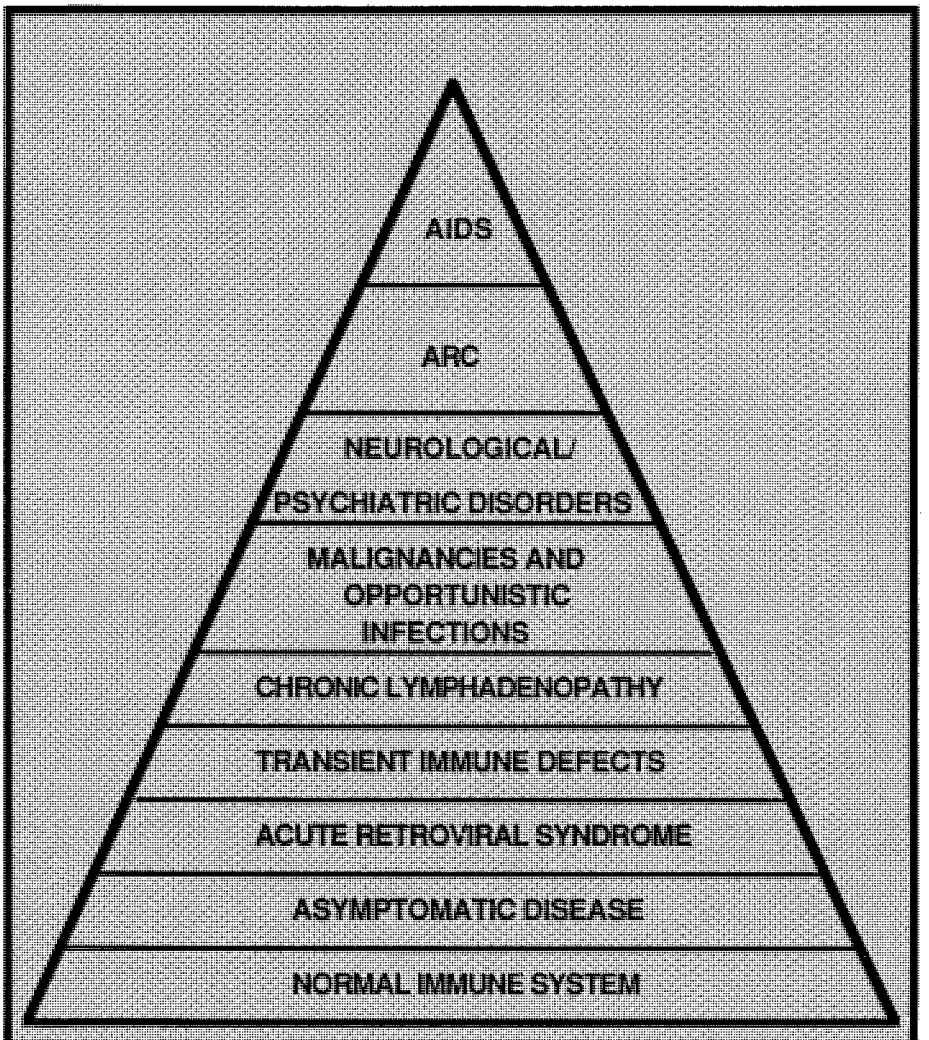

TABLE 3: PROPOSED STAGES OF HIV INFECTION
(adapted from CDC General Slide Series on AIDS #L1H1)

stand what happens when HIV or any other pathogen infects a person. HIV is known to selectively infect a class of lymphocytes known as T4 helper cells. These cells are essential to cellular immunity as they are responsible for coordinating and mounting an attack against most pathogens which enter the body.[19] If the student understands the basic immune response in a healthy person, then HIV could be used by the instructor to demonstrate what happens when the immune system becomes impaired (Table 3). By coupling this lecture material to an agent such as HIV, the teacher can provide basic information to students while simultaneously educating his/her students about why HIV poses such a threat to an infected person.

Immune complexes in an AIDS patient are believed to cause small vessel damage in the retina.[20] When the blood-retina barrier is broken, the retinal tissues are now open to infection by opportunistic organisms such as cytomegalovirus or toxoplasma gondii. The immunology material could correlate with coursework already presented in ocular disease and clinical medicine by discussing immune complex deposition in the retina. Slides of cotton-wool spots, hemorrhages, and cytomegalovirus retinitis in PWAs would illustrate why students should know immunology so that this knowledge could be applied in a clinical setting.

Clinical Medicine

The instructor in this area is encouraged to maintain continuity with the suggested immunology curriculum by amplifying the effects of the damaged immune system of the PWA and applying it to the appropriate clinical medicine lectures. AIDS could provide a model for the clinical medicine instructor to discuss the ramifications of opportunistic infections on a previously well patient. Pneumocystis carinii pneumonia, Kaposi's Sarcoma, cytomegalovirus, toxoplasmosis, non-Hodgkin's lymphoma, candidiasis and other classically AIDS associated opportunistic infections should be reviewed.[17] Various modes of treatment could also be discussed.

Psychology

This area of the curriculum probably already covers many areas germaine to a PWA's psychological condition. The teaching to students of an appreciation for interacting with a dying patient or a recently diagnosed patient with terminal illness may need a fresh look as AIDS typically strikes young people at the height of their careers. The psychology instructor may wish to consider some of the following features of AIDS when preparing lectures.

The PWA must face such potential problems as loss of a job, housing, or family. Loss of independence as the disease worsens is yet another adjustment for the PWA to make.

AIDS has recently brought the term "worried well" into the media's attention.[21] People who are in high transmission behavior groups and HIV negative persons frequently experience fear or anxiety about contracting AIDS although they have no signs of HIV infection or AIDS. Thus, they are characterized as the "worried well." The psychology instructor could discuss this process in preparing the optometry student to counsel this group of patients.

Students also need to be prepared to understand and react to a patient's anger, guilt, self-denial, depression and other feelings associated with an unfounded, tentative, or actual AIDS diagnosis.

The psychology teacher might consider using AIDS as a model problem in curriculum planning because of the wide range of psychological reactions associated with this disease. An example is the "AIDS dementia complex." (This disorder may be the only presenting sign of the disease.)[22] As more is learned about HIV infection in the brain, AIDS dementia is likely to be of greater concern to psychologists and psychiatrists. HIV is now known to infect cells in the brain and lie dormant for a number of years.[23] This latency period has profound effects on the central nervous system and will undoubtedly be a major source of discussion in the future.

Lastly, optometry students need to learn how to interact with and counsel a patient who has an opportunistic retinal infection. These infections, especially cytomegalovirus, often carry a poor visual prognosis. As in the public health lectures, the psychology teacher may wish to invite a PWA with opportunistic ocular disease to address the class.

Ocular Manifestations

The most important aspect of AIDS for optometry students is how HIV infection ultimately affects the visual system. The instructor in ocular disease is encouraged to devote ample time to a discussion of the ocular diseases associated with AIDS.

Since this disease was first recognized, experts have been aware that there are several manifestations of AIDS which cause ocular disease either through a primary or secondary process. Although researchers have identified HIV in various ocular tissues and human tears,[7,8,9] there are no known cases of AIDS which have been transmitted by contact with the eye or tears.[6]

Nevertheless, the impact of HIV on the profession is a profound one, especially because of the routine use of applanation tonometers, contact lens trial fitting sets, and gonioscopic lenses. These procedures involve the practitioner touching the eye of a patient with something that was previously used to evaluate another patient. While the likelihood of transmitting a live HIV virion from one eye to another and then into the blood system of another person is extremely small and probably nonexistent, office hygiene procedures should be consistently practiced during every patient visit. The recommended protocols for office hygiene and neutralization of HIV are well established,[24,25] but emphasis on compliance to these protocols should be emphasized to the optometry student. Unfortunately, nosocomial transmission has occurred in a few health care workers when the recommended transmission prevention guidelines were not carefully followed.[13]

Cotton wool spots should be discussed, as they are the most common lesions seen in PWAs.[26] Cotton wool spots represent infarctions of the nerve

TABLE 4: TOPICAL AREAS TO EMPHASIZE IN AN AIDS CURRICULUM
PUBLIC HEALTH
BASIC SCIENCES
IMMUNOLOGY
CLINICAL MEDICINE
PSYCHOLOGY
OCULAR DISEASE
CONTACT LENSES

fiber layer of the retina which are caused by retinal capillary damage.[26] These lesions, as well as retinal vasculature which is reportedly compromised by immune complex deposition, are the proposed conduits for retinal infection with opportunistic organisms like cytomegalovirus (CMV).[20,26]

CMV retinitis is one of the most significant types of ocular disease which can present in a PWA because of its profound impact on the visual system. This disease merits great attention in the ocular disease course. CMV retinitis may be the only presenting sign of AIDS in some patients.[27] CMV retinitis is difficult to treat and can quickly reduce visual acuity.

Other ocular diseases the teacher may wish to discuss are toxoplasmosis (which is easily acquired in a PWA as an opportunistic infection), Kaposi's Sarcoma of the eyelids and conjunctiva,[26] Herpes Zoster Ophthalmicus (as an early clinical marker) of possible HIV infection),[28] bilateral angle closure glaucoma,[29] cranial nerve palsies,[30] retrobulbar neuritis (a manifestation of unchecked neurosyphilis in some AIDS patients),[31] and retinal hemorrhages and periphlebitis.[32]

Contact Lenses

Much discussion has occurred about HIV in the tears and the potential for contaminating contact lenses. This potential has led to speculation about the possibility of transmitting HIV in the office setting.[33] The instructor in the contact lens course and laboratory could use HIV as a model organism by which to teach proper office hygiene and contact lens disinfection techniques. Even though there are no reported cases of HIV transmission by tears or contact lenses,[6] the instructor can use HIV as the extreme case in referring to the reasons why nosocomial infection control guidelines should be consistently practiced. Once students understand why there is so much emphasis on proper disinfection of contact lenses and other instruments in the office, this knowledge can be related to the anxious patient who needs reassurance about the safety of the contact lens fitting sets.

HIV is a fragile virus which is heat sensitive. It is also readily inactivated by hydrogen peroxide, isopropyl alcohol, and a 1/10 dilution of household bleach.[10,24] It is even apparently inactivated by a variety of surfactant cleaners,[34] although this method of disinfection is neither approved nor recommended.

This information could be presented in a very reassuring manner to the students, coupled with a reiteration that it makes good sense to standardize office hygiene procedures. Standardization of disinfection protocols in the office would make worrying about HIV or other infections unnecessary.

Conclusion

Optometry school curricula offer unique opportunities to integrate many aspects of AIDS education into professional training. Since optometry schools teach a wide range of coursework, this enables curriculum planners to effectively integrate diseases such as AIDS into many existing courses.

Based upon survey results, current training in AIDS amounts to only a couple of hours of lecture at most schools and colleges. It is recommended that professional training be expanded so that all pertinent AIDS related issues are fully discussed. Many courses in the optometry curriculum could be easily modified to include up-to-date information on HIV (while reinforcing general principles) along with the implications that this disease carries for the practicing optometrist.

The amount of time devoted to AIDS education should be left to the discretion of the faculty. However, if AIDS information were to be incorporated into existing coursework, it is suggested that emphasis be given to the areas addressed in this paper (Table 4).

The AIDS epidemic is one which we will all witness for many decades. It is incumbent upon us as educators to take a leadership role in AIDS awareness and prevention if we are to maintain optometry's momentum as a primary care profession.

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New Directions in Practice Management: A Model Practice Management Curriculum for Optometry Colleges

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Abstract

The University of Houston College of Optometry revised its practice management curriculum in 1982. The curriculum revision was made based on the need to change the philosophy supporting the presentation of the material and the need to improve and update the material. The paper discusses the reasons for the change, the new approach taken in presenting the material and a description of the curriculum. Student reactions and future activities related to the program also are presented.

Introduction

The changes in the delivery of health services in general and optometry in particular over the last few years have been very significant. Practicing optometrists have had to give serious thought to finding the best way to obtain and retain patients in what has become an increasingly competitive segment of the health care industry. These delivery system changes also impact the optometric training programs, ranging from the need to look at ocular disease treatment protocols to practice management instruction.

In 1980 the entire curriculum at the University of Houston College of Optometry was revised. Eight tracts (health sciences, visual sciences, optic, environmental, pediatrics, rehabilitative, primary care, and community health) were created, each being responsible for

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A modified version of this paper was presented at the December, 1986, meeting of the American Academy of Optometry.

a specific segment of the curriculum. The community health tract incorporated the more traditional public health courses as well as the practice management courses.

The practice management curriculum followed the traditional way practice management had always been taught and basically consisted of two courses. The required fourth year course, emphasizing setting up and managing the business affairs of the practice, was taught by a private practitioner who utilized outside guest speakers as appropriate. An elective course, taught by a local attorney, covered the legal aspects of practice.

Curriculum Design

In 1982, this practice of teaching the "traditional" way was evaluated. Responding to a need to upgrade the practice management program, efforts were made to reevaluate the philosophy of teaching practice management as well as revising the content. It was determined that course material should be directed to changing student attitudes in dealing with change and planning for their future with less emphasis on formal lecture material and more emphasis on projects and practicums. Course sequencing could be tied to many areas of the public health curriculum so that topics that traditionally had been in the public health area (third party, alternate delivery systems, etc.) could be integrated with practice management. It also was felt that emphasis needed to be changed in some areas. The new philosophy followed these assumptions:

1. Students should examine career goals and start planning for post graduate life during their first semester in optometry school.
2. Students should be encouraged to visit and communicate with practitioners in the community early in their optometric education and they should develop liaisons for potential associations during this time.
3. Practice management information should be taught beginning the first year; should be taught every year; and should be sequenced so that information presented in earlier years would provide a foundation to build on during subsequent years.
4. Activities in the practice management area should be primarily project or experientially oriented and students should work toward developing a "portfolio" which they can use when they graduate.
5. Material should be integrated with the community health material as much as possible.

Using the above assumptions as guidelines, the faculty reviewed all community health courses (one course taught during each of the first, second, and third years, and the two practice management courses mentioned previously). All topic areas covered in these courses were listed and the course material was sequenced throughout the four years, from the more general to the more specific. All courses were restructured with both practice management and public health information contained within each required course. New elective courses were developed to fill in specific gaps.

Generally speaking, the practice management material was organized so that the first year material covered information students needed for setting career and personal goals, and evaluating potential communities in which to practice. The second and third year material covered information students needed to know concerning practice options and how to either set up a practice or associate with established practitioners. The fourth year course covered information students needed for the day to day operation of a practice.

"One of the core assumptions was that students should be involved more in actually doing rather than listening in the practice management area."

In addition three elective courses were created: an accounting and tax course taught by a local CPA, a course in the use of computers in optometric practice and a clerkship course in which students could receive academic credit for visits to practitioner offices. Courses also were identified in other Colleges within the University (primarily the College of Business and the College of Technology) that offered courses in accounting, small business ownership, business law, etc. and students were encouraged to register for these courses. The complete curriculum, projects, and course sequencing is listed in Appendix A.

Content and Integration

In reviewing the topic sequencing through the curriculum, it was found that a number of topics applied to both the public health curriculum and the practice management curriculum. As an example, the topic of practice modes and alternatives is presented in years one, two, and three. Year one material covers an introduction to the types of optometry practice (private practice, HMOs, federal service, etc.). Year two explores the private practice mode emphasizing solo, associateship, group and partnership practice and the strengths and weaknesses of each. Year three covers the alternate delivery systems, specifically HMOs, PPOs and their impact.

Another example of a topic found in both curriculums is the financing of the delivery of health services. The public health topics addressing how policy is set in looking at costs and financing public and private delivery systems was combined with the practice management topics of how optometrists work with third party programs to receive reimbursement for services. A continuum of material is presented beginning with the broad issues of financing health care in the United States including health insurance and third party payment programs, moving to programs that affect optometry and finally addressing how optometrists contact and participate in third party programs. This includes setting up fee slips, using diagnostic and procedure codes and filing for reimbursement.

One of the core assumptions was that students should be involved more in actually doing rather than listening in the practice management area. This area is probably the only area in the optometry curriculum in which students cannot practice and in which they do not assume any degree of risk based on their decision making ability. In the clinics, students take material learned in the didactic and lab courses, practice the methods, utilize the knowledge, and assume a degree of risk based on the decisions made. This does not happen in the practice management curriculum. Students traditionally have not practiced decision making in and assumed responsibility for their actions in practice administration. Short of having students actually run a practice which is not a

feasible option, it was decided to emphasize projects and practicums so that students would feel more comfortable with the material.

Each course had one or more projects that related either to the public health and/or practice management aspects of the course. Each subsequent practice management project required the previous year's project in order to complete it. The first year projects dealt with writing resumes, setting personal and career goals, and picking a community and analyzing its potential to support a practice (or another practitioner). The second year projects required visits to private practitioners, written reports about the visits and the preparation of a bank loan application including a personal financial statement. The third year project involved developing a practice market plan. The fourth year project covered office design and office policy manuals as well as requiring the updating of all previous practice management projects within the portfolio. Throughout the curriculum, students were advised to complete the projects with the geographic location and type of practice that they intended to pursue in mind.

The intent was to have available to the students a complete portfolio they could use, with little modification, when starting out in practice. If they had decided prior to graduation what they were doing, then the exercises could be used to support their decisions and assist them in the planning phases. If they had not decided, the exercises could be used with some modification when they did decide. All projects were kept confidential.

Evaluation

The restructured curriculum was implemented in the fall, 1983 for the Class of 1987. Classes currently enrolled had modified versions of the curriculum in order to ensure that all classes received the sequencing and material in as close to the designated order as possible. For example the second year class in 1983 was required to do community needs assessments and resumes as was the entering first year class. The curriculum was modified somewhat after the first year and a half of operation with some topics resequenced.

Student reactions to the curriculum changes were interesting as they were both positive and negative. Generally students recognized the need for improvements in this area and spoke positively about the upgrading of the curriculum. Exit surveys are conducted every two years for the graduating class and showed that 86% of the respondents graduating in 1986 felt that the curriculum was adequate or exceptional versus 29% in 1981. However, it remained very difficult to orient the students to long-term planning. Many students still do not begin to look at potential practices until their third or fourth year and this attitude has yet to be completely overcome. The students have perceived an improvement in the type and depth of material covered. What is still unkown is what impact that will have on their behavior after graduation and efforts still need to be made to have students think long term.

Since many of the projects and activities were new to the students and needed to be completed over a semester, consultants were provided to the students. These were both private practitioners and individuals with expertise in specific areas (marketing, preparation of business plans, etc.). Each had office hours and was available to talk to the students about the projects and to discuss future career needs. At first, students were reluctant to meet with the consultants concerning the projects, and even fewer met with them concerning career goals. Fourth year students generally began to visit with them during the spring semester of graduation.

There was some student confusion in the beginning concerning how the curriculum fit together both from year to year and from the standpoint of combining the public health and practice management areas. This was partly due to the nature of incorporating material into existing courses during the transition and partly due to the students not having been given a review of the overall plan. Responding to the need to outline what was occurring, the faculty developed a statement of tract standards. The statement, included in Appendix A, expresses the faculty's belief that five areas are important for students to cover within the tract, one of which is practice management. Contained within the statement was a listing of every course offered by the tract, a course description, a listing of topics covered and required projects, as well as a listing when each topic would be taught in the curriculum. The statement was given to all students in the spring of 1985 and is now given to all first year students at the end of their first year.

ASCO/AOA: A Curriculum Model for PRACTICE MANAGEMENT

A joint effort of the Association of Schools and Colleges of Optometry (ASCO) and the American Optometric Association has resulted in the publication of a comprehensive curriculum model for teaching "Practice Management." This document, approved at the ASCO fall 1987 meeting, builds upon previous ASCO efforts by incorporating materials from the AOA's Professional Enhancement Program (PEP). To provide an educational framework, Bloom's Taxonomy of cognitive learning is discussed and applied to each component of the program.

This curriculum model stresses the use of teaching techniques that facilitate the transfer of learning from the classroom into practice. The authors of the curriculum model have provided not only goals and objectives but lesson plans and application problems to help the instructors of practice management incorporate the recommended teaching techniques into their own courses. The document also includes specific recommendations on how to disseminate curricular elements across all four years. By incorporating application problems and organizing the curriculum so that practice management is an issue throughout a student's four years of optometric education, students are encouraged to evaluate their life goals, both professional and personal, and develop strategies for accomplishing those goals.

The *ASCO/AOA: Curriculum Model for Practice Management* has been distributed to the deans and presidents of the ASCO member institutions. Faculty who are interested in the practice management curriculum model should inquire with the dean or president of their respective institution.

Future Activities

The curriculum revisions have improved significantly the practice management instruction. Nevertheless, the process of evaluating and modifying the curriculum continues. Efforts now are being made to continuously upgrade the marketing material in order to give more attention to the use of qualitative data (market research), to better integrate the American Optometric Association Professional Enhancement Program's Phase I and Phase II material, and to present additional material in the legal aspects of practice. In addition, efforts are being made to develop clinical management simulations in which students can rehearse running a practice utilizing the College's clinics.

The practice management curriculum traditionally has been a neglected area. Changes in this area require both a restructuring of material and a new approach to presenting the material. Students must understand that the business of optometry requires attention beginning with the first year of optometry school, requires as much attention as their clinical work and entails setting goals, planning, obtaining and retaining patients, and attention to detail as well as delivering quality care. □

Appendix A

University of Houston College of Optometry Community Health Optometry Tract Standards

Professional responsibilities in optometry include adapting, changing and being innovative, as well as remaining informed about current practices. Students completing four years of courses, exercises and field experiences in community health optometry are provided an opportunity to establish patterns for continuous professional growth and development. Through individualized, group and self-directed learning activities, students are expected to achieve competency in the following areas:

Communications: ability to write a lucid description of a scientific event, patient history or a short discourse on any professionally pertinent subject; ability to formulate and deliver a concise oral presentation on a professionally relevant subject.

Data Management: an understanding of epidemiologic and statistical principles in optometry; ability to organize and interpret both qualitative and quantitative information.

Ethics: an understanding of principles and concerns regarding patient rights and sensitivities, risks and potential abuses, and of professional and business conduct with regard to the responsibilities of the profession.

Practice Management: an understanding of optometric practice modality options and the ability to plan, pursue and develop the practice option of individual choice.

Public Health Practice: an understanding of health care delivery, health care financing mechanisms and health legislation processes in the United States and elsewhere; familiarity with contemporary public health issues involving health professionals, institutions and consumers in all health fields, as well as those of direct concern of optometry.

Community Health Optometry I

Organization and delivery of health services. Economic, legislative, and social aspects of health policy. The rationale for health services. Distribution, number, and economics of health manpower. Introduction to interpersonal relations. Ethics and social responsibility. Analyzing community vision needs and choosing a practice location.

Topic Areas

Optometric education
History and philosophy
Health manpower
Personal and professional goal setting
Assessing community vision needs
Organization of the health care delivery system
Regulation and licensing of health personnel
Socioeconomic aspects
Legal aspects/legislative change
Professional ethics
Contemporary issues
Practice modes and alternatives
Resume writing
Library use

Projects

Contemporary issues paper
Resume
Community needs assessment

Community Health Optometry II

Principles and methods of epidemiology of infectious and noninfectious diseases; concepts of incidence, prevalence, natural history, and levels of prevention. Basic principles of clinical investigations, mass screening. Concepts of validity, reliability, sensitivity, and specificity. Practice development methods.

Topic Areas

Epidemiologic reasoning
Concepts of causation
Descriptive biometry
Analytical biometry
Morbidity
Mortality
Observational studies: cross sectional/prospective
Observational studies: prospective
Experimental epidemiology: clinical
Experimental epidemiology: program/community
Vision and ophthalmic epidemiology
Vision screening
Health risk appraisal
Legal organizations
Bank loan application/references/line of credit
Buying a practice
Financing a practice
Personal financial statements
Employment contracts

Interpersonal recall
Contemporary issues
Practice modes and alternatives

Projects*

+ Community visitations
Epidemiology research design paper
Curriculum vitae/brief

Community Health Optometry III

Role of the optometrist in health education, prevention and health maintenance. Government and third party roles in the organization, delivery, financing, and evaluation of health care. Methods of quality assurance in health care and uses of quality assurance systems.

Topic Areas

Financing health care
Medicaid/medicare
Third party vision care
Health education
Quality of care/records management and referral mechanisms
Professional ethics
Contemporary issues
Practice modes and alternatives
Consumer involvement in health care
Vision screening
Health planning
Marketing professional services
Leasing

Projects*

+ Locating a practice site within a community
Bank loan application
Market plan
Health education project

Community Health Optometry IV

Managing a practice. Detailed practical aspects of managing and succeeding in practice. Legal aspects, malpractice, and liability issues. Office design. Insurance. Office procedures and personnel management. Collection and money matters. Accounting and bookkeeping. Patient marketing, retention, and development. Computerization.

Topic Areas

Quality of care/records management
Marketing professional services
Leasing
Identification and design of office
Personnel management/delegation
Office policies and procedures
Insurance considerations
Coping with competition
Public and professional relations
Credit and collections
Dealing with labs and suppliers
Preserving practice value
Determining fees
Office automation
Introduction to computers
Development and maintenance of a basic accounting system
Monitoring and evaluating financial performance and health
IRS forms and procedures
Basic income tax
Using professionals
Contemporary issues
Regulation and licensing
Socioeconomic aspects
Legal aspects/legislative change

Projects*

Complete Portfolio
- Personal and professional goals
- Financial information
- Resume/references
- Market plan
- Loan proposal
- Office policy manual
- Office design

Community Health Clinic (Externship)

Patient care provided in an interdisciplinary health care setting. Clinical environments are external to the campus in hospitals, health centers, prepaid care facilities, extended care centers, home health services to special populations and ambulatory care centers. Practice in various areas of community health and a community health project completed.

Advanced Practice Management-Financial Aspects of Practice (Elective)

Introduction to basic accounting concepts, income tax preparation and financial management of the optometric practice. Accounting definitions, establishing practice financial records, financial goal setting and planning, understanding and evaluating practice financial statements, basic income tax law and income tax preparation, IRS reporting requirements, tax, financial, and estate planning. Open to second, third, and fourth year students.

Topic Areas

Development and maintenance of a basic accounting system
Monitoring and evaluating financial performance and health
Managing resources
IRS forms and procedures
Structure and organization of the IRS
Basic income tax
Income tax for business
Personal and financial tax planning
Investment terminology
Using professionals
Basic investment philosophy
Types of financial institutions and how to use them
Types of investment (real estate, oil, and gas, etc.)

Computer Use in Optometric Practice (Elective)

Introduction to computer terminology as it applies to the optometric office. Evaluating optometric software; concepts in understanding the capabilities of hardware and software. Introduction to uses of computing as a practice management tool. Limited class size—open to second, third, and fourth year students.

Topic Areas

Introduction to computer terminology
Hardware considerations
Evaluating optometric software
Communications and clinical computing
Word processing applications
Financial spreadsheet applications
BASIC programming

Clerkship (Elective)

Introduction to private practice through observation and participation in the day to day aspects of conducting a practice. Emphasis placed on practitioner/patient interaction and the business and economic aspects of private practice. Open to second, third, and fourth year students.

Projects*

Activity log
Observation time
Practice project

**Projects are due no later than the end of the semester in which the course is scheduled.*

+ This project may be worked on prior to the start of the semester in which the course is taught.

Reference

Association of Schools and Colleges of Optometry Project Team on Professional Development Curriculum. Professional Development and Administration. Journal of Optometric Education. 1978 Fall; 5(2):18-24.

Interpersonal Skills Training for Optometry Students: What Should be Taught?

Briony M. Thompson, Ph.D.
Jan E. Lovie-Kitchin, MSc.Optom.

Abstract

In recent years, greater recognition has been given to the need to systematically train optometry students in specific interpersonal skills. One difficulty facing the teacher responsible for such a program is to decide what skills need to be taught. It is the purpose of this paper to review research on health professionals' interpersonal skills and to provide a theoretical basis for the selection of material to be included in a program for optometry students. From this basis, specific recommendations on the necessary skills will be made.

Introduction

Communication between the optometrist and patient is a vital part of the optometric examination. Traditionally, it has been assumed that interpersonal communication skills are natural assets—either an optometrist has them or does not—and that this 'art' of optometric care could not be taught.[1,2] However, there is now a well-established body of literature detailing specific skills that can be taught, together with the methods of teaching these interpersonal skills to health professionals. A number of papers[1-6] have discussed programs designed to teach optometry students more effective communication skills. However, few of these papers have examined the interaction between the optometrist and the patient with a view to identifying the specific interpersonal skills which should be taught. This paper examines the importance of interpersonal skills and recommends the specific skills necessary to achieve the goals of the optometrist-patient interaction. It is not intended to give details on the methods of teaching these skills, as this has been done excellently elsewhere.[7]

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"Some research indicates that interpersonal skill is actually the primary criterion used by patients to judge quality of care."

Interpersonal Skills and Patient Satisfaction

Evidence has accumulated that a health professional's technical competence, while necessary for effective patient care, is not sufficient to ensure desired patient outcomes such as satisfaction and compliance.[8] There is a substantial body of research indicating varying degrees of dissatisfaction reported by patients. Ley[9] has summarized various investigations of patient satisfaction and reported median percentages of dissatisfaction ranging from 35% to 53% of patients. In a major investigation of 800 mothers attending a pediatric clinic, Korsch and Negrete[10] found 24% reported dissatisfaction and Fitzpatrick and Hopkins[11] found 36% of a patient sample at a neurological clinic to be dissatisfied. Thus, while the percentage of dissatisfied patients varies according to patient population, health care service and measure of satisfaction used, it would seem that about one third of patients are dissatisfied with the interactions they experience. There are no published data on the satisfaction or dissatisfaction of patients attending optometrists; but as a primary health care profession, it is likely that the findings for optometry would be similar to those from general medical practice.

The problem of dissatisfaction would not be so critical to the delivery of health care if patient satisfaction were not related to treatment outcomes. In particular, patient satisfaction has been demonstrated to predict compliance rates. Korsch and Negrete[10] found 53.4% of highly satisfied patients complied with instructions whereas only 16.7% of highly dissatisfied patients did so. In a review of the literature on patient satisfaction, Ley[9] noted that patient satisfaction with the consultation, satisfaction with communication and general satisfaction with medical care received correlated with compliance.

Interpersonal skill in interactions with patients is a determinant of patient satisfaction. Korsch and co-workers[12] found patients reported more satisfaction

when pediatricians appeared friendly (i.e. expressed warmth), explained well, answered questions and were skilled communicators. Patients also were more satisfied when the nature and cause of their child's illness was explained. In this study pediatricians commonly failed to elicit their patients' main concerns and worries (these were elicited for only 29% of patients) with two results—patient dissatisfaction and inability of patients to listen.[12] When health professionals presented information using techniques developed from memory research and readability measures, patients understood more, recalled more and were more satisfied.[13-15] Physicians' affective behavior (allocating sufficient time, showing interest in the patient and devotion to solving the problem) was found by Ben-Sira[16] to be correlated with patient satisfaction.

In a study of verbal interactions between patients and physicians in a university hospital screening clinic, Stiles et al.[17] found patient satisfaction to be related to the opportunity to tell the story in their own words during the medical history and to direct feedback about the illness, while being allowed to ask clarifying questions. Willson and McNamara[18] had college students view videotapes of simulated doctor-patient interactions while imagining they were the patient. They found doctor courtesy to be correlated with student reports of satisfaction. Ryan[19] in a survey of dissatisfied ophthalmic patients found that many of the complaints arose from "careless haste and poor communication." He cautioned practitioners to: "beware of over-confidence, fatigue, hurry, ill-temper; to find out why glasses are needed and to explain how they are to be used."

Some research indicates that interpersonal skill is actually the primary criterion used by patients to judge quality of care.[16,20-22] For example, Doyle and Ware[22] found 'physician conduct' to be the most important factor in predicting patient's general satisfaction with medical care, accounting for nearly two-thirds of the variance in the six factors they studied. Hirsch and Wick[23] quote a patient: "I would not think of having a doctor (of optometry) I didn't like. The reason has nothing to do with professional competence, which I cannot judge anyhow . . . I do want my doctor to listen very carefully to what I have to say; to tell me every bit he can about what he is looking for and what he finds; and when he doesn't know, say so." This is supported by the findings of Ben-Sira[16] that dissatisfied patients were more likely to seek alternative care offering higher emotional support, than seek that offering greater technical competence. However, in a simulated doctor-patient interaction, students were able to distinguish extremes of competence and competence was also related to satisfaction.[18] Thus it is recognized that low levels of competence also predict dissatisfaction.

Bennett[24] reported on two surveys of patients who had failed to return to their original optometrists. The most prevalent reason for switching optometrists was not that the patients had moved from the area as might be expected, but was dissatisfaction with the attitude of the optometrists and the optometrists' lack of communication. After patients had switched optometrists, they believed their new practitioners were more attentive, explained things better and understood their problems and fears. Unfortunately, there is evidence that the majority of people who are dissatisfied with a service will not return to complain to the provider of that service.[25] So dissatisfied patients usually will be lost to the original optometrists.

The research on the relationship between interpersonal skills and patient outcomes may be summarized as follows:

Good interpersonal skills result in—

- More satisfied patient
- Patient perceiving the optometrist as more competent
- Patient giving more information
- Patient more trusting of optometrist
- Patient being less anxious about examination procedures
- Patient being more able to tolerate discomfort
- Patient recalling more
- More patient complying
- Patient being less likely to seek alternative care.[26]

The Optometrist-Patient Interaction

Argyle[27] presented a model of social skills which postulates a number of analogies between social behavior and the performance of motor skills like driving a car. In particular, social skills are learned behaviors and are directed by particular goals that the person has in performing that behavior.[27] An optometrist interacting with a patient will pursue goals at varying levels of specificity. For example, general goals would be to solve the patient's visual problem and to achieve patient satisfaction and compliance with the advice. To do so, however, more specific goals need to be met.

For the purposes of this analysis, it will be assumed that an optometrist will wish to achieve three specific goals in interaction with a patient. The goals are:

- to establish or enhance the relationship between the optometrist and patient;
- to obtain information from the patient which will assist in the assessment and diagnosis of the presenting problem;
- to present information to the patient in such a way that the patient understands and can recall the information.

A review of the specific skills relevant to each of the three goals follows.

Enhancing the Relationship with the Patient

The first of these goals is stated in a very general way. Specifically, what are the elements of such a relationship? A number of authors (e.g. Gerrard et al.[7]) refer to the importance of trust in the relationship between a health professional and patient. One framework for exploring skills related to the establishment of trust comes from the area of counseling. Rogers[28] postulated three conditions which must be present in a therapist-client relationship: empathy, congruence and warmth. Empathy means putting yourself in the patients' shoes and understanding what their experiences mean to them. Thus, an empathetic optometrist is able to see things from the patient's perspective.[29] It should be noted that empathy is not the same as sympathy, which refers to "feeling for" the patient (e.g. feeling sorry for the patient who is losing vision). Congruence is also critical to the relationship, as it refers to the match between the optometrist's feelings and actions. An optometrist who is disinterested in a patient but pretends interest is being incongruent and would be perceived by the patient as not "genuine." Gerrard et al.[7] note that "when a patient thinks you care about him and take the time to understand his feelings and concerns, he will be more likely to trust you, confide in you, and comply with your treatment plan." Sanson-Fisher and Poole[8] have demonstrated that changes such as increased empathy may promote the health professional/patient relationship. In their studies, Sanson-Fisher and Poole used a standard empathy training program and observed that students

were closer to patients, used more appropriate language, matched their voice tone to that of the patient and dominated the interaction less.

It would be useful then, to restate the first goal in more specific terms as: to demonstrate empathy, congruence and warmth in the interaction with the patient.

To some extent the goal of empathy is achieved through the use of the appropriate interviewing techniques discussed below.[8] It would be expected also that presenting information in a more understandable form would enhance patients' perception of the optometrist's interest and concern. Korsch and co-workers[12] found patients to be more satisfied when pediatricians explained well and were skilled communicators. Following ophthalmological examinations, Trobe et al.[30] asked patients to rate the importance of 11 "communication" items. Three explanation items, "explains diagnosis," "explains treatment" and "explains prognosis" were considered the most important communication items leading to satisfaction with the ophthalmological examinations, followed by "gives full attention" and "deals with patient concern"; it was suggested by the authors that "shows empathy" did not rate highly because patients misunderstood the meaning of the term.

Perceptions of the health professional's warmth are a central determinant of patient satisfaction.[10,12,31] In one study,[17] 50 percent of outpatients listed kindness, interest, sympathy and encouragement as the most important attributes of a physician. One difficulty in teaching warmth is the lack of an agreed-on operational definition of warmth.[32] However, Gerrard et al.[7] emphasize the use of non-verbal behaviors, such as:

- maintaining eye contact,
- facing the patient squarely,
- leaning slightly forward,
- presenting an open posture,
- smiling, nodding and using a 'warm' tone of voice.

Gerrard et al. present a rating scale covering such specific behaviors, as well as a rating scale based on subjective perceptions of observations, which is useful as a training device.[7]

In practice, it may be difficult to assess differentially the effects of warmth and empathy on patient satisfaction as both skills will lead patients to perceive the optometrist as more caring and sensitive. However, it is important to train students in both; accurate understanding without perceived warmth, or warmth without understanding would mitigate against the establishment of a trusting relationship.

Obtaining Information from the Patient

It is during the case-history that the optometrist aims to establish a rapport with patients and to encourage them to fully describe their visual problems. Initially, the optometrist must be prepared to listen to patients give information in their own words. The practitioner must clarify the patient's understanding of terms which have quite clear, specific meanings to the optometrist, such as blur or double vision.[33,34] By appropriate responses, the optometrist must shift patients from vague generalizations (e.g. I'm having trouble seeing in the distance) to specific, concrete examples of their visual difficulties (e.g. I cannot read the print on the blackboard when I sit at the back of the lecture theatre). If the information obtained is accurate, the optometrist will conduct the appropriate tests, gather relevant findings, be able to confidently explain to the patient the reason for the problem and give advice on a course of action to solve the problem. The following skills are required during the consultation.

"In one study, 50 percent of outpatients listed kindness, interest, sympathy and encouragement as the most important attributes of a physician."

Listening to Patients

To obtain information from patients, the optometrist must listen. According to research, most health professionals believe they spend more time listening to their patients than talking to them.[32] This assumption is contradicted by research reported by DiMatteo and DiNicola,[32] which indicates that doctors generally talk more than their patients. The authors note that this is surprising in view of a physician's major goal of obtaining information from patients. It is difficult to specify the correct proportion of time an interviewer should talk; but within limits, the less said the better.[35]

A patient may fail to provide relevant information because the optometrist interrupts too readily, produces inappropriate non-verbal cues (such as failing to maintain eye contact) or quickly fills in any silences with comments not specifically related to those of the patient. Hale[36] suggests that it is a serious mistake to cut patients off when they are talking about their visual conditions. Dangott and co-workers[37] found that health professionals tended to use disconfirming messages (e.g. contradicting patients' statements regarding the level of pain they experienced) and this tended to inhibit patient response.

Discussion of other specific listening skills useful in the optometric consultation can be found in Bennett.[5] To encourage more input from patients, use of two basic verbal skills—open questions and reflection—is required of the optometrist.

Using Open Questions

Open questions are those questions that open up, rather than close off, conversation. Specifically, they require the respondent to give more than a 'yes/no' answer to a question. Harris[38] and Bennett[5] note that open questions elicit more information than questions leading to restricted replies, because they allow patients to express in their own words, their ideas on particular problems. For example, a patient would be asked, "How would you compare the new glasses to the previous ones?" (open question) rather than, "Do you like the new glasses?" (closed question). Likewise, the patient would be asked, "Tell me about your headaches," rather than "Do your headaches occur in the morning or the evening?" Closed questions are often "leading" questions ("You don't get sore eyes at work, do you?")

Using reflection

Reflection is fundamental to the concept of "active listening." Reflection has two functions: to demonstrate interest and concern to patients and to facilitate the accuracy of listening. Basically, reflection is a skill in which the optometrist feeds back to the patient what he/she understood the patient to say.

The idea is not to parrot back what the patient says; rather the optometrist expresses his/her understanding as a means of clarifying and checking accuracy. Done in a natural way, it requires expressing the content (and when appropriate, the feeling) of the message in the optometrist's own words. For example, if a patient said, "These glasses help me see a lot better, but I feel funny about wearing them because I look so different," the optometrist might reply, "You feel uncomfortable about wearing them even though you realize they are helping you."

Allowing patients time to respond

Korsch and Negrete[10] found that if patients were allowed to tell their stories in their own words, they were more satisfied. Giving patients time to respond to questions or instructions, monitoring patients' non-verbal cues for signs that they wish to say something more and deliberately encouraging patients to ask questions, all indicate that the optometrist is receptive to information and interested in the patients.

Skills such as active listening, appropriate non-verbal behavior, use of open questions, reflection, paraphrasing, summarizing and awareness of the patient's non-verbal behavior[5,7] are skills fundamental to the success of the conduct of a case-history. These skills are difficult to assess individually so comments can only be made on the impact of interviewing skills per se, on obtaining information from patients and on the relationship with patients. As indicated previously, Sanson-Fisher and Poole[8] used the Accurate Empathy Scale (which requires students to learn to respond accurately towards content and feeling expressed) as a training device and found significantly improved demonstration of empathy, reflected in skills such as more appropriate non-verbal behavior and interviewing skills. Goldberg and co-workers[39] trained medical students in general practice in interviewing skills, including appropriate non-verbal behavior, clarifying verbal and non-verbal cues and demonstrating empathy; they found increased skill to be correlated with better ability to diagnose psychiatric problems.

Giving information to patients

Patients require information from the optometrist during and following the examination. During the examination patients are given brief explanations of the procedures and at the conclusion, the examination findings are explained and the treatment advice is given.[30,40] Information must be presented to patients in a manner that enhances understanding and recall. Problems of patient understanding and recall are detailed by Ley,[9] who notes that on the basis of behavioral tests, 53% to 89% of patients do not understand what they have been told and that investigations of patient recall suggest a percentage of information forgotten varying from 28% to 71%, depending on methodology. Cassata[41] noted that instructions and advice are more likely to be forgotten than any other information. The following suggestions of techniques to improve patient understanding and recall are based on the work of Ley.[9,14]

"One way to enhance recall is to provide written material to patients. An obvious simple recommendation is to avoid the use of jargon and use shorter words and sentences."

Enhancing recall

A number of different techniques can be used during interactions with patients to enhance recall.

- Repetition

  Ley[14] notes that use of repetition leads to increased recall. However, he recommends another technique, known as explicit categorization, for producing a smoother interaction and providing equivalent results.

- Explicit categorization

  This is based on the finding that clustering of information enhances recall. The optometrist provides categories of information to the patient, for example saying:

  "I am going to tell you —
  what is wrong with your vision,
  what the treatment will be,
  what additional tests will be necessary,
  what you must do to help yourself,
  and what the outcome will be.
  Now first, what is wrong
  . . .
  Secondly, what the treatment will be
  . . ."[14]

  Ley[14] found that this technique increased recall in volunteers from six to nine of 15 statements and in patients increased recall of diagnostic information from 60.5% to 66.7% and recall of advice from 28.3% to 65.4%.

- Primacy and importance effects

  Patients recall best what they are told first and what they consider most important.[14,41] Ley[14] compared three groups of outpatients. The first received a 'normal' presentation, the second received advice before any other information and the third had the importance of advice stressed. Percentage recall was 44, 75, and 64% respectively. However, recall of advice may be accompanied by decreased recall of other material and therefore the use of additional techniques is advised.[14]

- Specific information

  Perceived importance of information is a determinant of recall and it was noted by Ley[14] that specific information was accorded more importance than general information. Bradshaw et al.[42] found specific instructions regarding dieting resulted in a recall rate of 51% compared with 16% for general instructions. So for example, the contact lens patient would be instructed to "disinfect your contact lenses before bed each night," rather than "clean your lenses once a day."

Decreasing complexity of material

One way to enhance recall is to provide written material to patients. An obvious simple recommendation is to avoid the use of jargon and use shorter words and sentences. In addition, when preparing written material for patients, a specific measure of complexity can be used to assist in producing simpler material. The Flesch Formula measures the readability of prose and is calculated by:

$$\text{Reading ease} = 206.83 - 0.85W - 1.02S$$

where W = average number of syllables per 100 words, and
S = average length of sentence in words.

Thus, short words and short sentences contribute towards easier reading (higher score). The higher the score, the

greater the percentage of the population who would understand the material and the more meaningful the material is assumed to be (for more details see Ley[14]). While urging some caution in the interpretation of high scores, Ley[14] notes that low scores indicate a problem and advises health professionals to routinely apply readability measures to any written material prepared for patients.

Ley[9] summarizes investigations of 85 leaflets prepared for patient populations and notes that 28% of leaflets would be understood by one quarter or less of the population, 41% by 26 to 40% of the population, 11% by 41 to 74% of the population and 20% by more than 75% of the population. French and coworkers[43] examined 38 ophthalmic pamphlets, books and documents used by optometrists in Britain. They found that 27 pamphlets (71%) could be classed as difficult or fairly difficult and would be understood by only 40% or less of the population. Only 2 leaflets were in the easy category. As French et al.[43] conclude, explaining vision problems in 'words of one syllable' may not be easy, but ophthalmic literature should aim at more than half the population, because simplifying materials, reflected in higher readability scores, does enhance patient recall.[42] Ley[14] reports on studies which indicated that better understanding of pamphlets is reflected in higher compliance. Of course, reading ease is not the only factor to consider; Reed and Hoffmann[44] have shown that pictorial cues can also help to enhance patients' recall of instructions or information.

There are a number of techniques recommended then for enhancing patient recall and understanding, i.e. using repetition, explicit categorization, presenting the information to be remembered first (primacy effect), stressing its importance and presenting simple material using shorter words and sentences and/or pictures). The use of such techniques is an important adjunct to interviewing skills in ensuring effective two-way communication between patients and optometrists.

Conclusion

It has been argued that effective interpersonal skills are critical to patient satisfaction and compliance. The choice of skills to be included in any educational program, however, is best guided by an examination of those goals the optometrist wishes to achieve. Developing a trusting relationship, obtaining information from the patient and presenting information to the patient all require different subsets of skills. The systematic practice of such skills, first in isolation and then as an integrated sequence in simulated or real patient interviews, provides a sound basis for improving the "art" of optometric care. □

References

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Optometric Grand Rounds

John C. Townsend, O.D.
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Abstract

In order to augment the training of our Veterans Administration Optometry Residents and rotating Southern California College of Optometry interns, an educational program was developed at the West Los Angeles Veterans Administration Medical Center-Brentwood Division. It consists of clinical patient examination with subsequent case discussion followed by a formal lecture which corresponds with the ocular and systemic diseases previously presented. At the end of each block lecture series, a written test is given for which transcript quality continuing education is provided.

Introduction

In January 1986, the Optometry Service at the Brentwood Division of the Veterans Administration, West Los Angeles, in concert with the Southern California College of Optometry (SCCO) began a grand rounds approach for clinically educating VA residents. Prior to that, most education was provided via individual case discussions with the interns and residents. The problems that their patients presented with had determined the clinicians' clinical experience. For the SCCO interns, that experience was limited to a seven to eight week rotation.

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Dr. Selvin is chief, Optometry Service, Veterans Administration Medical Center, West Los Angeles and assistant professor at the Southern California College of Optometry.

The first session was held when a patient was scheduled with previously diagnosed Usher's Syndrome. The attending resident wrote a summary sheet in the SOAP format which was distributed to all interns, residents and staff after which the case was orally summarized. After everyone had examined the patient (approximately 30 minutes after the presentation), staff, interns, and residents reconvened and discussed the patient's findings as well as the other possible differential diagnostic implications. Afterwards, an informal lecture was given.

Developing the Optometry Basic and Clinical Science Course

In February, 1986, a letter was written to the Southern California College of Optometry with a formal schedule requesting transcript quality continuing education credit for the Optometric Grand Rounds. In April, approval of the request was received from the dean of academic affairs.

During the intervening months from February to April, the rounds were refined organizationally since it takes a team approach to make them run smoothly. The Wednesday afternoon schedule was cleared for Grand Rounds. During general clinic sessions, patients were screened and scheduled for rounds presentation according to their systemic and ocular diseases.

A sign-in sheet for doctors and interns was created for each lecture. Residents or interns who presented patients at the rounds would dilate and prepare them

for examination at 1:00 p.m. Patients were selected with conditions related to the course syllabus. At approximately 1:15 p.m., residents, interns and staff would gather in the large teaching room. The residents and interns would orally present their patients to staff after having distributed a typed sheet with a SOAP format summary. Ideally, three patients are examined at each rounds. After everyone is familiar with the cases, each patient is individually examined, a procedure which takes about 45 minutes to one hour. Residents, interns and staff reconvene and discuss the findings, determine a definitive diagnosis of the patient's condition, probe other possible differential diagnoses and determine what additional tests need to be ordered (i.e., cerebrovascular profile, laboratory tests, etc.).

Since SCCO approved transcript quality continuing education credits, it was incumbent upon the Optometry Service to maintain a standardized high quality level of continuing education. This was accomplished by establishing the "Optometric Basic and Clinical Science Course" as the syllabus for the Brentwood Veterans Administration Optometry Service's Grand Rounds. At 3:00 p.m., a two hour formal lecture related to the disease topic of that day (according to the course syllabus) is presented. After a subject area is completed, a multiple choice test written in the IAB format is given to residents, interns and staff. Those doctors who successfully pass the test are granted transcript quality continuing education credit by the Southern California College of Optometry. After grading the test, the questions and answers are discussed.

The Optometry Basic and Clinical Science Course was formalized in June 1986 for the optometric residency program commencing on July 1, 1986. It consists of a total of 136 hours of clinical and didactic education in systemic and ocular disease. The course is a systematic approach of clinical presentations of specific subject areas followed by a formal lecture expanding the in-depth coverage of that particular disease. With a location in the largest Veterans Administration Medical Center, the Optometry Service is able to draw upon the expertise of nationally recognized experts who contribute to the Grand Rounds educational experience. The Rounds approach has given guest lecturers a positive image of optometry in general and particularly the West Los Angeles Veterans Administration's Brentwood Optometry Service.

Optometric Grand Rounds have been well received by SCCO interns as an integral part of their clinical education experience. For example, the fall rotation saw every stage of diabetes mellitus from early to advanced with systemic and ocular manifestations as well as the ocular and medical management. The most interesting patients are logged in the Optometric Grand Rounds patient file index box for future rounds. Fortunately, these patients are extremely helpful and willing to participate in the Rounds to help educate future doctors. The veteran patients are the true unsung heroes of the Optometry Service's Grand Rounds development.

TABLE 1

OPTOMETRY EDUCATION PROGRAM

Optometry Service

West Los Angeles VAMC - Brentwood Div.
August 6, 1986 to June 26, 1987
John C. Townsend, O.D., Coordinator

Optometric Grand Rounds

1:00 to 2:30 — Optometry Clinical Conference
Patient Presentation and Examination

2:30 to 3:00 — Optometry Clinical Conference
Patient Discussion

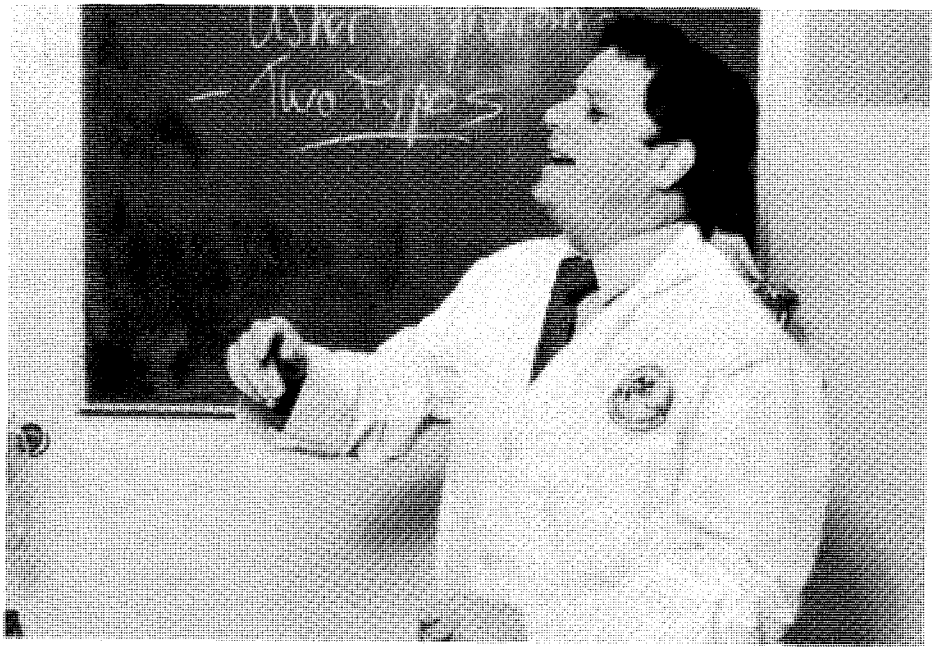
3:00 to 5:00 — Optometry Basic and Clinical Science Course

OPTOMETRY BASIC AND CLINICAL SCIENCE COURSE

Conducted as a series of discussions, lectures, and demonstrations by members of the resident staff and faculty, this program is designed to present the essential core of optometric knowledge in a manner conducive to learning and retention. To achieve this objective, each of the sections of the core curriculum contains related aspects of basic and clinical science and is accompanied by a self-assessment procedure. The latter enables the course participants to evaluate knowledge and problem solving ability during the learning process.

As an educational program, this course serves primarily as an adjunct to optometry residency training.

All VA optometry residents and all SCCO residents are invited to attend Grand Rounds. Written approval must be received from the Chief, Optometry Service (Brentwood Division) and Chief of their facility.



The Optometry Basic and Clinical Science course (Optometric Grand Rounds) was primarily developed as a strong component of the education of optometry residents at the Veterans Administration Medical Center, West Los Angeles, Brentwood Division.

The optometric staff at Brentwood Veterans Administration felt that residency education needed standardization within a context of a specific array of disease states. Although residents continue to carry a heavy clinical load throughout the medical center, the opportunity to have a weekly intensive four hour session on specific disease entities has greatly enhanced the knowledge base that the Brentwood optometry residents leave the program with at the end of their residency. This, in turn, has been demonstrated to make them better clinicians.

A graphic demonstration of what is being discussed above has been the nearly five-fold increase in the initial diagnosis of thyroid eye disease after the thyroid rounds. This resulted in increased endocrine consultation with subsequent medical management. The three patients with different stages of thyroid eye disease whom the residents and interns examined contributed significantly to the greater awareness of this condition.

In recent years, the International Association of Boards of Examiners in Optometry (IAB) has developed a certification process to validate competence in disease management. One advantage observed with Brentwood Optometry residents is that after completing the rigors of the Optometric Basic and Clinical Science Course, their success on IAB certification has been 100%. It would be interesting to follow the relationship of IAB scores to the Brentwood Optometry Grand Rounds Program. Since the current trend is for residents to complete IAB certification before entering the program, the sample will probably remain too small to be useful.

Summary

A coordinated Grand Rounds approach to clinical education integrated within a Basic and Clinical Science course better prepares interns and residents for the changes and challenges they will experience in the practice of optometry. The confidence gained from hands-on clinical experience with a variety of serious ocular and systemic disease conditions results in the earlier recognition, diagnosis, treatment and management of these disorders. □

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TABLE 2

Optometry Basic & Clinical Science Course (136 Hrs)

August 6, 13, 27	Anterior Segment	Drs. Townsend/Selvin
September 3, 10	Vascular Disease	Dr. Townsend
September 24	Thyroid Disease	Dr. Townsend
October 1 & 8	Gonioscopy & Its Disorders	Dr. Selvin
October 15, 22, 29	Diabetes Mellitus	Dr. Townsend
November 5, 12	Peripheral Fundus Disorders	Dr. Selvin
January 7, 14	Age Related Macular Disease	Dr. Selvin
January 21	Dermatology	William V. R. Shellow, M.D.
February 4	Geriatric Vision	Marilyn Gilbreath, O.D.
February 11	Geriatric: Summary of Aging	Thomas Yoshikawa, M.D.
February 18, 25	Systemic and Ocular Neoplastic Disease	Dr. Selvin
March 4, 11, 18	Glaucoma	Dr. Townsend
March 25	Congenital Anomalies Which Mimic Glaucoma	Dr. Townsend
April 1	Management Of The Post Surgical Patient	Dr. Selvin
April 15	Management of Emergencies and Urgencies	Dr. Selvin
April 5, 22, 29, May 6	Neuro-Optometry	Dr. Townsend
May 20, 27	Retinopathies Due to Systemic Disease	Dr. Selvin
June 3, 10	Congenital Anomalies	Dr. Townsend
June 17	Ultrasonography	Dr. Townsend

A Simulation of Amblyopia

Michael W. Rouse, O.D., M.S.Ed., Alan M. Winkelstein, O.D.
Julie M. Ryan, O.D., M.S.Ed., Garth N. Christenson, O.D.

Introduction

A significant portion of an optometric student's pre-clinical training is provided in laboratory settings where the major educational goal is usually directed towards developing the student's psychomotor skills. Typical pre-clinical laboratory experience, for example in strabismus/amblyopia diagnosis, requires students to administer diagnostic techniques on fellow students who rarely have the vision condition being investigated. Unfortunately, this frequently creates a less than optimum learning experience. In this type of learning environment, students also do not become familiar with actual patient responses or the consequences of the vision condition on the patient's "world." Active student participation is promoted, but the lifelike relevancy is ignored. This experience can lead to an attitude of simply "going through the motions."

Simulations have been used in health care education to provide students experience with a realistic model of the actual condition being studied. These simulations can range from using simple physical models[1] to complex computer programs emulating the patient-doctor encounter[2,3]. Although teaching simulations have been fairly prominent in the literature of other health care professions, there have been surprisingly few teaching simulations reported in the optometric educational literature.[4,5]

"The students felt the simulation served to increase their awareness of the way amblyopic patients 'see,' . . ."

To bridge the gap between laboratory experience and the actual clinical evaluation of patients with amblyopia, the following simulation is currently being used in a pre-clinical laboratory in strabismus/amblyopia diagnosis. This simulator was patterned after the VisTech 6500 Contrast Sensitivity Testing System's[a] demonstrator haze glasses.

The Simulation

A simulation of decreased visual acuity was developed by mounting a thin sheet of semi-opaque plastic (Frost King Heavy Gauge Plastic Sheeting #P350)[b] in a 35 mm slide holder. The simulator provides a decrease in visual acuity and contrast sensitivity which parallels that reported for amblyopes.[6,7] Table 1 shows traditional full chart Snellen visual acuities at 6M with and without the simulator. Figure 1 presents psychometrically measured (S-Chart[c]) visual acuities with and without the simulator. Figure 2 demonstrates the change in contrast sensitivity produced when viewing through the simulator. By varying the number of layers of plastic film, further reduction in visual acuity and contrast sensitivity can be produced. In addition, inconsistencies in the plastic's density produces variable visual acuity and contrast sensitivity reductions depending on where the subject views through the slide, allowing for variations among students in each laboratory. This also creates some of the same difficulties reported for amblyopes when visual acuities are taken, such as uncertain endpoints.[8]

The Laboratory Curriculum

The course in Strabismus/Amblyopia Diagnosis at the Southern California College of Optometry consists of a 4 hour lecture per week combined with a 4 hour per week lab. The laboratory time is organized into a 45 minute presentation/demonstration of the diagnostic techniques by the lab instructor. The students practice for 2-3/4 hours and then a 1/2 hour discussion is conducted at the conclusion to answer questions and resolve problems.

Dr. Rouse is an associate professor, lecturer/lab instructor for the course, Diagnosis of Strabismus/Amblyopia, and the chief of the Vision Therapy Service at the Southern California College of Optometry.

Dr. Winkelstein is a clinical instructor and lab instructor for the course, Diagnosis of Strabismus/Amblyopia.

Dr. Ryan is an associate professor/lab instructor for the course, Diagnosis of Strabismus/Amblyopia and the chief of the Pediatric Vision Care Service at the Southern California College of Optometry.

Dr. Christenson is a clinical instructor and lab instructor for the course, Diagnosis of Strabismus/Amblyopia.

Behavioral Objectives

The behavioral objectives for the laboratory on assessing visual acuity of the amblyope are:

The students will be able to:

1. Demonstrate each diagnostic technique in the following list, using the steps detailed in the "Strabismus/Amblyopia: Diagnostic Techniques" manual[9] and demonstrated by the instructor:
   a. Visual acuity assessment using Snellen Chart
   b. Visual acuity assessment using S-Chart (psychometric visual acuity chart)
   c. Visual acuity assessment using Tumbling Es with contour interaction bars
   d. Pinhole visual acuity
   e. Contrast sensitivity assessment using the VisTech 6500 System
   f. Grating acuity assessment using the Site Iras™ Interferometer[d,10]
2. Demonstrate the ability to make appropriate observations and/or to achieve appropriate results with each technique by properly recording the observations and/or results, according to the instructions in the "Strabismus/Amblyopia: Diagnostic Techniques" manual and demonstrated by the instructor on the Strabismus/Amblyopia Diagnostic Data Base.
3. Demonstrate, by using a simulation slide, and describe the condition of amblyopia to patient, parents and other interested parties.

Table 1
Traditional full chart Snellen visual acuities at 6M with and without the simulator.

	SNELLEN VISUAL ACUITY FULL CHART @ 6 m		
A. ≡ SIMULATOR (Rx Only)	20/15		
B. ONE LAYER	20/40 +	NO IMPROVEMENT ≡ PINHOLE	
C. TWO LAYERS	20/100	NO IMPROVEMENT ≡ PINHOLE	

Learning Experience

With this simulation the student was to act first as the doctor, then the patient, and proceed through the clinical assessment of a patient suspected of having amblyopia. The student was instructed to proceed as if the refractive status had already been assessed and corrected. The student was to conduct the following assessment of visual acuity:

1. Full chart, line and letter Snellen acuity

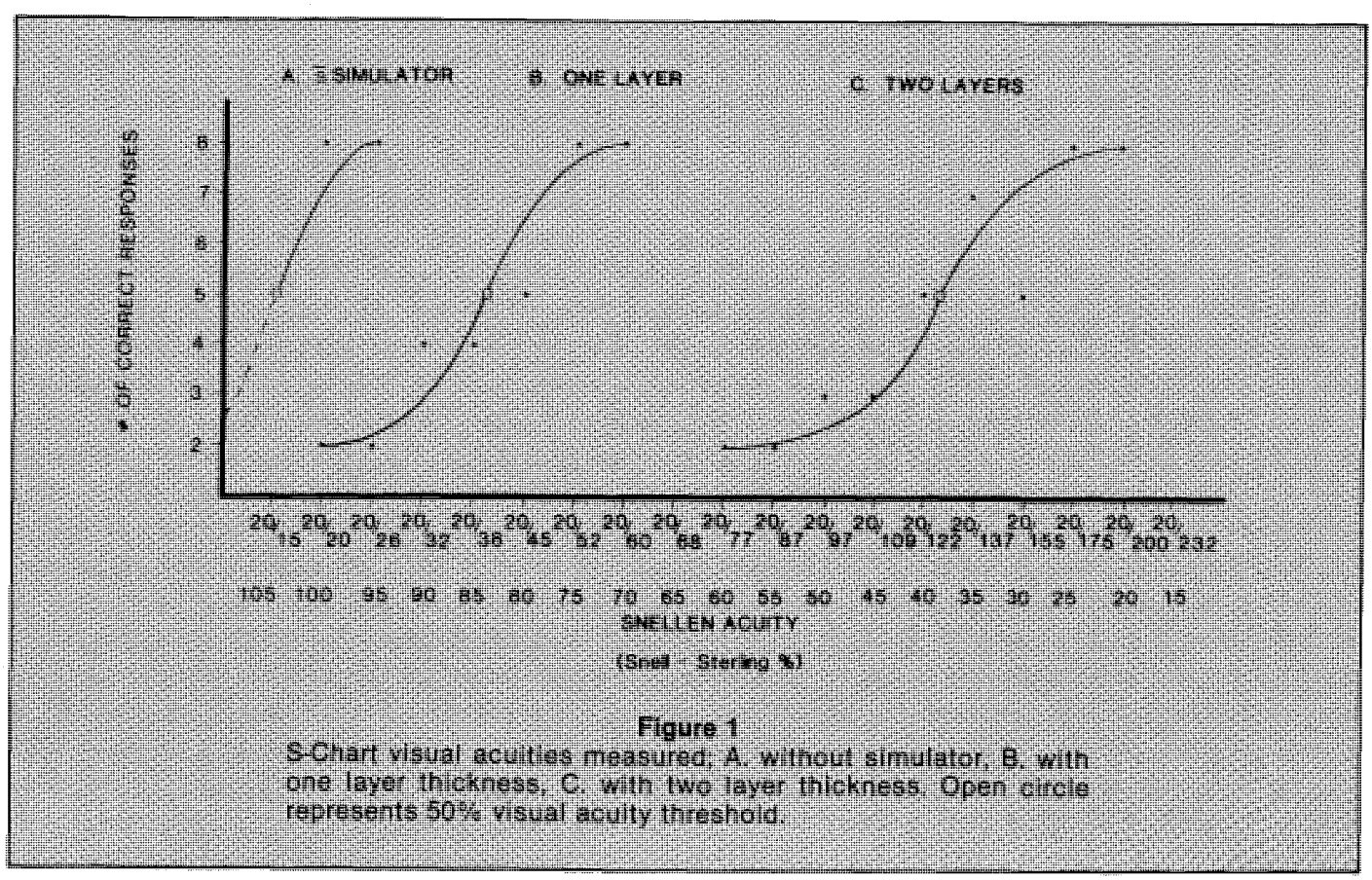

Figure 1
S-Chart visual acuities measured; A. without simulator, B. with one layer thickness, C. with two layer thickness. Open circle represents 50% visual acuity threshold.

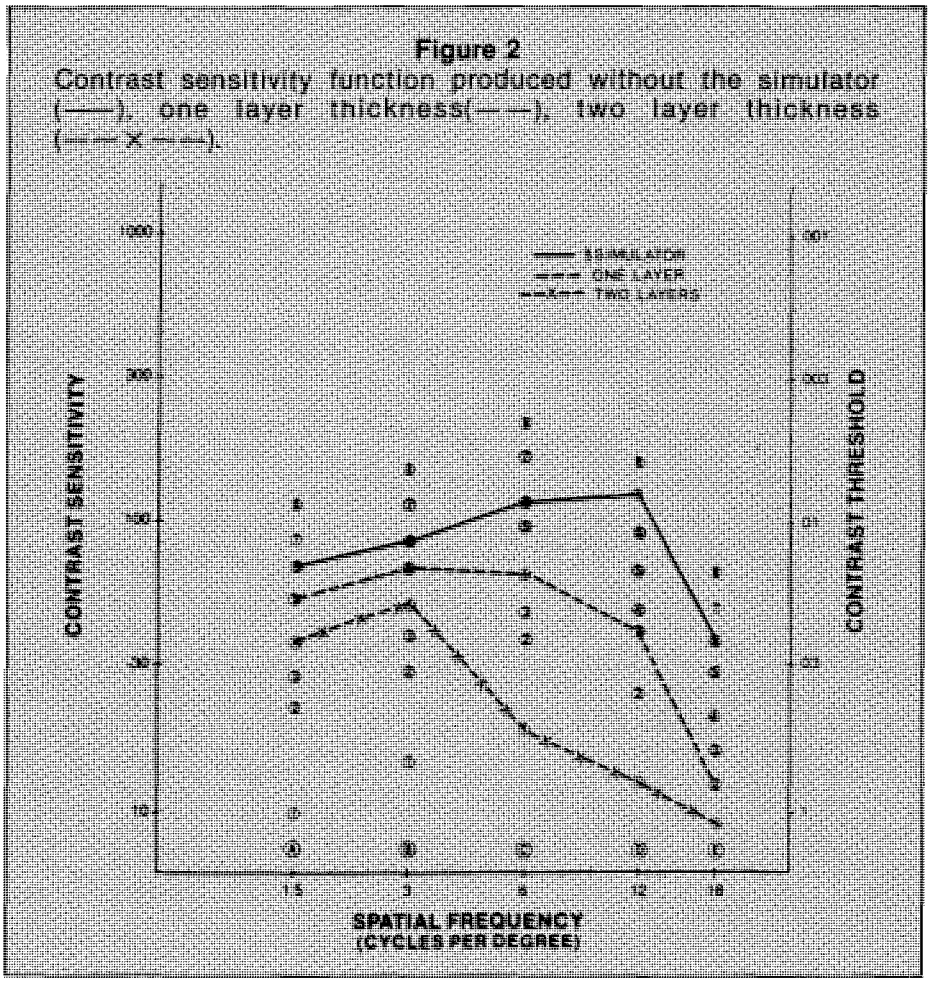

Figure 2
Contrast sensitivity function produced without the simulator (——), one layer thickness(— —), two layer thickness (— — x — —).

2. Pinhole acuity
3. S-Chart acuity
4. Tumbling Es with contour interaction bars acuity
5. Contrast sensitivity function using VisTech 6500 System
6. Grating acuity using a Site Iras Interferometer

Student Reaction

The students felt the simulation served to increase their awareness of the way amblyopic patients "see," and provided a much more realistic learning experience than simply administering the diagnostic procedures to their non-amblyopic colleagues. One of the students in the lab who was amblyopic commented that vision with the simulator filter over her good eye closely paralleled her amblyopic eye's vision.

Conclusions

One of the principal roles of the instructor is to develop stimulating learning experiences which involve the student as an active participant. This is an important principle because, "Learning takes place through the active behavior of the student; it is what he does that he learns, not what the teacher does."[11]

This simple demonstration shows the power of simulations in creating a more realistic learning experience and developing greater student interest toward learning important diagnostic procedures.

The authors see no reason why this type of simulation could not be extended to:

- Simulation of decreased visual acuity in low vision conditions.
- Give students practice refracting patients unable to obtain 20/20 visual acuity in each eye.
- Simulate decreased visual acuity conditions, such as amblyopia, for patient education of parents, school nurses and teachers.
- Simulate the effect of ocular media opacities. □

Footnotes

Equipment and materials are available from:

a. VisTech Consultants, Inc.
1372 North Fairfield Road
Dayton, OH 45432

b. Thermell Products Company, Inc.
Patterson, NJ 07524

c. Multimedia Center
School of Optometry
University of California
Berkeley, CA 94720

d. SITE Microsurgical Systems, Inc.
135 Gilbraltar Road
Horsham, PA 19044

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Curriculum Model for Oculomotor, Binocular, and Visual Perception Dysfunctions

Prepared for the Association of Schools and Colleges of Optometry under a grant from the College of Optometrists in Vision Development by a committee appointed by ASCO. The curriculum was adopted by ASCO's Board of Directors at its March 1987 meeting. The Board recommended that the model be considered by member schools for implementation and application.

Members of the committee were: Nathan Flax, M.S., O.D., State University of New York, State College of Optometry, Chairman; Ralph Garzia, O.D., University of Missouri-St. Louis School of Optometry; J. David Grisham, O.D., M.S., University of California—Berkeley—School of Optometry; Jack E. Richman, O.D., New England College of Optometry; Michael W. Rouse, O.D., M.S., Ed., Southern California College of Optometry; Mitchell M. Scheiman, O.D., Pennsylvania College of Optometry.

Foreword

This committee was appointed in December 1985 by ASCO President Edward R. Johnston to develop a curriculum model in the area of "Behavioral Vision." In his charge to the committee, Dr. Johnston noted that the parameters of "Behavioral Vision" were not well defined and he indicated that the committee might wish to use a different title. This indeed proved to be the case.

The members wished to avoid having to choose from among terms such as "Behavioral Vision," "Developmental Vision," "Functional Vision," and a number of other labels currently in use within the profession of optometry. It became apparent that almost all of what is currently being done by optometrists in the area of interest could comfortably be discussed under the headings of diagnosis, management, and prevention of oculomotor, binocular, and visual perception dysfunctions. We then conducted our internal deliberations under the acronym OBVPD (Oculomotor, Binocular, and Visual Perception Dysfunctions).

The curriculum model which evolved encompasses a broad area of optometric practice—an area where optometry has capability to meet significant public needs. Disorders of oculomotor control, binocular vision, and visual perception have a prevalence rate second only to refractive conditions and far greater than most ocular diseases.[1-5] Graham[6] reports overt strabismus in almost 4% of over 4000 school children. Among clinical cases, Fletcher and Silverman[7] found 8% of 1110 to be strabismic. Other studies have generally found rates between these two levels.[8]

The reported prevalence of amblyopia varies somewhat depending upon the specific criteria used, with low estimates at approximately 2%,[9] and ranging up to 8.3% in the Rand HIE report[10] and also in the study by Ross, Murray and Stead.[11] The National Society to Prevent Blindness estimates 127,000 new cases of amblyopia per year in the United States.[12]

Non-strabismic anomalies, not surprisingly, have a higher incidence. Convergence insufficiency is reported in 15% of adults by Duke-Elder.[13] Graham[6] reports high heterophorias in over 13%, while Hokoda[14] found fusion or accommodative problems in 21%. When "special" populations are considered, the incidence of ocular coordination and visual perception problems becomes very high. Among children who are reading disabled, as many as 80% show deficiency in one or more basic visual skills.[15,16] The recently developed New York State Optometric Association Screening Battery probes oculomotor, binocular, accommodative and visual perceptual function. Testing of 1634 children found a deficiency rate of 53%.[17] Grisham[18] has recently reported that children with reading problems showed greater than 50% prevalence of visual deficiencies in accommodation, fusional vergence or gross convergence, compared to their normally achieving peers. Patients with cerebral palsy show an incidence of strabismus as high as 50%.[19,20] Visual perception difficulty is almost endemic among youngsters with minimal brain injury or attention deficit disorder.[21] Learning disabled children also show very high rates of visual perception deficiency.[22-24] The hearing impaired,[25,26] emotionally impaired[27] and developmentally disabled[28,29] also demonstrate unusually high prevalence of visual problems. This is of particular importance because almost 11% of the school population has been identified as having one of the above handicapping conditions.[30] These populations alone will require a continued supply of properly trained optometrists who are knowledgeable in the areas covered by this curriculum model.

Our culture continues to demand higher educational standards and our economy requires more visually demanding jobs. This is evident in the difficulties encountered by video display terminal operators. A majority of surveys have reported that more than 50% of VDT workers indicated that they occasionally experienced some type of ocular discomfort or blurring.[31,32] The National Academy of Sciences[33] concluded that the oculomotor and binocular vision changes noted are similar to those that occur during standard near-point tasks. However, patients with oculomotor, binocular, or visual perception problems can no longer be

offered treatment only if they experience overt discomfort. Professional accountability requires normalization of visual performance, an objective that cannot always be achieved with refractive correction alone.

Optometry, which has proven capacity to ameliorate oculomotor, binocular and visual perception disorders, should now be rededicating its resources to assure proper training of its students to meet the enormous public need in this domain. Vergence, oculomotor, and accommodative and visual perceptual anomalies can be successfully treated.[34-43] Optometric treatment of strabismus using vision therapy is more effective than surgery in properly selected cases.[44] Many cases of amblyopia are treatable[45,46] independent of age.[47] In 1984 the American Public Health Association recommended that health insurance plans offer the patient freedom of choice between orthoptics and surgery for the treatment of strabismus and amblyopia.[48]

The area encompassed by this curriculum model should not be diminished as other aspects of optometric practice capture the attention of optometric educators. This curriculum model is presented to assist in the preparation of future optometrists. Optometry developed and grew as a result of leadership in dealing with oculomotor, binocular and visual perception dysfunctions. It would be shortsighted to expand the scope of practice in other areas at the expense of our traditional strengths. The knowledge base in these domains has grown enormously, and the public need for the services that flow therefrom has grown even more. Forty-three states specifically mention orthoptics, vision therapy, or some synonym in their licensing laws. Definitions of optometry offered by The Institute of Medicine of the National Academy of Sciences, The Dictionary of Occupational Titles of the Employment and Training Administration, the Public Health Service, the National Society to Prevent Blindness, the Department of Labor, the National Center of Health Statistics, the Bureau of Labor Statistics, the Department of Health and Human Services, and the Association for Academic Health Centers include vision therapy. We define optometry to include this aspect of practice. Others do the same. The optometric educational establishment can do no less than assure that optometry graduates are fully prepared to provide the necessary services.

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Goal #1
Knowledge of the basic physiology of ocular motility and accommodation.

The student will be able to:

I. Locate and identify the structures of the oculomotor system, to include:
- A. intrinsic and extrinsic muscles
- B. neurological pathways
- C. supportive orbital structures
- D. cranial vascular system

II. Recall the physiological principles of the oculomotor systems, to include:
- A. coordinate systems
- B. actions of the extraocular muscles
- C. principles of eye movements
  1. Listing's Law
  2. Donder's Law
  3. Hering's Law
  4. Sherrington's Law
- D. dynamics of eye movements
  1. muscle forces
  2. mechanics of eye movements
  3. controller signals
- E. micro eye movements of fixation
- F. control theory of versional eye movements
  1. smooth pursuit movement system
  2. saccadic movement system
  3. independence of pursuits and saccades
  4. vestibular-ocular reflexes
  5. optokinetic nystagmus
  6. coordination of head and eye movements
- G. sensory factors in eye movements
  1. stabilized images
  2. saccadic suppression
  3. visual attention
- H. scanning and visual search
- I. eye movements in reading
  1. normal
  2. reading disorders
  3. dyslexic
- J. anatomy of the accommodative system
- K. neurological control of accommodation
  1. stimuli to accommodation
  2. control theory and models
- L. anatomy of the pupillary system
- M. neurological control of the pupil

III. Describe the neuropathology of oculomotor disorders and their clinical manifestations, to include:
- A. nystagmus
- B. eccentric fixation
- C. oculomotor paresis
- D. influence of pharmacological agents
- E. sequelae of local and systemic pathology

IV. Recall the sequence of oculomotor development landmarks to include:
- A. fixation
- B. smooth pursuit
- C. saccades
- D. OKN
- E. accommodation

Goal #2
Knowledge of the basic physiology of binocular vision.

The student will be able to:

I. Locate and identify the neuroanatomical structure underlying the vergence eye movement system.

II. Recall the physiological principles of the binocular vision system, to include:
- A. Maddox classification of vergences
- B. heterophoria types
- C. triad-accommodation, convergence, pupil interactions
- D. synkinesis of accommodative convergence and convergence accommodation
- E. disparity (fusional) vergence
- F. control models of vergence eye movements
- G. zone of clear, single binocular vision
  1. relative convergence and divergence
  2. relative accommodation
  3. variations in zone characteristics
- H. fixation disparity
  1. relation to heterophoria
  2. relation to vergences
  3. relation to stereopsis and space perception
  4. variations with stimulus parameters
- I. binocular sensory fusion
  1. fusion theories
  2. Panum's fusional areas
  3. relation between sensory and motor fusion
- J. suppression and retinal rivalry
- K. stereopsis
  1. theories of stereopsis
  2. random dot stereopsis
  3. relation to interpupillary distance
  4. relation to viewing distance
- L. development and age related changes in binocular vision
- M. postural influences on binocular function
- N. models of phoria-vergence relationships

III. Describe the neuropathology of vergence eye movement disorders and their clinical manifestations, to include:
- A. comitant and non-comitant strabismus
- B. binocular correspondence
- C. suppression
- D. efficient stereopsis
- E. influence of pharmacological agents
- F. sequelae of local and systemic pathology

IV. Recall the sequence of vergence developmental landmarks to include:
- A. accommodative vergence
- B. tonic vergence
- C. fusional vergence
- D. near point of convergence

Goal #3
Knowledge of the basic physiology of visual perception.

The student will be able to:

I. Identify and describe the neuroanatomical structures underlying the perceptual system, such as:
- A. sustained and transient channels/cells
- B. complex, hypercomplex, and simple cells

II. Recall the basic physiological principles of the visual perception system, to include:
- A. pattern (form) perception
  1. information theory
  2. feature analysis
  3. Gestalt theories of pattern perception
- B. color perception
- C. movement perception
  1. perceiving self orientation and motion

2. perceiving object motion
D. *distance perception*
1. monocular clues to depth judgments
2. binocular clues to depth judgments
E. space perception
1. sources of information
2. monocular direction references
3. monocular spatial asymmetries
4. constancies and adaptations
5. spatial distortion with prisms and lenses
6. theoretical horopter
7. singleness horopter
8. disparity and the horopter
9. stability of correspondence
10. aniseikonia and the horopter
11. spatial distortions in strabismus
F. developmental and age related changes in visual perception

III. Describe the neuropathology of the visual perceptual system and its clinical manifestations, to include:
A. dyslexia
1. acquired and developmental
B. dysgraphia
C. minimal cerebral dysfunction

Goal #4
Knowledge of the development of perceptual-cognitive function and intersensory integration.

The student will be able to:

I. Recall the main features of models of perceptual-cognitive function including:
A. brain injury
1. *Goldstein*
2. Strauss and Lehtinen
3. Cruickshank
B. cerebral dominance
1. Orton
2. Doman and Delecato
C. perceptual motor/intersensory integration
1. Kephart
2. Getman
3. Ayres
4. Barsch
5. Frostig
6. Gibson
7. Birch
D. cognitive development
1. Kirk
2. Piaget
3. Held
4. Gesell
E. attention and memory

II. Recall developmental landmarks to include:
A. sequence of normal development
1. physical growth
2. intellectual and cognitive growth
3. sensory motor function
B. variations in normal development
1. developmental delay concept
2. at risk concept

Goal #5
Knowledge of the epidemiology of oculomotor, binocular, and visual perception dysfunction.

The student will be able to:

I. Define and differentiate the following epidemiological concepts:
A. absolute-relative risk
B. prevalence-incidence
C. sensitivity-specificity
D. false positives-false negatives
E. prospective-retrospective studies
F. phi coefficient

II. Recall the prevalence and incidence of the following conditions:
A. non-strabismic vergence dysfunctions
B. *oculomotor dysfunction*
C. accommodative dysfunction
D. strabismus
1. esotropia
2. exotropia
3. cyclovertical
4. non-comitant
E. amblyopia
F. visual perception dysfunction
G. visual motor integration dysfunction

III. Recall causal factors in the genesis of refractive, *oculomotor, binocular vision and visual perception* dysfunctions, to include:
A. genetic
B. environmental
C. pathogical
D. idiopathic

Goal #6
Knowledge of the public health features of oculomotor, binocular, and visual perception dysfunctions.

The student will be able to:

I. Construct a screening program to identify oculomotor, binocular vision and visual perception dysfunctions.

II. Describe and evaluate the results of the screening program within the framework of the epidemiology of oculomotor, binocular and visual perception dysfunctions.

III. Differentiate and discuss the strengths and weaknesses of the various vision screening methods available for the *oculomotor, binocular vision and visual perception* dysfunctions, such as:
A. Modified Clinical Technique
B. stereoscopic instruments
C. acuity testing with optotypes
D. random dot stereopsis
E. Denver Developmental Inventory
F. Rosner Perceptual Skills screening
G. NYSOA battery
H. other commercially available batteries

IV. Identify and utilize appropriate vision screening follow-up *care services including appropriate referral for oculomotor,* binocular vision and visual perception dysfunctions.

V. Utilize epidemiological data of the relative frequency of occurrence of oculomotor, binocular and visual perception dysfunctions in given clinical samples as a means of evaluating quality assurance of patient care.

VI. Explain the influence of oculomotor, binocular and visual perception dysfunctions on the efficient performance of visually related tasks.

Goal #7
Knowledge and demonstration of diagnostic methodology and analysis for oculomotor, binocular, and visual perception dysfunctions.

The student will be able to:

I. List the steps for performing a task analysis.

II. Perform a task analysis to identify the visual needs and requirements of specific performance activities in the following general areas:
A. academic skills
B. athletic skills
C. occupational skills
D. avocational skills

III. With information provided on the patient's performance, predict, verbally or in writing, possible visual deficits which might contribute to decreased patient performance in the following areas:
A. academic tasks
B. athletic tasks
C. occupational tasks

D. avocational tasks

IV. Based on literature, list the behavioral signs and symptoms associated with oculomotor, binocular and visual perception dysfunction deficits on academic, athletic, occupational and avocational performance.

V. Conduct a clinical interview, elicit and record the following information:
- A. patient's/parent's chief complaint
- B. signs and symptoms
- C. behavioral patterns of avoidance
- D. patient's visual requirements for occupational, vocational, recreational and educational needs
- E. remarkable patient and family eye history
- F. remarkable patient and family medical history
- G. remarkable academic history
- H. remarkable social history
- I. remarkable pre-natal, neo-natal and post-natal developmental history
- J. remarkable prior evaluation and treatment provided by other professionals

VI. List all possible diagnostic hypotheses to account for the patient's entering chief complaint, signs and symptoms, based upon epidemiological and clinical characteristics of oculomotor, binocular, and visual perception dysfunctions.

VII. Outline an initial examination strategy to probe for the presence of oculomotor, binocular, and visual perception dysfunctions including:
- A. refractive status
- B. visual acuity
- C. ocular and visual pathway integrity
- D. ocular motility
- E. accommodation
- F. binocular status
- G. visual perceptual motor development

VIII. *Based upon the history and an initial examination,* the student will demonstrate the ability to evaluate the following functions:
- A. refractive status
  1. non-cycloplegic
  2. cycloplegic
- B. visual acuity
  1. inferential methods
  2. optotype
  3. grating
  4. electrophysiological testing
- C. ocular and visual pathway integrity
- D. ocular motility
  1. fixation accuracy
  2. saccadic eye movements
  3. pursuit eye movements
  4. spatial localization
- E. accommodation
  1. amplitude
  2. relative
  3. facility
  4. accuracy
- F. binocular status
  1. strabismus
  2. heteroporia
  3. concomitancy
  4. fixation disparity
  5. vergence
     a) disparity
     b) tonic
     c) relative
     d) facility
  6. sensory fusion
     a) correspondence
     b) second degree
     c) stereopsis
     d) spatial localization
     e) SILO
- G. visual/perceptual motor development
  1. visual perception
     a) visual discrimination
        1. laterality
        2. directionality
        3. form orientation/size
        4. color
  2. visual figure ground
  3. visual closure
  4. visual memory
     a) sequencing
     b) visualization
  5. visual attention
- H. intersensory integration
  1. visual motor integration
     a) fine motor coordination
  2. auditory visual integration

IX. Select age appropriate diagnostic procedures, and describe each diagnostic test's theoretical basis, administration and proper recording, to include:
- A. preferential looking procedures
- B. electrodiagnostic procedures
  1. VEP
  2. ERG

X. Demonstrate the ability to administer oculomotor, binocular, and visual perception diagnostic procedures, record and interpret their results.

XI. Apply multiple analysis systems to the data collected to include:
- A. oculomotor
  1. normative and/or criteria referenced data
- B. binocular vision
  1. graphical analysis
  2. normative data analysis
  3. OEP analysis
  4. fixation disparity analysis
  5. sensory aspects
- C. visual perception
  1. normative and/or criteria referenced data

XII. Establish a diagnostic category which may include one or more of the following:
- A. *accommodative dysfunction*
  1. insufficiency
  2. excess/spasm
  3. infacility
  4. fatigue
  5. paralysis/paresis
- B. oculomotor dysfunction
  1. position maintenance
  2. deficiency, saccadic eye movements
  3. deficiency, pursuit eye movements
  4. nystagmus
- C. non-strabismic binocular vision disorders
  1. convergence insufficiency
  2. convergence excess
  3. divergence insufficiency
  4. divergence excess
  5. basic exophoria
  6. basic esophoria
  7. hyperphoria/cyclophoria
  8. anisophoria
  9. fusional convergence dysfunction
     a) amplitude
     b) facility
  10. fusional divergence dysfunction
     a) amplitude
     b) facility
  11. fixation disparity
  12. gross convergence insufficiency
  13. suppression/sensory fusion deficiency
  14. deficient stereopsis
  15. aniseikonia
- D. OEP case types
  1. embedded B cases
  2. minus projection
  3. non-malingering syndrome
- E. strabismus
  1. esotropia
     a) congenital
     b) accommodative
     c) developmental
     d) acquired
     e) cyclic
     f) microtropia
     g) basic
     h) divergence insufficiency

i) convergence excess
j) intermittent
k) constant
l) comitant
m) non-comitant

2. exotropia
a) congenital
b) developmental
c) acquired
d) microtropia
e) basic
f) divergence excess
g) convergence insufficiency
h) intermittent
i) constant
j) comitant
k) non-comitant

3. cyclovertical
a) hyper/hypo deviations
b) AV syndromes
c) dissociated vertical deviations
d) primary overactions
e) congenital
f) developmental
g) acquired
h) intermittent
i) constant
j) comitant
k) non-comitant

4. syndromes
a) Duane's
b) Brown's
c) strabismus fixus

F. amblyopia
1. stimulus deprivation
2. strabismic
3. refractive
4. anisometropic
5. psychogenic

G. eccentric fixation

H. nystagmus
1. congenital
2. latent
3. blockage syndrome

I. visual/perceptual dysfunction
1. visual discrimination
a) laterality
b) directionality
c) form orientation/size
2. visual figure ground
3. visual closure
4. visual memory
a) sequencing
b) visualization
5. visual attention

J. intersensory integration
1. visual motor integration
2. fine motor coordination
3. auditory visual integration

XIII. Generate a new hypothesis list and updated examination strategy if a diagnosis cannot be established.

XIV. Communicate, verbally and/or in writing, diagnostic results, case analysis outcome, and potential management plans to the patient/parent and/or other professionals.

Goal #8
Knowledge of the interactions between educational, psychological, social, and physical factors and oculomotor, binocular, and visual perception dysfunctions.

The student will be able to:

I. Recall the literature discussing the signs, symptoms, patterns of avoidance and subsequent consequences on learning of problems in the following areas:
A. visual acuity
B. refractive error
C. eye health
D. accommodation
E. binocularity
F. ocular motility
G. visual perception

II. Describe the primary function of educational and psychological testing, to include:
A. intelligence tests
B. projective tests
C. developmental tests
D. educational and achievement tests
E. auditory and linguistic tests

III. Describe how the optometrist would utilize the results from educational and psychological testing to include:
A. effect on prognosis
B. effect upon referral decisions
C. effect upon expected treatment outcome
D. effect upon transfer to educational performance

IV. Conduct a clinical interview, elicit and record information about educational factors which may be related to oculomotor, binocular and visual perception dysfunctions such as:
A. current grade level
B. overall school performance
C. educational strengths and weaknesses
D. reading level, specific nature of reading problem
E. math level
F. spelling level
G. handwriting skills
H. attention and concentration skills
I. behavior
J. educational remediation
K. previous educational testing/results

IV. Describe the signs, symptoms, and consequences on the *optometric evaluation caused by problems in the following* areas:
A. disorders of self image/concept
B. malingering
C. hysterical amblyopia
D. schizophrenia
E. neurotic disorders
F. anxiety about school performance
G. demands of school, occupation, or avocation on development of visual system
H. family status

VI. Conduct a clinical interview, elicit and record information about psychological factors which may be related to oculomotor, binocular and visual perception dysfunctions such as:
A. family status, i.e. divorce, single parent, siblings
B. behavioral/emotional problems
C. family attitudes
D. motivation for treatment

VII. Describe the clinical characteristics of special populations, to include:
A. physically handicapped
B. developmentally disabled
C. deaf and hearing impaired
D. behavior disorders
E. specific learning disabilities
F. *reading disability*

Goal #9
Knowledge and skill to design and implement a management plan for oculomotor, binocular, and visual perception dysfunctions.

The student will be able to:

I. Determine the significance of the following risk factors in the management of oculomotor, binocular vision and visual perceptual dysfunctions:
A. age
B. sex
C. race
D. environmental
E. genetic
F. vocational

G. educational
H. socio-economic
I. psychological
J. nutritional
K. general health

II. Compare the efficacy of vision therapy versus other modes of therapy, including surgery, for conditions for which alternative modes of treatment might be recommended. This comparison must include a description of criteria for success, and the student must be able to document this information by citing appropriate reference material.

III. Based upon epidemiologic data, communicate to patients/parents verbally or in writing the alternative treatment approaches available for the particular condition, including:
A. no treatment
B. lenses
C. prism
D. occlusion
E. modification of environment
F. vision therapy
G. education about nature and natural course of the disorder
H. consultation with other professionals

IV. List the clinical findings which would suggest that eyeglasses might be an appropriate form of treatment and write a proposed Rx based upon these clinical findings.

V. List the clinical data and case history findings which suggest that modification of the environment is appropriate in order to manage the diagnosed condition.

VI. List the specific conditions for which vision therapy, or vision therapy in combination with some other treatment modality, would be recommended as the most appropriate treatment approach.

VII. Design a specific optometric management program including information about prognosis, sequence of treatment, specific treatment procedures, estimated treatment time, and need for referral for the following conditions:
A. accommodative dysfunction
1. insufficiency
2. excess/spasm
3. infacility
4. fatigue
5. paralysis/paresis
B. oculomotor dysfunction
1. position maintenance
2. deficiency, saccadic eye movements
3. deficiency, pursuit eye movements
4. nystagmus
C. non-strabismic binocular vision disorders
1. convergence insufficiency
2. convergence excess
3. divergence insufficiency
4. divergence excess
5. basic exophoria
6. basic esophoria
7. hyperphoria/cyclophoria
8. anisophoria
9. fusional convergence dysfunction
a) amplitude
b) facility
10. fusional divergence dysfunction
a) amplitude
b) facility
11. fixation disparity
12. gross convergence insufficiency
13. suppression/sensory fusion deficiency
14. deficient stereopsis
15. aniseikonia
D. OEP case types
1. embedded B cases
2. minus projection
3. non-malingering syndrome
E. strabismus
1. esotropia
a) congenital
b) accommodative
c) developmental
d) acquired
e) cyclic
f) microtropia
g) basic
h) divergence insufficiency
i) convergence excess
j) intermittent
k) constant
l) comitant
m) non-comitant
2. exotropia
a) congenital
b) developmental
c) acquired
d) microtropia
e) basic
f) divergence excess
g) convergence insufficiency
h) intermittent
i) constant
j) comitant
k) non-comitant
3. cyclovertical
a) hyper/hypo deviations
b) AV syndromes
c) dissociated vertical deviations
d) primary overactions
e) congenital
f) developmental
g) acquired
h) intermittent
i) constant
j) comitant
k) non-comitant
4. syndromes
a) Duane's
b) Brown's
c) strabismus fixus
F. amblyopia
1. stimulus deprivation
2. strabismic
3. refractive
4. anisometropic
5. psychogenic
G. eccentric fixation
H. nystagmus
1. congenital
2. latent
3. blockage syndrome
I. visual perceptual dysfunction
1. visual discrimination
a) laterality
b) directionality
c) form orientation/size
2. visual figure ground
3. visual closure
4. visual memory
a) sequencing
b) visualization
5. visual attention
J. intersensory integration
1. visual motor integration
2. fine motor coordination
3. auditory visual integration

VIII. Demonstrate the ability to select and administer appropriate treatment procedures for each of the categories below. Students should be able to demonstrate knowledge of instructional set, ability to overcome difficulties they may encounter when trying to teach these procedures, and knowledge of appropriate sequencing of these activities.
A. oculomotor/binocular vision
1. pursuits and fixations
2. saccades
3. accommodation
4. fusional vergence
5. sensory fusion/stereopsis
6. anti-suppression
7. binocular correspondence
8. amblyopia
9. eccentric fixation

B. visual perceptual-motor
   1. visual perception
      a) visual discrimination
         (1) laterality
         (2) directionality
         (3) form orientation/size
   2. visual figure ground
   3. visual closure
   4. visual memory
      a) sequencing
      b) visualization
   5. visual attention
   6. intersensory integration
      a) visual-motor integration
         (1) fine and gross motor coordination
      b) auditory visual integration

IX. Describe how learning theory applies to alteration of visual performance, to include:
A. behaviorism
B. classical conditioning
C. operant conditioning
D. feedback
E. biofeedback
F. motivation
G. reinforcement
H. performance assessment

X. Implement the proposed vision therapy plan, evaluate the effectiveness of therapy through follow up evaluations of both subjective and objective findings, and make appropriate changes when required.

XI. Describe a management plan to be utilized after vision therapy is complete.

XII. Describe the roles and services of other professions working with patients having oculomotor, binocular and visual perceptual dysfunctions in a cooperative interdisciplinary diagnosis and management program, to include:
A. neurology
B. physical and rehabilitation medicine
C. neuropsychology
D. physical therapy
E. occupational therapy
F. psychiatry
G. clinical psychology
H. school psychology
I. educational psychology
J. general and special education
K. speech and language pathology
L. audiology
M. rehabilitation counselors
N. social workers
O. school nursing
P. pediatrics
Q. ophthalmology

XIII. Communicate verbally or in writing with other professionals in order to consult or refer when appropriate, to include:
A. brief history
B. diagnostic summary
C. assessment
D. management plan
E. request for consultation or referral
F. follow up recommendations

Goal #10

Knowledge of the role of environment and its modification, in providing optimum performance for oculomotor, binocular, and vision perception functioning.

The student will be able to:

I. Describe the role of lighting and contrast as they influence visual information processing in reading and non-reading tasks, to include:
A. VDTs
B. lighting
C. glare
D. contrast
E. spatial effects
F. temporal effects

II. Explain the interactive effects, both positive and negative, of visual, auditory, and tactual-proprioceptive factors on visual performance, to include:
A. attention
B. distractibility
C. postural effects
D. sensory "noise" levels
E. seating and work area effects
F. static vs. dynamic visual tasks

III. Describe the effects of variations in visual stimuli on visual task performance in reading and non-reading tasks, to include:
A. size
B. shape
C. typography
D. spacing
E. contrast

IV. Assess lighting and environmental characteristics of the work area, to include:
A. lighting
B. glare
C. contrast
D. spatial effects
E. temporal effects
F. stimulus size
G. stimulus shape
H. typography
I. spacing

V. Recommend applicable changes in lighting and the environment to enhance and improve efficiency in visual tasks.

Goal #11

Knowledge of the educational, vocational, legal, social, financial services available from community, state, regional and federal agencies for the management of oculomotor, binocular, and visual perception dysfunctions.

The student will be able to:

I. Describe the federal and state legislation affecting patients with oculomotor, binocular vision and visual perceptual disorders, to include programs such as:
A. PL 94-142 Education of Handicapped Children Act
B. Head Start
C. Medicaid
D. Crippled Children's services
E. Maternal and Child Health services
F. Early Periodic Screening, Diagnosis and Treatment

II. Describe the concept of mainstreaming and least restrictive environment.

III. Explain the significant differences between special education alternative placement models:
A. regular class
B. special instruction with regular classroom placement
C. resource room
D. self-contained special classroom
E. private and public day schools
F. private and public residential schools
G. itinerant teacher programs
H. sheltered workshops
I. institutionalized care

IV. Describe the general process of obtaining and maintaining appropriate educational programs for children with special needs. Procedures for individual education program (IEP).

V. Describe community advocacy services for patients with oculomotor, binocular vision and visual perceptual dysfunctions, such as:
A. Lion's Club
B. Variety Club
C. ACLD (Association for Children and Adults with Learning Disabilities)
D. CEC (Council for Exceptional Children)

E. State advocacy services (Developmental Disabilities Protection and Advocacy Services)
F. Association for Retarded Citizens
G. National Society for Autistic Children
H. United Cerebal Palsy Association

Goal #12
Understanding the practice administration and economic concepts involved in the delivery of care for patients with oculomotor, binocular, and visual perception dysfunctions.

The student will be able to:

I. Analyze a community, in order to assess the potential for providing services in the area of oculomotor, binocular and visual perception dysfunctions, by listing the following:
   A. population
   B. number of vision care practitioners (O.D.s and M.D.s)
   C. number of vision care practitioners providing vision therapy services
   D. number and location of elementary, junior and high schools
   E. number of children at each location
   F. special resources available in the community for adults and children with special needs
   G. economic characteristics of the population, to include:
      1. major industries and occupations
      2. employment rate
      3. educational level

II. List the instrumentation, supply needs and their costs for setting up a practice to provide oculomotor, binocular and visual perception services, to include:
   A. diagnostic equipment
   B. office and home therapy equipment
   C. patient information materials
   D. office and home therapy instructional materials

III. Draw a physical office plan which incorporates space to provide oculomotor, binocular and visual perception services.

IV. Develop an economic plan for an office to provide oculomotor, binocular and visual perception services, to include:
   A. written description of an accounting system
   B. calculated chair costs
   C. calculated oculomotor, binocular and visual perception dysfunction service fees

V. Manage vision therapy in a cost effective manner by supervising more than one appropriately selected vision therapy patient simultaneously.

VI. Develop an office record keeping system, to include:
   A. designing patient record forms for oculomotor, binocular and visual perception services
   B. designing a recall system based on patient problem, frequency of recall and follow-up success
   C. written description of an insurance system

VII. Develop an office personnel plan, to include:
   A. determining office personnel needs based on oculomotor, binocular and visual perception dysfunction patient load characteristics
   B. writing a job description for office personnel (receptionists and therapists)

VIII. Develop an external marketing plan, to include:
   A. identifying sources for the listing of oculomotor, binocular and visual perception services, such as the phone books, directories of special services for the learning handicapped, etc.
   B. preparing an introductory letter to school officials and educators describing oculomotor, binocular and visual perception services provided
   C. writing a sample newsletter
   D. writing an outline for presentation of oculomotor, binocular and visual perception issues (such as relationship of vision to learning) to parent groups, teachers and other health care professionals
   E. selection and/or development of OBVP pamphlets to be used in mailings or presentation handouts

Goal #13
Knowledge and skill needed for the development of appropriate interpersonal relationships in the care of oculomotor, binocular, and visual perception dysfunction.

The student will be able to:

I. List and describe the factors which may affect interpersonal relationships and communication, including:
   A. effective listening
   B. acknowledgement of patient's remarks with non-visual cues
   C. clarification of ambiguities
   D. awareness of non-verbal cues
   E. effective speech (clear articulation)
   F. observation of patient's responses
   G. avoidance of ambiguity
   H. projection of positive attitude
   I. avoidance of emotionally negative stimuli
   J. appropriate vocabulary

II. Conduct a clinical interview and demonstrate the ability to:
   A. respond constructively and rationally to the patient (i.e. demonstrated by instructor evaluation of video tape replay of interview)
   B. establish a positive relationship with the patient (i.e. demonstrated by patient responses on a questionnaire)

III. Demonstrate the ability to develop interpersonal relationship/communication with other professionals by:
   A. writing reports and requests
   B. request for information

IV. Demonstrate the ability to explain the basic anatomy, physiology and neuropathology of oculomotor, binocular and visual perception dysfunctions, as they relate to concerns of patients in both technical and lay terms.

V. Supervise ancillary personnel in the delivery of vision therapy services.

Goal #14
Ability to critically evaluate and contribute to the literature of ocular motility, binocular vision, and vision perception.

The student will be able to:

I. Analyze and criticize scientific articles on ocular motility, binocular vision and vision perception, with attention to the following:
   A. logical principles
      1. argument vs. exposition
      2. induction
      3. deduction
      4. principles of inference
   B. forming hypotheses
   C. testing hypotheses
   D. evaluating evidence
      1. selection bias
      2. observer bias
      3. subject bias
   E. decision making
   F. statistical reasoning
      1. calculating probabilities
      2. statistical concepts
      3. hazards in interpreting statistics
   G. causal principles
   H. definition
   I. classification
   J. fallacy and fallacious argument

II. Write a report suitable for publication for the professional literature, to include one or more of the following:
   A. case report
   B. review article
   C. experimental reports

III. List the sources of current information about oculomotor, binocular and visual perception dysfunctions, including both optometric and non-optometric journals. □

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