

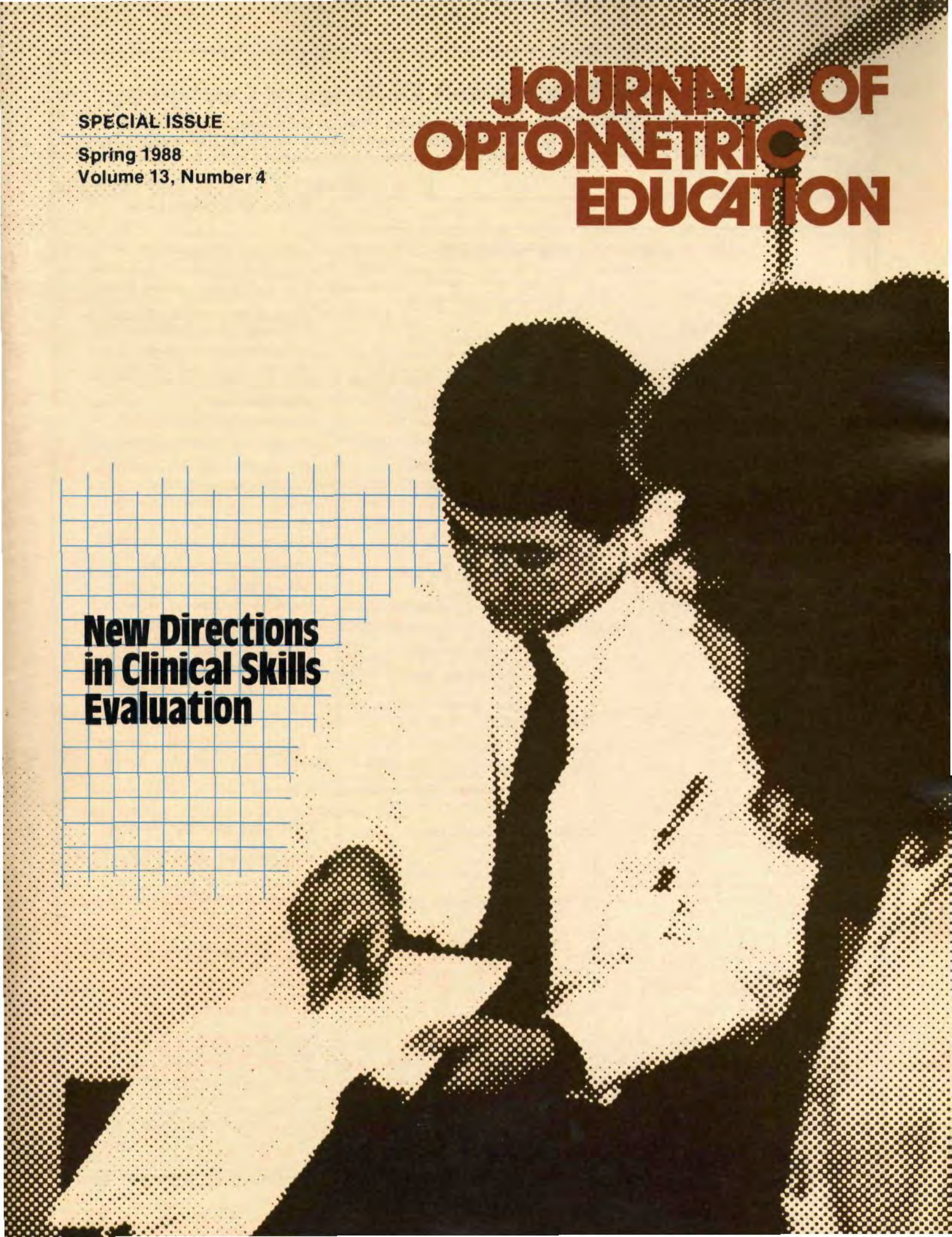
SPECIAL ISSUE

Spring 1988

Volume 13, Number 4

JOURNAL OF OPTOMETRIC EDUCATION

**New Directions
in Clinical Skills
Evaluation**



Association of Schools and Colleges of Optometry

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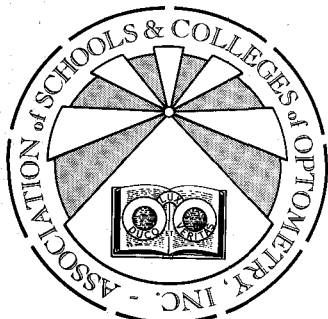
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Clinical Skills Evaluation: The Role of Behavioral Objectives

This special issue of the *Journal of Optometric Education* contains the collected papers of a symposium on clinical skills evaluation that was presented at the Education Section of the 1987 Academy of Optometry Meeting. A major theme throughout the symposium concerned the role of behavioral objectives in competency assessment. This is an appropriate emphasis since direct observation of clinical performance is the best way to determine competence in the psychomotor and affective domains of learning. Behavioral objectives are also a foundation of curriculum design and can help us to more effectively analyze what students should be doing at any given point in their program.

The importance of behavioral assessment has also been stressed by the agencies that judge competence to practice at graduation. Witness the recent publication of "A Manual for the Assessment of Entry-Level Clinical Skills" by the International Association of Boards of Examiners in Optometry in association with the National Board of Examiners in Optometry.¹ Clearly, we are at odds with a current trend if we do not embrace this important concept. Therefore, as an introduction to this special issue, I will explore with our readers the development and use of behavioral objectives in evaluation and curriculum design.

Clinical skills evaluation is one of the most important, yet often most frustrating activities in which faculty members participate. Unlike didactic learning, which can be conveniently assessed by written exam, clinical competency is usually judged by direct observation. Done properly, this process requires a significant expenditure of faculty time and effort.

Unfortunately, even when sufficient faculty resources are available, objectively valid clinical assessments can be very difficult to make. For example, without guidelines, individual faculty interpretation of what constitutes a correct performance can vary a great deal. Setting standards for acceptable clinical performance is an obvious solution to this problem. However, the development and day-to-day implementation of such standards requires a strong commitment by both faculty and administration alike.

Working from the ultimate goals of desired graduate clinical ability, a faculty determined to set standards must devise a series of related behavioral objectives that define clinical competency. These objectives should describe correct technical, management and interpersonal behaviors in a manner which is easily understood by faculty and student alike. They also should be designed for utilization throughout the curriculum at several levels of instruction and formative evaluation.

Since arbitrary structure can be as frustrating as no structure at all, these objectives should be developed by the faculty working as a team. Furthermore, ample time should be available for faculty training workshops to ensure uniformity of understanding and application of the methods of instruction and evaluation that are devised.

Faculties undertaking this task should take comfort from the fact that we are all, at each school, simultaneously involved in a similar process. Sharing ideas, both informally and through organized inter-institutional symposia, can help to avoid too much duplication of effort as well as unnecessary mistakes. Our national organizations could aid this process by organizing and sponsoring such meetings. Certainly, the recently held ASCO/NBEO workshop on clinical assessment was helpful in profitably bringing together key faculty at each institution who were involved in this process.

The rewards of such a program are significant and well worth the effort. While it is a major task to produce, the detailed specification of expected performance throughout the program makes instruction and evaluation easier and leads the way to better curricular design.

Felix M. Barker, II, O.D., M.S.
Associate Professor
Pennsylvania College of Optometry

1. Scott RL. A Manual for the Assessment of Entry-Level Clinical Skills in Optometry. Washington, D.C.: International Association of Boards of Examiners in Optometry, 1987.

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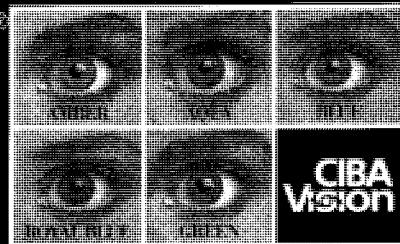
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Berlin Chosen as Site for the Bausch & Lomb Symposium

The International Congress Center in Berlin has been designated as the site of this year's European Symposium On Contact Lenses, to be held October 7 through 10.

"Our 1988 symposium will be the eleventh in an increasingly successful series of such symposia," said Ronald L. Zarrella, president of Bausch & Lomb's International Division. "Over 750 eye care clinicians are expected to attend the three-day meeting, collectively representing more than 30 countries around the world," Zarrella adds.

During the symposium, prominent practitioners from Europe, North America and Australia will discuss and analyze the latest developments in the field, providing valuable new insights on a broad range of topics. Featured on the agenda will be a special session dedicated to lens-care solutions, with particular emphasis on patient compliance. Other sessions will include a comprehensive soft lens report and a detailed overview of the past year's progress in RGP lens science. As at previous symposia in the series, attendees will gain a working knowledge of the latest and most innovative research findings, many of them presented as a part of a state-of-the-art technology review centering on new products and new perspectives in vision care.

"Throughout the eleven-year series of symposia, Bausch & Lomb has been actively involved in the educational process, facilitating the flow of professional information," says Dr. David H. Wintermeyer, director of professional services for the company's International Division. "For that reason, the Berlin symposium will include another of our popular poster sessions in the program. As in the past, the posters will illustrate various aspects of contact lens-related studies and research, developed and presented by practitioners and clinicians from all over the world," Wintermeyer adds. □

Logo Paris Establishes Retail Sales Training Program

Logo Paris has named Diana Downs as sales training manager responsible for the development, implementation and overall design of its newly created

Retail Sales Training Program. Downs' 10 years experience has included sales, management and training positions in many segments of the optical industry.

"With the rapid growth of our industry, good, qualified people are hard to find, especially those who are both technical and sales oriented," Downs said. "We have anticipated this with the development of our training department. Our program emphasizes the importance of both product knowledge and selling skills."

To launch the program, three regional "Train the Trainer" sessions were conducted in Chicago, New Orleans and San Francisco. Thirty-two Logo Paris sales managers and sales consultants completed the two day training course. Additional training sessions will be conducted throughout 1988 until all Logo Paris sales consultants are certified to conduct the seminar.

The Logo Paris Retail Sales Training Program has been approved by the American Board of Opticianry and is available on a select basis to Logo Paris accounts. □

FDA Approves Paragon Contact Lens

A new rigid gas permeable (RGP) contact lens that offers significantly higher oxygen transmissibility and resistance to protein deposits has received marketing clearance for daily wear from the U.S. Food and Drug Administration (FDA). The new contact lens, called FluoroPerm®, is among the first of a new generation of lenses containing fluorine, a substance used to improve surface characteristics.

"The fluorine content enhances the lens' ability to resist deposits," said Donald J. Ratkowski, president of Paragon Optical Inc. (Mesa, Ariz.), developer of the lens. "This feature, combined with the highest oxygen transmissibility of any contact lens on the market, makes FluoroPerm lenses ideal for patients who require more oxygen to ensure corneal health."

Dr. Edward Bennett, from the School of Optometry at the University of Missouri, St. Louis, added that even soft lens patients will find that FluoroPerm contact lenses rival the comfort of soft lenses over time.

"FluoroPerm is the ideal lens for new fits and former soft lens wearers. New

patients will experience rapid adaptability, while soft lens wearers will enjoy improved vision, easier handling and better long-term comfort," Dr. Bennett said.

The new lens uses a combination of fluorine and other co-polymers. Fluorine, a substance used in Teflon, enhances the lens' ability to resist protein deposits. This fact means the lens remains cleaner, even for patients with extraordinarily high protein content in their tears. □

CIBA Vision Presents "Toric Lens Video Fitting Clinic"

To help eye care practitioners take advantage of the growing potential for specialty lens fitting, CIBA Vision Corporation announces the availability of an educational video clinic on fitting soft toric contact lenses.

The fifteen-minute video features discussion of soft toric lens designs, fitting techniques, and practice management tips for specialty lenses. The video clinic also covers all aspects of toric lens fitting, including lens orientation on the eye, lens/lid interaction, and lens rotation. Tips on identifying a good soft toric candidate are also featured.

Discussion is aided by innovative computer animation, as well as live clinical footage, that demonstrate the basics of soft toric lens fitting. Featured in the video clinic is CIBA Vision's TORISOFT® (teflon)—the only soft toric lens available with complete "dynamic stabilization"—an effect brought about by the creation of two unique, patented, double thin-zones that orient the lens properly on the eye.

"There is tremendous growth potential in the soft toric contact lens market segment," stated B. J. Shannon, O.D., executive director of professional services for CIBA Vision, "and specialty lens fitting is an important way of enhancing the professional image of a practice."

"As an educational tool," continues Dr. Shannon, "the TORISOFT Fitting Video is recommended for both the 'novice' contact lens fitter as well as the experienced fitter. With education and experience, fitting soft torics can be as easy as fitting spherical lenses."

For further information on CIBA Vision's Toric Lens Video Fitting Clinic, contact Customer Service at 1-800-241-5999. □

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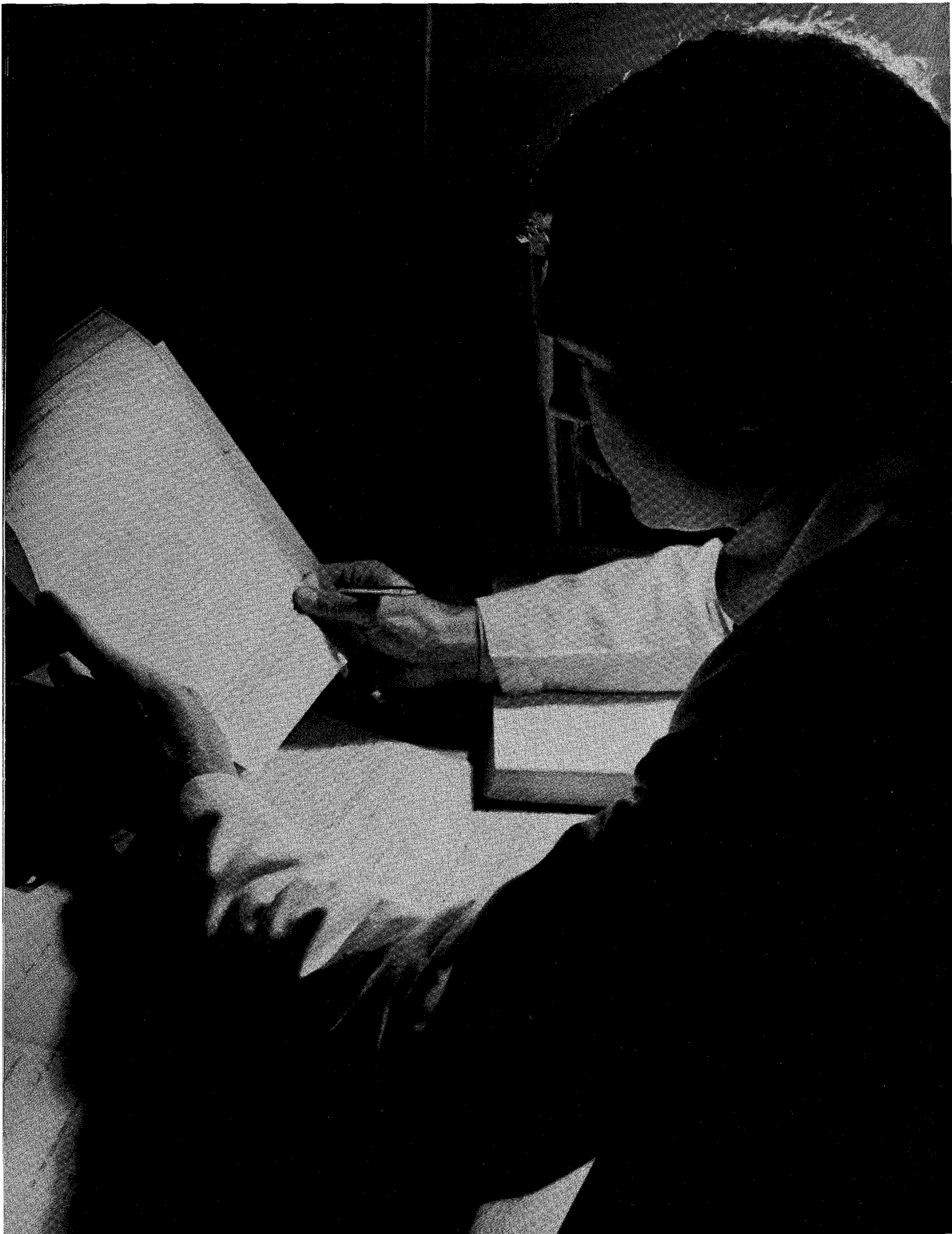
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Clinical Evaluation: Issues and Problems

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

Introduction

Evaluation of student clinical performance is one of the most complex and challenging responsibilities that faculty undertake in optometric education. The application of visual and biomedical science learned in the classroom occurs in the clinical setting. Fundamental clinical skills are also developed. The process of student evaluation, assessment, and feedback is a difficult task. Those students who are not meeting expectations must be identified. Steps must be taken to remediate them. If these efforts are not successful, some students must be dismissed. For those students making satisfactory progress, further direction, motivation, and appropriate rewards must be provided. Information for all these purposes comes from a variety of sources and sites and must be evaluated, aggregated and used to make ultimate judgments.

Use and Goals of the Evaluation Process

When evaluation is discussed, both the content of the evaluation, the knowledge, skills and attitudes, and the methods, the instruments of assessment, are most frequently considered. Those are certainly important components. However, the evaluation process is essentially a systems task.¹ It goes beyond the narrow task of evaluating how successfully students have attained clinical competence. The information

gathered from the evaluation process is necessary to:^{2,3}

- provide feedback to the learner
- improve the instructional process
- provide feedback for internal and external programs
- certify competence
- maintain the quality of care

For students, academic and clinical programs, and the institution, the goals of the evaluation process can be summarized as follows:

"The process of student evaluation, assessment, and feedback is a difficult task. Those students who are not meeting expectations must be identified."

students: provide feedback to students on their progress toward meeting specific clinical objectives in order to maximize learning

academic programs: information on student performance is necessary to

- facilitate student learning
- assign grades
- plan and revise curriculum
- improve instruction (both didactic and clinical)
- adjust admission requirements
- meet accreditation requirements

clinical programs:

- make appropriate faculty assignments
- place students in appropriate settings with specific responsibilities
- plan staff development programs

institutional:

- certify the quality of care
- make long-range plans
- account for the use of resources
- make funding decisions

A Systems Task

As a complex endeavor, the development of a clinical evaluation system requires careful thought and planning. Tasks to be accomplished, personnel, budgetary resources and time needed must be identified. The long-term goal of an effective clinical evaluation system will not be achieved if the short-term goals and activities are not carefully planned. A management plan for development and implementation is thus crucial.^{1,4,5}

In order to plan an effective evaluation system, there should be a clear understanding of the rationale, goals and objectives of the system. While the rationale and goals reflect broad statements of intent that describe what is to be accomplished over a long period, e.g., evaluate clinical program effectiveness, the objectives should be specific, measurable statements of intent.⁴

Example:

Goal: evaluate student clinical performance

Objective: development of evaluation instrument to assess stu-

Dr. Dell is chairman of the Department of Clinical Sciences and associate professor at the Pennsylvania College of Optometry.

dent achievement in relation to clinical objectives

Activities: write objectives for all clinical courses, define performance standards for tasks and traits specified in the objectives, select an evaluation method and type(s) of instrument(s), develop an instrument, field test and revise the instrument (as necessary)

The underlying tenet of the systems approach is that evaluation is not merely, or even primarily, a psychometric task.¹ Rather, it is a task that involves several interactive elements—evaluations, students, content, methods and environment. Whereas methods of evaluation have long been the subject of intense interest and investigation, it is other components, often overstated, that are the key to an efficient and effective evaluation system.^{1,6}

In their multiple and often conflicting roles as teachers, advocates and judges, the evaluators must be trained, motivated, informed and rewarded.^{4,5} Similarly, the students, who in every institution range from outstanding to marginal to disastrous, must be categorized, informed, advised, followed-up, commended, sometimes reevaluated, and sometimes dismissed.¹

Evaluation as a system also must be viewed within the context of the individual institutional environment and for that reason there is no such thing as one optimal system that can be used in all schools.^{1,6} What works in a small institution will not work as effectively in a large one. What works in schools with a poorly functioning evaluation system can be the result of policy problems (for example, a course, department, or service in which almost all students receive honors regardless of performance or an institutional commitment to minority admissions with no subsequent support for minority students who enter); struc-

ture problems (inadequate monitoring of off-campus educational sites); personnel problems (lack of competent faculty); or information flow problems (lack of clear guidelines regarding how problem students will be handled).

"In their multiple and often conflicting roles as teachers, advocates and judges, the evaluators must be trained, motivated, informed and rewarded."

Faculty Role in Evaluation

Faculty often place too much emphasis on the instruments and methods of evaluation.^{7,8,9} We, as faculty, should not become preoccupied with how to evaluate, through forms or behavioral checklists, etc. Certainly the development of reliable and valid instruments of evaluation should be strongly encouraged. However, if faculty are to successfully fulfill their appropriate role in the evaluation process, they must first acknowledge that the primary responsibility for obtaining meaningful evaluations rests with them and that psychometric solutions are not substitutes for, but rather supplements to, their judgments.⁷

Secondly, they must see evaluation as being part of the systems approach to the task. Before knowing "how" to

evaluate, faculty should consider who, why, where and what they are evaluating.⁸ They should be properly trained to understand their roles. They should be trained particularly to surmount their own reluctance to write negative evaluations and to face the individual with that evaluation.⁵ Faculty can make the evaluation process more reliable and objective but should acknowledge that the courts have consistently upheld faculty "subjective" judgments.^{10,11,12,13}

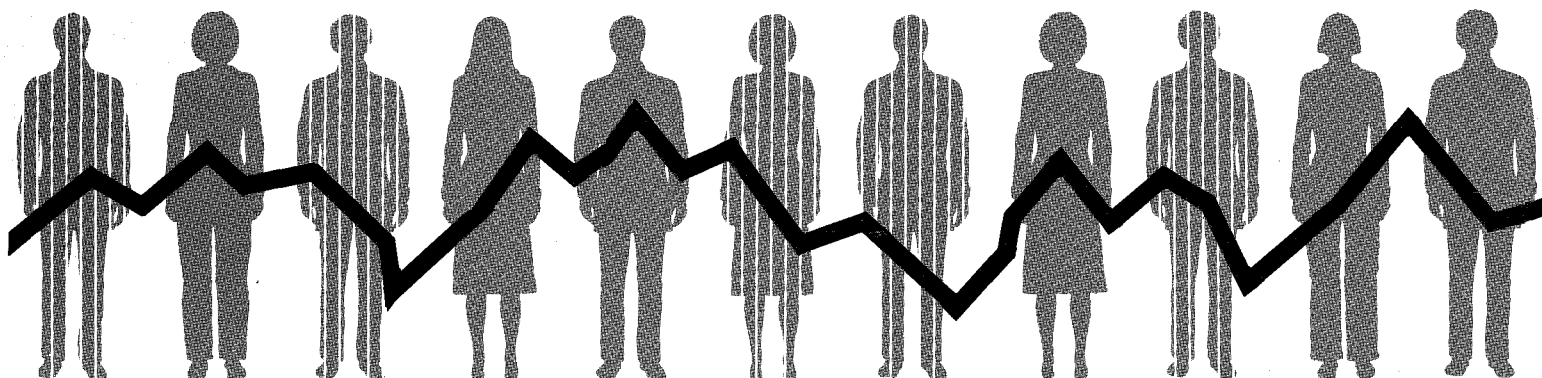
The ability to accurately observe students' clinical performance requires training.^{5,9,14,15} Consistency among and between evaluators is hard to achieve. Defining, accepting and agreeing on evaluator ratings are necessary goals.

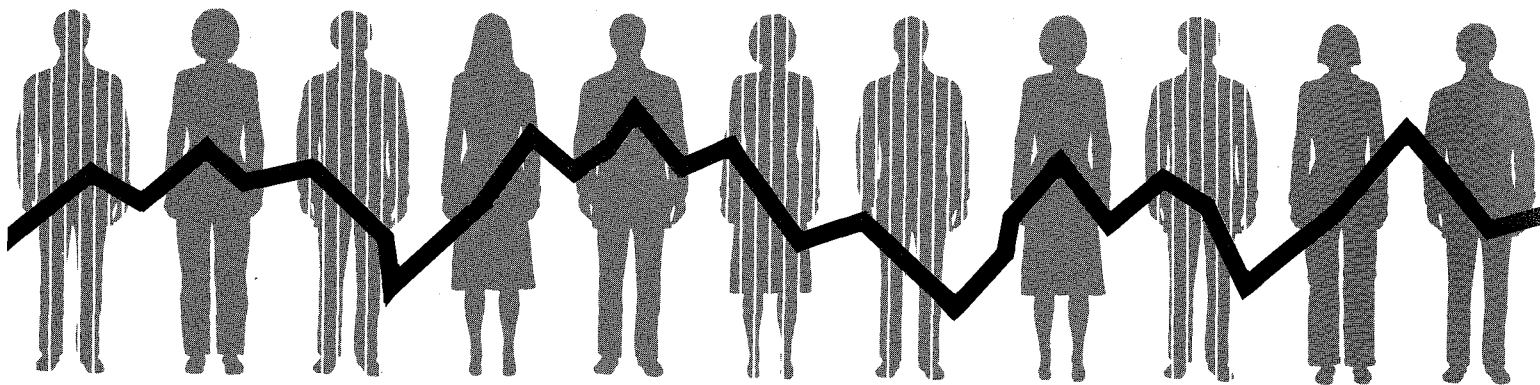
ASCO should be encouraged to further develop training programs for faculty, department chairmen, and other administrators. These programs should be aimed at the modification of the knowledge, behavior, and attitudes of key people in the evaluation system.^{5,9} Initial efforts should be directed at the training of individuals who could in turn become the trainers at their individual institutions. It would be helpful to develop a manual for faculty evaluations which would include the methods of evaluation, the course objectives and the specific performance expected of students. Faculty should also receive regular reports on how their teaching efforts are perceived by students.

Clinical faculty members should be aware of the types of problem students they will encounter and the level of difficulty they will have in diagnosing and managing these students.⁴ With this information, the faculty member can identify and acquire resources necessary for remediation.

Students

The effective and efficient evaluation of students requires the evaluation process to be tailored to different categories of students. As a valid first step in the evaluation process, faculty must have





confidence in their subjective categorization of students.⁵ Through their substantial interactions with students, faculty have accumulated an experiential data base that cannot be replaced by information gathered through existing standardized evaluation instruments.

Studies in medical education indicate that, collectively, faculty readily classify students into three major categories: "superior," "adequate," and "failing."⁸ The students at the extremes are identified easily in most cases. However, they are managed in a considerably different manner.^{6,8} In dealing with the "superior" student, the task is essentially reinforcing and rewarding documented examples of performance. Failing and weaker students are reliably identified but poorly managed by faculty. The task is to document the student's weakness, to make explicit the criteria for acceptable performance, and to specify the criteria by which judgments will be made. If there is failure to improve, the faculty and administration must agree on dismissal, must provide the opportunity for equitable appeal and must not retreat in the face of potential legal action.

In the category of "adequate" performance, there are three major subgroups. First, there are those students who are "adequate" because they are indeed average. Secondly, there are those who are rated "adequate" because not enough information is available to rate them any other way. The third subgroup are those students who are perhaps marginal, but given faculty inclinations, are given the benefit of the doubt and labeled "adequate."

Feedback and Assessment

The evaluation process involves providing feedback to students and assessment.

The development of competency requires periodic evaluations with feedback to the students as an essential element of the evaluative task.^{9,16,17} Form-

ative evaluations serve to identify student strengths and weaknesses.¹⁸ The feedback process must not be confused with the assessment process. Feedback is the process of sharing observations in a constructive and supportive way. Systematic and targeted feedback is one of the most powerful teaching tools available and is generally underutilized.¹⁹⁻²² It is most helpful when it described specific observable behavior, incorporates the giver's feelings, is responsive to the receiver, is checked to ensure clear communication, and is shared soon after the event.⁹ It should be factual, specific, constructive, and extensive. Feedback should be provided immediately in the clinic and at specified intervals during the semester or quarter, the latter as an early warning system for students.¹⁶

For students who are having difficulty, specific action plans to remedy the problems should be developed specifying future learning experiences, necessary resources, and a guide for further assessment. Faculty also must know students well enough to identify and indicate their specific strengths and weaknesses in order to maximize learning.^{1,5}

The assessment of competency requires the application of specific standards of evaluation for acceptable performance including (a) the explicit definition of educational objectives; (b) the specification of criteria for determining when the objectives are met; and (c) methods of assessment of individual performance in relation to criteria.^{3,4,9,18,23}

It is important to define precisely what students should know and should be able to do and to determine whether or not a student has measured up to those criteria. Most schools rely on the traditional methods of goal setting where the educational objectives are less clearly defined.^{4,7} In defining criteria and standards, there remains tremendous difficulty in precisely defining what constitutes a "good" optometrist. The future may bring new information or methods to help us in this task.

The Setting

The clinical setting has considerable influence on the task of evaluating students.⁸ The primary clinical space, numbers and types of patients present, and equipment and faculty availability, have an impact on the selection of appropriate methods of evaluating student performance. Specialty services or remote educational sites may create intricate and formidable problems for the evaluation process. Because of institutional diversity, no two institutions will have identical optimal evaluation systems.^{7,8}

Evaluation Methods

The method of evaluation depends on the content of the evaluation. How evaluations are conducted is dependent on what characteristics are assessed.

The content of evaluation may be divided into three categories: cumulative, enduring and latent characteristics.⁸ Cumulative characteristics consist of fund of knowledge and technical skills. They are developed and improved by students over the course of their optometric education. Explicit determination of what is to be assessed, setting achievement levels for differing stages of the educational process, and specifying the expected rate of growth and improvement are necessary for cumulative characteristics to develop.^{22,24} Objective evaluation tools are most appropriate for this category. Emergent technology and approaches to evaluation such as the Objective Structured Clinical Examination (OSCE), Patient-Management Problems (PMP's), use of simulated/standardized patients, videotape, and computer technology are most advantageous for this task.^{16,25-30} Given the increased validity and reliability of these methodologies, significant effort should be made to increase their utilization in the evaluation process.

Enduring characteristics such as sensitivity, ethical behavior, and reliability are part of the clinical evaluation, but

they are much more difficult to evaluate and modify in the routine course of the educational process.^{8,17} Quantification of enduring characteristics is difficult. Observation over extended periods, educated guesses, and personal judgment of faculty are currently utilized as the means of evaluation.⁶ Inclusion of ethical and legal aspects in addition to technical and problem-solving skills would be of merit in this area.

Latent or inferred characteristics such as supervisory or independent decision-making ability require faculty to make judgments about behaviors which cannot be observed at the time.^{7,8} Quantification of latent characteristics is even more tenuous than enduring characteristics.¹⁷ Evaluation forms should help make explicit the inferences that the faculty are asked to make.

In selecting categories for evaluation, the variables should correctly identify important rather than trivial dimensions of performance. The variables also should appear relevant to faculty and students (face-validity).³¹

The Longitudinal Perspective

Faculty must view the evaluation process from a cumulative, developmental, and longitudinal perspective.^{5,6} The informational base for judgments and actions should expand concurrently with the student's progress in the program. Information from each course or service should be provided to each department or site where the student is assigned.

Often faculty members fail to understand their obligation to ensure the standards of professionalism expected by the public.⁵ In failing to recognize this important obligation, each faculty member views the student's performance only as it relates to a single course and from that microcosmic view, feels no obligation to make the tough judgments required to assess a student's overall career development.

The University of Pennsylvania Medical School catalog includes the following statement "... passing grades in individual courses do not guarantee that the student's performance, viewed as a whole, will meet requirements for awarding the degree. For example, a pattern of marginal passes or persistent inadequacies in any area of evaluation will not be considered satisfactory."³² The statement is reflective of that faculty's belief in the longitudinal viewpoint.⁵ Implementation of such criteria should be strongly considered although implementation may indeed be problematic.

Summary

The evaluation of students in clinical settings is a complex management task. It involves an institution wide system of assimilating objective and subjective sources of data, diverse training sites, diverse categories of student learners, diverse content, and diverse evaluators (faculty). It includes defining the rationales, goals, objectives, activities, and resources for both the development and implementation of the evaluation process.

The operationalized clinical evaluation program should be monitored and periodically revised. The feedback system operates not only for the student in the clinical setting but also for the faculty, the curriculum and the patient care program. Review mechanisms for assessing how well revisions in the educational and evaluation programs are working should be developed.

The evaluation criteria and standards of demonstrable validity should be applied consistently and equitably. The formal tools used for evaluation should encompass advanced educational technology and technique, but faculty still should be comfortable in their role as subjective evaluators. Formal training for these purposes must be made available.

The evaluation of student performance must be considered over the whole course of their student careers as many characteristics can only be evaluated on a longitudinal basis. □

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The Problem-Oriented Evaluation Matrix

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Introduction

Comprehensive skills assessment of student performance is a vital part of a clinical program. At the New England College of Optometry, we have developed the "Problem-Oriented Evaluation Matrix" (POEM) to evaluate and provide feedback to students as they engage in patient care. Prior to discussing the specifics of POEM, it is useful to identify the components and characteristics of an optimal evaluative/feedback system.

The Ideal Evaluation System

The overall goal of a clinical skills evaluation system is to provide reliable, valid assessments of student performance for both evaluative and teaching purposes. When creating an ideal in-clinic evaluation system, we need to look at the three primary components: a) the behavioral goals and objectives upon which evaluative judgments are based; b) the instrument (usually a form) used to assess each patient encounter; and c) a system for summarizing a student's clinical performance over time. These three components are inter-related in that each evolves from its

predecessor with the behavioral goals and objectives forming the system's foundation.

Behavioral Goals and Objectives:

The behavioral goals and objectives of a clinical education program should be its driving force and the basis for clinical curriculum development. The goals and objectives statement addresses the expected performance level of the student in several areas, including technical skills, knowledge base, analytical skills and professionalism.

If it is not to be quickly ignored, the document must be concise and in a form which encourages use. In addition, a good goals and objectives document will contribute to the student's educational experience and serve as an educational contract between the student and the preceptor. It also should serve to standardize evaluative criteria and promote interpreceptor reliability. Finally, it should be specific to the student's level of training.

Clinical Encounter Evaluation

Form: The clinical encounter evaluation form is the mechanism by which a student's clinical skills are assessed in relation to the criteria established in the goals and objectives. As an educational tool this form serves two purposes: assessment and feedback. As a method of assessment the encounter evaluation form needs to reflect the goals and objectives for the student's educational level; ideally it should contain criteria identical to the goals and objectives. In order to promote problem oriented thinking by both the student and the preceptor, the evaluation form should be organized to address problem spe-

cific areas. The form needs to be easily applied to allow for timely completion by the preceptor.

By allowing for rapid completion, the encounter evaluation form facilitates its second function of providing timely feedback. Feedback is probably the most effective teaching tool at our disposal. The ideal form needs to provide highly specific feedback to the student if behavioral changes are to be expected.

Clinical Performance Summary:

For grading and promotion purposes it is necessary for a clinical evaluation system to be able to summarize and evaluate clinical performance over time. A summary form should reflect the data of the encounter evaluation forms as closely as possible. The data should be summarized, rather than interpreted or transformed, and the grade based upon preestablished criteria. In fact, anyone viewing the form, adding up the data, and applying the criteria should come to the same conclusion concerning the level of the student's clinical skills relative to the behavioral objectives.

Approximately one year ago, with the above considerations in mind, we decided to create a new evaluation system. The result of this effort is the *Problem Oriented Evaluation Matrix* (POEM).

POEM

The Problem Oriented Evaluation Matrix is a concise, one page statement of the clinical goals and objectives for second and third year students. The same form serves as the student's patient encounter evaluation form. For each period of clinical training, this matrix defines a student's expected level

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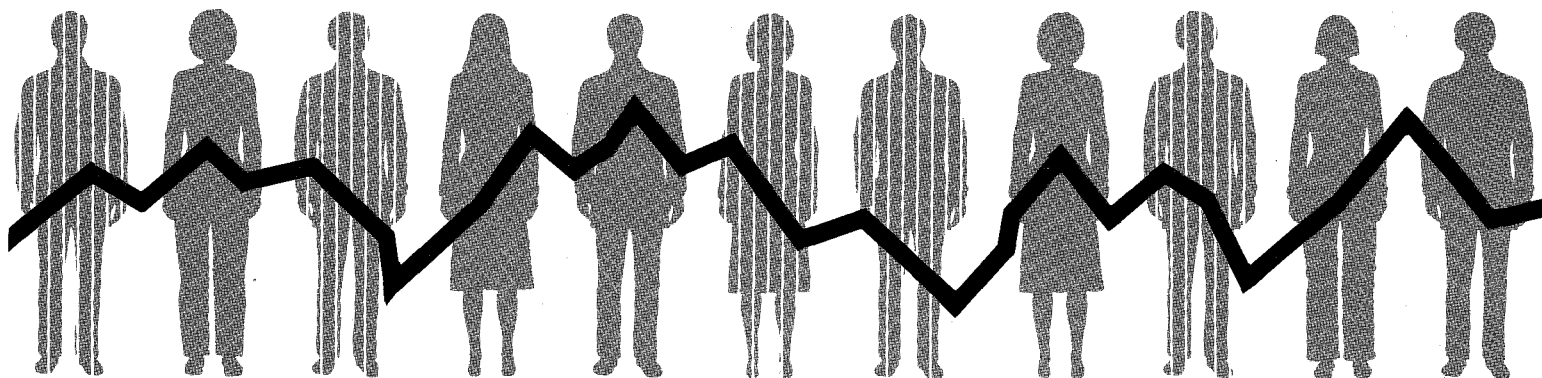
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Table 1

Problem Oriented Evaluation Matrix						
PROBLEM	SECOND YEAR			THIRD YEAR		
	FALL	WINTER	SPRING	FALL	WINTER	SPRING
Myopia	T1K1A1	T2K2A2	T2K2A3	T2K3A3	T3K3A3	T3K3A3
Hyperopia	T1K1A1	T1K1A1	T2K2A2	T2K2A2	T2K2A3	T3K3A3
Astigmatism	T1K1A1	T1K2A2	T2K3A2	T2K3A3	T3K3A3	T3K3A3
Presbyopia	T1K1A1	T1K1A2	T2K2A2	T2K2A2	T2K3A3	T3K3A3
Anisometropia	T1K1A1	T1K1A1	T1K1A1	T2K2A2	T2K3A2	T2K3A2
No Problem	T1K1A1	T2K2A2	T2K3A3	T3K3A3	T3K3A3	T3K3A3
Convergence	T1K1A1	T1K1A1	T2K2A2	T2K2A2	T3K3A2	T3K3A2
Divergence	T1K1	T1K1A1	T2K1A1	T2K2A1	T3K2A2	T3K3A2
Vertical Deviat.	T1K1	T1K1A1	T2K2A1	T2K2A1	T3K2A2	T3K3A2
Accommodation	T1K1A1	T1K1A1	T2K2A2	T2K2A2	T3K3A2	T3K3A2
Strabismus	T1K1A1	T1K1A1	T1K1A1	T1K1A1	T2K2A2	T2K2A2
Amblyopia	K1	T1K1	T1K1A1	T1K2A1	T2K2A1	T2K2A2
Psychosocial			T1K1	T1K1	T1K2A1	T2K2A1
No Problem	T1K1A1	T1K1A1	T2K2A2	T2K3A2	T3K3A3	T3K3A3
Lacrimal	A1K1	T1K1A1	T1K2A1	T2K2A2	T2K2A2	T3K2A2
Red Eye		K1A1	T1K1A2	T2K1A2	T2K2A2	T2K2A2
Glaucoma	T1K1A1	T1K1A1	T1K2A1	T2K2A2	T2K2A2	T3K3A2
Cataracts	T1K1A1	T1K1A1	T2K2A2	T2K2A2	T2K2A2	T3K3A3
Neurological	T1K1A1	T1K1A1	T1K1A1	T1K2A1	T1K2A2	T2K2A2
Pupillary	T1K1A1	T1K1A	T1K1A1	T2K2A1	T2K2A2	T3K2A2
Optic Nerve		T1K1	T1K1A1	T2K1A1	T2K2A1	T2K2A2
Maculopathy		T1	T1K1A1	T2K1A1	T2K1A1	T2K2A2
Periph. Retina				T1K1A1	T1K1A1	T1K1A1
Ret. Vasculature			T1K1A1	T2K1A1	T2K1A1	T2K2A2
Vitreous				T1K1A1	T1K1A1	T1K1A1
Cornea	T1	T1K1A1	T1K1A1	T2K1A1	T2K1A1	T3K2A2
Adnexa	T1	T1K1A1	T1K1A1	T2K1A1	T2K1A1	T2K2A2
Systemic Dis.		T1	T1K1A1	T1K1A1	T2K2A2	T2K2A2
No Problem	T1K1A1	T1K1A1	T2K1A1	T2K2A2	T2K3A3	T3K3A3
Contact Lenses				T1K1A1	T1K2A1	T2K2A2
Pediatric					T1K1	T1K2A1
Geriatric					T1K1	T1K1A1
Vision Therapy				K1	T1K2A1	T1K2A2



of ability to manage specific optometric problems in terms of technical skills, knowledge and analysis. POEM is defined by 33 problem areas, listed in the lefthand column which are viewed in relationship to time as defined by academic quarter across the top. The result is a matrix composed of 198 boxes. Within each box, three letter/number combinations identify the expected performance levels. The letter refers to either techniques (T), knowledge (K) or analysis (A), while the number refers to the performance level. Thus, to understand the goals and objectives for all problem areas within each educational period, it is only necessary to understand the nine descriptors which define three levels of performance for each of the three skills categories (Table 2).

The descriptors listed in each of the matrix boxes were determined with multiple faculty input and took into account the sequence and content of the didactic curriculum. The result is a one page document which defines the clinical goals and objectives for each quarter. It is easily adaptable to other curriculum areas and it can be modified as elements within the curriculum change by simply altering the alpha/numeric of the affected problem areas.

To apply POEM as an evaluation form, it is only necessary to compare the student's performance to the expected level for each problem diagnosed during a given patient encounter. For example, if you were precepting a second year student in the spring quarter and one of the patient's problems was hyperopia, you would locate hyperopia in the lefthand column and move across the matrix to the third column which represents the student's academic level. Here you would find the descriptor T2, K2, and A2. You would then assess the student performance relative to each of these descriptors. If the student had performed at the T2 level, you would

simply circle the alpha/numeric in that column. If the student performed at a level other than might be expected, you move left (indicating "below expected") or right (indicating "above expected") until you find the actual level of performance and circle it. The distance from the expected level is not so important as the fact that the student performed above or below expected. Each diagnosis is individually evaluated in terms of the student's technical skills, knowledge and analytical abilities. When the student reviews the form, the feedback is both detailed and problem specific.

It is important to note that of the 33 problem areas, three indicate "no problem" in the areas of health, functional vision and refractive errors. Deciding that no problem exists also entails a diagnostic process that needs to be evaluated. Thus, each patient encounter is evaluated for a minimum of three areas with at least one each in the general problem areas of health, functional vision and refraction.

In spite of an initial appearance of great complexity, the POEM is simple to use. A circling of the alpha/numeric is required in order to indicate the level of the student's clinical skills. The form can be filled out quickly and presented to the student for immediate feedback and discussion at the time patient care is provided.

Student performance during an academic period is then summarized on the "Quarterly Clinical Skills Summary Matrix." This form reduces the 33 problem areas to three general categories of health, functional vision and refraction with each of these subdivided into techniques, knowledge and analysis. The data from the encounter evaluation forms are tabulated into the appropriate box indicating area of application and level of skill. A grade of Honors, Pass, Remedial or Fail is then given for the evaluation period based on predeter-

mined criteria (e.g. greater than 50% above expected receives a grade of honors). Since the data are summarized without being transformed, interpreter reliability is assured.

Implementation and Evaluation

POEM was implemented in April, 1987, for the Primary Vision Care Service at the Boston Optometric Center. While a number of minor revisions have occurred in the ensuing months, the original effort has been well accepted and quite successful. The faculty has indicated a greater sense of comfort and ease in providing feedback to the students and in determining expected levels of performance. A survey taken of the students prior to and six months after implementation indicates a significant increase in their perceived level of understanding of the clinical goals and objectives and in their own level of skills compared to the previous system. It is important to note that this survey result may be due to an increased faculty conscientiousness as well as to the evaluation system. However, changes in faculty teaching styles also may be directly related to POEM. As noted before, POEM effectively serves as an educational contract.

The primary problem in implementing this type of system was the faculty itself, since the POEM system does require some alteration in teaching style. To effectively assess a student's skills in the areas of knowledge and analysis, the faculty must adopt a style that forces students to demonstrate, both clinically and verbally, their diagnostic thought process and the knowledge upon which it is based. This seems to be most effectively done by beginning conversations about a case with open ended questions and becoming more specific until the questions are at a level at which the student can appropriately respond. Attention also must be paid to the thought

process by which possible diagnoses are ruled out, as well as those that are confirmed. This approach requires a conscious decision by the preceptor to engage in active rather than passive teaching.

Summary and Future

The Problem Oriented Evaluation Matrix has, in general, met the goals we established for the "ideal system." The clinical "Behavioral Goals and Objec-

tives," the Daily Encounter Evaluation Form and the Quarterly Clinical Skills Summary Form are consistent with one another, and each is an outgrowth of the other. The system promotes inter-preceptor reliability and provides feedback at a fairly high level of specificity to our students.

The evaluation of POEM is, admittedly, largely circumstantial and anecdotal with the exception of the student survey. In spite of this, the success is

sufficient that POEM is being adapted for use in the fourth year clinical system and in specialty areas. Currently, there are plans to conduct more indepth studies of the system's validity in relation to other measures of clinical skills. Efforts also will be made to evaluate the feasibility of computerizing the system to simplify the summary process even further and to provide an analysis of the types of cases each student has managed. □

Table 2

P.O.E.M. DESCRIPTORS - CLINICAL GOALS AND OBJECTIVES

TECHNIQUES

T1: The student has learned the basic techniques in lecture and lab. Execution of the procedure requires mental review and preparation by the student. The preceptor frequently needs to observe and/or repeat procedures at this level. This level is the most basic and reflects minimal assimilation.

T2: The student can execute the basic techniques with little forethought and produces accurate results. At this stage, there is little need for the preceptor to repeat the procedure. The student has also begun to link tests into a smooth sequence. When necessary the student can accurately perform problem-specific tests, although some forethought is generally needed.

T3: The highest level of technical ability. The procedures are performed efficiently and accurately. Techniques have become second nature, forethought is not required and the tests are performed efficiently in or out of sequence, reflecting a level of assimilation that allows for flexibility rather than rote performance.

ANALYSIS

A1: In the first stage of clinical analysis, the student is able to identify abnormal test results and link tests so as to identify a problem on a general level. Students at this level are poor at predicting test outcomes, rather they need the test results to begin the analytical process. They tend to rely on retrospective versus prospective analysis.

A2: At the A2 level the student is able to anticipate test results based on previous information and independently perform the differential diagnosis. The student has ability to develop a diagnostic strategy. The student can communicate the diagnosis in a concise fashion in the problem list.

A3: The diagnosis found by the student should approximate the level of diagnosis of the preceptor with minimal assistance. The student should also be able to prescribe an initial course of treatment.

KNOWLEDGE

K1: The student understands a problem or a test at a definitional level. The preceptor's questions must be very specific at this level in order to elicit an correct response from the student. The depth of knowledge at this level allows for clinical application only in the most straightforward of cases.

K2: At this level the student's knowledge has expanded to include an understanding of mechanisms and processes behind a clinical problem or test. The preceptor uses more open ended questions at this level and the student can respond with clarity and a minimum of prompting.

K3: The student has all the knowledge necessary to analyze, diagnose and treat a clinical problem. This level requires a knowledge of facts, an understanding of function and the interrelationship between areas of knowledge. Rather than being led by the preceptor, the student initiates and demonstrates his knowledge.

PROFESSIONALISM

P1: At the P1 level the student has not acted at an appropriate level professionally. This may be poor appearance, a lack of knowledge of clinic protocol, an inability to accept criticism from the preceptor, or a lack of consideration for the preceptor, other students or clinic staff. A student also deserves a rating of P1, if as a result of his handling of the patient, the patient is inattentive to the care provided by the student or is unlikely to comply with treatment.

P2: P2 is the level of professionalism expected of the student. This student appears professional, is familiar with clinic protocol and is generally considerate. The student communicates effectively with the patient and the preceptor.

P3: The P3 student is the exception rather than the rule. This student has excellent communication skills and develops a rapport with the patient that maximizes the patient's compliance with treatment.

Table 3

Quarterly Clinical Skills Summary

F W Sp Su 19__

Student name _____ level: OD-II / OD-III

number of patients seen

		B	E	A		
		Below the expected	Expected	Above the expected	Overall (B, E, or A)	
Refractive	Technique					
	Knowledge					
	Analysis					
Functional	Technique					
	Knowledge					
	Analysis					
Health	Technique					
	Knowledge					
	Analysis					
Special:						
T, K, & A						
Professionalism						
Totals						

Additional comments

Quarter grade: Fail Remedial Pass Honors

Preceptor Signature _____ Date _____

Preceptor Name (print) _____

Pennsylvania College of Optometry to Affiliate with Medical School

Pennsylvania College of Optometry (PCO) and Hahnemann University have signed an agreement establishing an educational affiliation between the two Philadelphia institutions. The agreement, which takes effect July 1, 1988, was announced by Melvin D. Wolfberg, O.D., president, Pennsylvania College of Optometry, and Iqbal F. Paroo, president and chief executive officer, Hahnemann University.

"The public good will be served by the combining of optometric and medical skills in this new health care alliance," said Dr. Wolfberg. "This agreement also demonstrates both institutions' commitment to the strengthening and expansion of education and research in the health care sciences."

"Both institutions stand to benefit from the agreement," said Mr. Paroo. "Each institution will strengthen its curriculum by utilizing the knowledge and expertise of the other's faculty in their respective areas of basic and clinical sciences. At the same time, each will broaden its clinical base and expose students and residents to more rounded clinical experiences."

"The affiliation is exciting not only because of what it brings to the present, but because of its future ramifications," said Harry Wollman, M.D., vice president for Academic Affairs and dean, School of Medicine, Hahnemann University. Joint research programs between the Pennsylvania College of Optometry and Hahnemann University, for example, will be encouraged, according to the agreement, as will the development of new and innovative health care delivery enterprises through both The Eye Institute of the Pennsylvania College of Optometry and Hahnemann University Hospital.

"We also look forward to having the faculties of both institutions interact in joint educational programs, such as continuing education lectures for practitioners, seminars and grand rounds," said Thomas L. Lewis, O.D., Ph.D., dean of Academic Affairs, Pennsylvania College of Optometry.

"As a result of the affiliation, PCO and Hahnemann will bring together an eye care team whose emphasis will be on quality, efficiency and cost-effectiveness," said Hahnemann's Dr. Wollman.

"At the core of the cooperative effort will be participants from professions, disciplines and specialties who share common objectives."

Dr. Hopping Named O.D. of the Year

Richard L. Hopping, O.D., D.O.S., president, Southern California College of Optometry (SCCO), has been named "Optometrist of the Year" by the California Optometric Association (COA). The award, the highest award given by the COA, was presented to Dr. Hopping for his outstanding contributions to the public, the community and the profession.

This is the second time Dr. Hopping has received the "Optometrist of the Year" award from a state association. In 1962, he was honored by the Ohio Optometric Association as its "Optometrist of the Year."

Prior to joining SCCO in 1973, Dr. Hopping was a private practitioner in Dayton, OH, for 21 years, where he was an active participant in numerous professional and community organizations. Over the years he has compiled an extensive list of honors and awards from the profession and from the communities in which he has served.

Dr. Hopping has lectured and written extensively on optometry. He has served

in key leadership roles in numerous state and national optometric organizations including Past President, American Optometric Association; and Past President, Association of Schools and Colleges of Optometry.

Currently, he serves as Chair, National Academy of Practice in Optometry; and Chair, Professional Enhancement Program, American Optometric Association.

The COA's "Optometrist of the Year" award was presented to Dr. Hopping at the COA President's Banquet on Saturday, March 5, at the COA Congress, held March 3-6, in San Diego, CA.

National Board to Give Patient Care Examination

At its February Board of Directors meeting, the National Board of Examiners in Optometry finalized plans to administer its new Patient Care examination for the first time in August 1988. The decision to proceed represents a milestone in optometric credentialing.

Further details about this pilot examination are forthcoming in a special candidate guide. For more immediate information, contact the National Board at 5530 Wisconsin Avenue, NW, Suite 805, Washington, DC 20815, (301) 652-5192.



Dr. Richard L. Hopping, president, Southern California College of Optometry (center), proudly displays the 1988 "Optometrist of the Year" plaque presented to him by the California Optometric Association. Pictured with Dr. Hopping are his wife, Patricia, and the 1987 recipient of the award Dr. L. Edward Elliott. Dr. Elliott presented the award to Dr. Hopping.

Using the Needs Assessment to Evaluate Clinical Performance

Marilyn K. Gilbreath, O.D.
Samuel D. Hanlon, O.D.
David L. Park, O.D.

Introduction

Evaluations have traditionally been used to assess clinical performance and to assign grades. Because of their dual functions, evaluations are generally classified as being one of two types:

- **Formative or process evaluations** take place during a block of time such as a quarter or semester and are used to modify or make corrections in student performance while in progress.
- **Summative or outcome evaluations** determine the achievement of program objectives by students in relationship to their peers or to a set of criteria. The only true summative evaluation for students in optometry schools is at the satisfactory completion of the four year program. However, in all practicality, the clinical training program can be divided into quarters with summative evaluation occurring at the middle and end of each quarter.

Student clinical evaluations are often difficult to administer because of their potential subjective nature. The difficulty is compounded by accepting the premise that evaluation is ranked as the highest level of cognitive thought as

advocated by Bloom's taxonomy. A method of student evaluation that reduces the subjective component and assists the cognitive thought process has been developed using the following:

- Midterm and Final evaluations
comprehensive
- Daily evaluations
daily brief report

"Student clinical evaluations are often difficult to administer because of their potential subjective nature."

Methods

A comprehensive evaluation form for primary care clinical performance was designed using 15 clinical elements. These 15 elements were classified into three categories as follows:

- Examination skills
Case history
Refraction
Binocularity
Health assessment

- Analysis skills
Problem-specific data
Assessment
Problem definition
Treatment plans
- Management skills
Communication
Attending behavior
Addressing needs
Time efficiency
Patient education
Appearance/hygiene
Record keeping

This evaluation can be used for both formative and summative evaluations. Its main emphasis is directed at helping students identify their strengths and weaknesses during clinical performance (formative). It also is used to assign grades (summative).

The behavioral objective of greatest importance for each quarter for third year clinicians at the Southern California College of Optometry is designated by the curriculum. The objectives are as follows:

- Fall quarter—examination skills
- Winter quarter—analysis skills
- Spring quarter—management skills

When faculty members evaluate students, they are asked to pay close attention to the particular knowledge, skill or attitude prioritized by the objective for that quarter.

During the quarter, students are evaluated on a daily basis using Table 2 that lists the 15 clinical elements. The rating given is simply Outstanding, Acceptable or Unacceptable. At midquarter and final time periods, faculty members use the more extensive clinical evaluation

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tool that lists the 15 elements with two to four descriptive items. Each item is rated by a number ranging from 1, meaning "rarely performs this test or unable to do this test or procedure" to 5, meaning "the test/procedure is frequently performed or performed accurately and efficiently." The daily evaluation forms serve as reference in order to more objectively complete the midterm and final comprehensive evaluations.

When the extensive evaluations are received from faculty, numerical ratings are entered in a computer program which mathematically weighs the educational objective of greatest importance for the quarter with more emphasis. A numerical total value is generated from this analysis and is used for the historical assigning of grades at quarter's end. It is also used at midquarter to show relative performance among the class.

The students' strengths and weaknesses can be analyzed with the data from the evaluation forms. This "needs analysis" includes a Student Report showing a summary of the 15 elements. Each quarter the educational objectives are set by the curriculum as high, moderate or low in importance (in winter quarter for example, high importance is placed on analysis skills, moderate im-

TABLE 1

Primary Care Clinical Evaluation

Directions for Parts I and II:

Observe the clinician's performance during at least three patient visits and mark the appropriate box for each item.

1 - Rarely	(0-20% of the time)
2 - Sometimes	(20% - 40%)
3 - Often	(40% - 60%)
4 - Usually	(60% - 80%)
5 - Frequently	(80% - 99%)

I. ANALYSIS SKILLS

File #s

A. Problem-specific data

1. performs sufficient tests to define problems

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. avoids unnecessary testing

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

B. Assessment

3. recognizes spurious findings

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. recognizes significant findings

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

C. Problem definition

5. lists complete set of problems

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. lists problems at highest level of understanding

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

D. Treatment plan

7. formulates a plan for each problem

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. plans are appropriate

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

II. MANAGEMENT SKILLS

File #s

A. Communication

9. communicates at patient's level of understanding

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

10. appropriate verbal and non-verbal response

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

B. Attending

11. maintains direct eye contact

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

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TABLE 1 (Cont.)

12. posture demonstrates attentiveness	1	2	3	4	5
13. avoids nervous, distracting behaviors	1	2	3	4	5
14. maintains personal distance from patient	1	2	3	4	5
C. Addressing needs					
15. demonstrates understanding of chief complaint	1	2	3	4	5
16. identifies additional patient concerns	1	2	3	4	5
17. explores options with the patient	1	2	3	4	5
D. Time efficiency					
18. finishes exam in the allotted time	1	2	3	4	5
19. uses time efficiently	1	2	3	4	5
20. greets patient promptly	1	2	3	4	5
E. Patient education					
21. summarizes and presents results to the patient	1	2	3	4	5
22. promotes and obtains patient compliance	1	2	3	4	5
23. discusses recall and follow-up	1	2	3	4	5
24. discusses out dispensing services	1	2	3	4	5
F. Appearance/hygiene					
25. wears appropriate clinical attire	1	2	3	4	5
26. washes hands before each patient encounter	1	2	3	4	5
27. cleans instruments before seeing patient	1	2	3	4	5
28. maintains a neat and orderly exam room	1	2	3	4	5
G. Record keeping					
29. records legibly	1	2	3	4	5
30. assures that all forms are completed, dated, signed	1	2	3	4	5
31. makes legal correction of errors	1	2	3	4	5
32. charges the correct fees	1	2	3	4	5

Directions for Part III:

After directly observing each of the following skills demonstrated on a patient, mark the box that best describes the performance.

- 1 - Unable to fully complete the procedure
- 2 - Incorrect technique and questionable results
- 3 - Basically sound technique but questionable results
- 4 - Sound technique with sound results
- 5 - Accurate complete results, efficiently performed technique

III. Examination skills

A. Case history		File # _____						
33.	chief complaint accurately/completely defined	1	2	3	4	5		
34.	open-ended PMH, PEH, FMH, FEH questions	1	2	3	4	5		
35.	specific clarifying questions	1	2	3	4	5		
36.	documentation of history	1	2	3	4	5		
B. Refraction		File # _____						
37.	control of accommodation on retinoscopy	1	2	3	4	5		
38.	retinoscopy technique	1	2	3	4	5		
39.	proper equivalent sphere prior to JCC	1	2	3	4	5		
40.	JCC technique	1	2	3	4	5		
41.	refraction endpoint	1	2	3	4	5		
C. Binocularity/Accommodation		File # _____						
42.	lateral and vertical phorias	1	2	3	4	5		
43.	vergences	1	2	3	4	5		
44.	accommodative function	1	2	3	4	5		
D. Health assessment		File # _____						
45.	slit lamp exam	1	2	3	4	5		
46.	angle estimation	1	2	3	4	5		
47.	applanation tonometry	1	2	3	4	5		
48.	fundoscopic exam	1	2	3	4	5		
49.	cup/disk ratio	1	2	3	4	5		
50.	visual fields screening	1	2	3	4	5		
E. Comments								

Faculty Signature

Date

portance on management skills and low importance on technical skills). The importance levels change depending on the quarter of clinical education.

The Student Report lists the scores for each of the 15 elements. The student receives this summary and schedules a conference with the evaluating faculty. Feedback is given on the priorities that were established from the objectives and the performance. The priorities are established by the chief of primary care and director through the use of a nine cell prioritizing grid comparing performance and importance.

Results

In the sample Student Report, the lowest performances are as follows:

- assessment (3.5)
- problem definition (2.5)
- addressing needs (3.3)
- case history (3.8)
- binocularity (3.7)

The elements with the highest importance for the example (winter quarter) are those found under analysis skills which include assessment, treatment plans, problem definition and problem specific data. The priorities become those elements with the lowest performance and the most importance. In this example, assessment and problem definition are the priority elements. Moderate importance and low performance also can be used to determine elements which need improvement. In this case, addressing needs would be categorized in this low performance, moderate importance prioritization. Faculty should give the greatest feedback and help to the student on improvement of those elements identified by the needs assessment.

Discussion

The midquarter evaluation is a formative process and used to discuss priorities and clinical performance. The final evaluation uses the same comprehensive form but is used to generate a summative evaluation which includes the class average. Students may know where they stand in overall performance compared to their peers.

This tool also may identify problems in the clinical program in general when a large percentage of students receive low performance for a particular element. If one or more elements are consistently identified as areas needing improvement for a significant number of students, the training given to the students may need modification.

Other reports generated from data obtained through the comprehensive evaluation include the Faculty Summary, Faculty Summary of Students, and Class Summary. The Faculty Summary report shows the mean maximum, minimum and standard deviation of all faculty who gave evaluations during the quarter in primary care. This can be used to educate faculty members about how they are evaluating students in comparison to other faculty. It may be possible to see if faculty scores are inflated or low.

The Faculty Summary of Students provides the mean, maximum, minimum and standard deviation among those students evaluated by faculty members during the quarter. Faculty may review this report to determine if grading was consistent with observations made of



TABLE 2

**Daily Evaluation
Primary Care**

Date _____

Student _____

Faculty _____

Please rate the student's performance in the following areas as Outstanding, Acceptable, or Unacceptable. If the rating is Unacceptable, an explanation is required.

EXAMINATION SKILLS

Case History (O, A, U)

Refraction (O, A, U)

Binocularity Testing (O, A, U)

Health Assessment (O, A, U)

MANAGEMENT SKILLS

Communication (O, A, U)

Attending Behavior (O, A, U)

Addressing Patient's Needs (O, A, U)

Time Efficiency (O, A, U)

Patient Education (O, A, U)

Appearance (O, A, U)

Record Keeping (O, A, U)

ANALYSIS SKILLS

Problem Specific Data (O, A, U)

Recognizing Significant Findings (O, A, U)

Listing Problems at Highest Level of Understanding (O, A, U)

Appropriate Plans (O, A, U)

Student Signature _____

TABLE 3

**STUDENT REPORT
PRIMARY CARE GRADE SUMMARY**

CLINICIAN OSGOOD

I. OVERALL ANALYSIS SKILLS	42.0 (OUT OF 60)
A. ASSESSMENT	3.5
B. TX PLAN	4.0
C. PROBLEM DEFINITION	2.5
D. PROBLEM SPECIFIC DATA	4.0
II. OVERALL MANAGEMENT SKILLS	21.8 (OUT OF 25)
A. APPEARANCE	4.3
B. ATTENDING	5.0
C. COMMUNICATION	5.0
D. ADDRESSING NEEDS	3.3
E. TIME	4.0
F. RECORDING	4.5
G. PT EDUCATION	4.5
III. OVERALL TECHNICAL SKILLS	12.3 (OUT OF 15)
A. CASE HISTORY	3.6
B. REFRACTION	4.8
C. BINOCULARITY	3.7
D. HEALTH	4.2

TOTAL POINTS 76.1 (OUT OF 100)

CLASS AVERAGE 76.7

TABLE 4

FACULTY SUMMARY

MEAN	MAXIMUM	MEAN	STD.	FACULTY
78.01	79.14	76.69	0.86	AA
71.80	80.57	63.91	6.85	BB
68.60	74.47	61.62	4.31	CC
73.38	84.48	63.39	6.42	DD
72.16	76.15	67.95	2.90	EE
84.54	86.62	81.17	2.91	FF
76.32	91.19	68.33	9.22	GG
77.89	89.66	61.47	10.98	HH
81.30	83.04	79.31	1.27	II
76.40	81.39	74.57	2.18	JJ
77.87	80.60	73.38	2.74	KK
77.58	79.93	74.21	2.10	LL

the student's clinical performance.

The Class Summary generates a list of all students with maximum, minimum and total scores. This form can be used easily to assign grades. The report may be generated in alphabetical order or ranked by scores.

Conclusion

The tools devised in this evaluation process have been helpful in reducing subjectivity in assigning clinical grades. In addition, with elements specifically stated and subsequently prioritized, faculty members have more guidance as to the areas in which students may need the most assistance. Students also may use this prioritization tool to assign their own performance value to determine strengths and weaknesses. □

FIGURE 1
PRIORITY SETTING

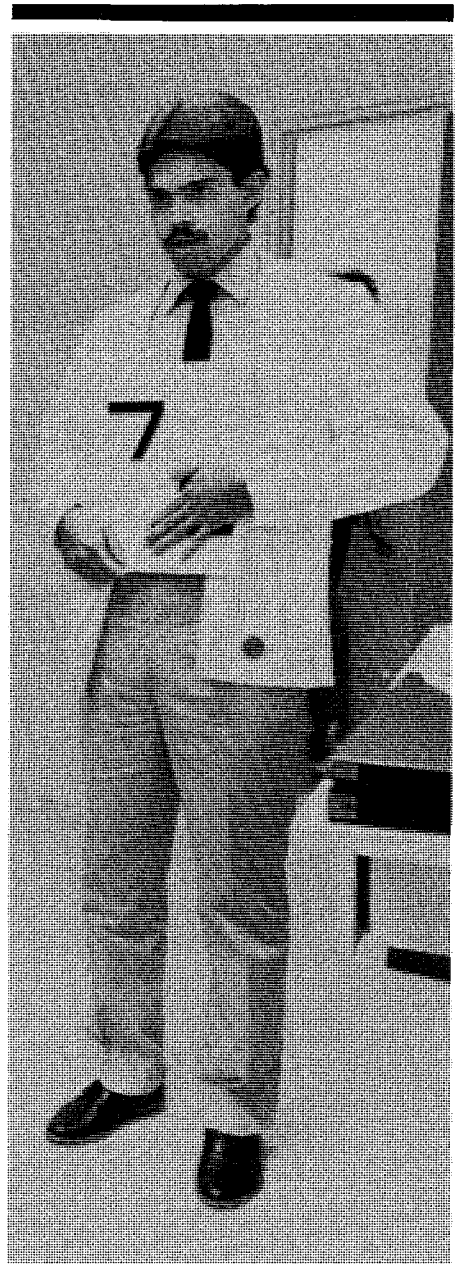
		PERFORMANCE		
		LOW	MODERATE	HIGH
IMPORTANCE	HIGH	ID (Tx Plan)	IA (Problem Specific Data)	
	MODERATE	II C (Addressing Needs) II D (Time Efficiency) II E (Pt. Education)		
	LOW			

WINTER QUARTER OBJECTIVES

HIGH PRIORITY: ANALYSIS SKILLS

MODERATE PRIORITY: MANAGEMENT SKILLS

LOW PRIORITY: EXAM (TECHNICAL SKILLS)



Evaluating Students' Clinical Skills: Identification, Communication and Remediation

J. Randall Vance, O.D., M.S.
Nancy P. Uniacke, O.D.

Introduction

A clinical evaluation should attempt to determine the student's performance level with respect to knowledge of facts, understanding of database relationships, accuracy of the database, communication skills, problem solving skills, and motor skills required in an examination.

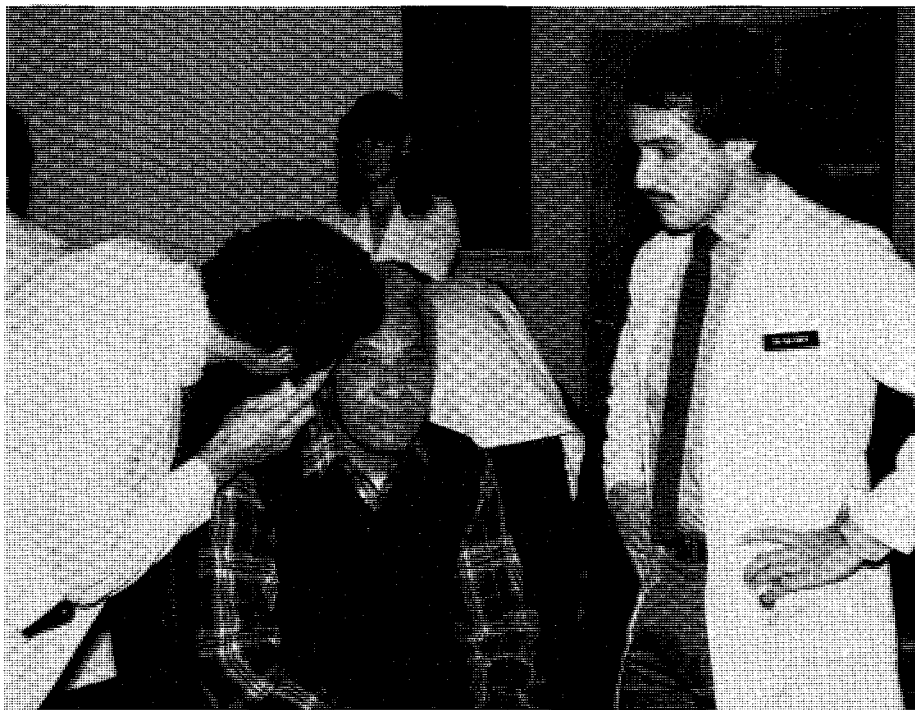
Dr. Vance is director of clinics and assistant professor at the Ferris State University College of Optometry.

Dr. Uniacke is chief, primary care services, and professor at the Ferris State University College of Optometry.

The process of evaluation becomes complicated when factors such as patient personality and instructors' evaluation skills are superimposed. Since many of the skill areas under evaluation produce no tangible, readily measured and verifiable product for evaluation, a high degree of subjectivity is introduced into the process. A successful evaluation process should be characterized by early and accurate identification of those student clinicians whose performance levels and progress fall short of the class norm. The process should communicate faculty concerns to the student in a constructive, non-threatening manner.

Furthermore, it should provide means for remediation of performance concerns in an atmosphere of trust, with success orientation.

An overview of the clinical program design at Ferris State University should facilitate the understanding of our evaluation process. Students enter the clinical program in the Spring quarter of their second year. They are assigned in pairs for one patient encounter per week, serving alternately as the examiner or technician/assistant. A one-to-one student/faculty ratio exists at this early level of training. A summer clinic experience is available between the second and third year at the student's option or upon requirement of the faculty and Director of Clinics. Optometry III students are scheduled for three patient encounters per week for the full academic year. Faculty at this point supervise three students during a three to four hour session. The clinical program for the Optometry IV students covers the entire calendar year with full clinical practice divided into three, fourteen week clinical rotations. Students are required to spend one rotation on campus while electing two other rotations at various affiliated clinical sites within Michigan and in surrounding states. The faculty-to-student ratio generally varies from one-to-two or one-to-four depending on whether primary or secondary care is provided. Since the students are on campus for only one-third of the senior year, clinical skills assessment and management of student progress becomes much more difficult. Early identification is then both practical and desirable in our process.



Evaluation System

In the first two phases of clinical training, daily written evaluations occur, thereby placing the evaluation as close as possible to the time of the clinical performance. The elements of the evaluation are shown in Tables 1 & 2. The evaluations are submitted to the Director of Clinics who reviews them prior to weekly distribution to the students. These evaluations are formative, i.e., an actual grade does not result from this portion of the process. They provide feedback on strengths and weaknesses, allowing the student to act on the recommendations during the next week's experiences. In order to maximize the sampling of opinion during the initial clinical phase, five different faculty members evaluate a given Optometry II student throughout the quarter. Each faculty member makes a judgment based on that particular experience concerning whether summer clinic should be taken "at the student's option," "recommended" or "required." The Director of Clinics reviews the evaluations with any student where a trend toward recommending or requiring summer clinic occurs.

This early identification allows for concentrated assistance and remediation if necessary prior to third year clinic. During the Optometry III phase, the student is assigned to the same faculty member each week for a given time slot. As the daily evaluations are reviewed each week from the three faculty members evaluating the student, proficiencies and deficiencies can be noted and progress charted. A final summative evaluation (Table 3) is submitted at the close of the academic quarter which results in a course grade for Optometry III students. To further ensure that we have not missed identifying a student "at risk," a faculty review meeting is scheduled at the end of Fall and Winter quarters to discuss each student's performance. The meeting serves two purposes: to inform the assigned faculty for the next quarter of both the proficiencies and deficiencies identified for each student they will supervise; and to determine which students, if any, need instruction and remediation beyond that normally provided in the clinical setting. A student needing remediation is referred to the Clinical Proficiency Review Committee.

The committee of three clinical faculty members identifies areas of clinical skills in need of improvement and designs a remedial program to improve those skills. The student is held responsible

TABLE 1

Optometry II Primary Care Evaluation Form

Student _____	Faculty _____
Date of Examination _____	
Patient Profile (age, sex, chief complaint, Dx): _____	
Rate the following	
1 - much below expected level	4 - above expected level
2 - below expected level	5 - much above expected level
3 - at expected level	No Eval - no observation or evaluation
Mechanics of Testing	1 2 3 4 5 No Eval
Accuracy of Data	1 2 3 4 5 No Eval
Examination Structure	1 2 3 4 5 No Eval
Communication Skills	1 2 3 4 5 No Eval
Database Relationships	1 2 3 4 5 No Eval
Comments: _____	
Based on this evaluation, summer clinic experience should be _____	
_____ at student's option	_____ recommended _____ required

Signature _____

TABLE 2

Optometry III Primary Care Evaluation Form

Student _____	Faculty _____
Date of Examination _____	
Patient Profile (age, sex, chief complaint, Dx): _____	
Rate the following	
1 - much below expected level	4 - above expected level
2 - below expected level	5 - much above expected level
3 - at expected level	No Eval - no observation or evaluation
Mechanics of Testing	1 2 3 4 5 No Eval
Accuracy of Data	1 2 3 4 5 No Eval
Examination Structure	1 2 3 4 5 No Eval
Communication Skills	1 2 3 4 5 No Eval
Database Relationships	1 2 3 4 5 No Eval
Comments: _____	
Signature _____	

for completing the required remedial program. It is stressed to the student that this program is not designed as "punishment," but that it is the committee's goal and hopefully the student's, to become a responsible and proficient clinician. Each program is designed individually but often contains elements such as patient examinations in addition to regular clinic assignments, videotaping of examinations for review and critique by the committee, and written reviews and summaries of journal articles or text references. Critical to the remediation process is a one hour weekly meeting that occurs between the student and an assigned committee member. The committee member functions as both faculty and counselor to help students understand their problems and discover strategies to solve them. Progress in the student's remediation program is specifically addressed during this meeting. An attitude change by the student toward more critical self-assessment must be fostered early in the clinical development since it has been found difficult to influence change in the fourth year. The Committee evaluates the student's program performance and makes appropriate recommendations to the Director of Clinics and Dean of the College.

The form pictured in Table 3 is completed at mid-rotation and at the end of the rotation by faculty supervising Optometry IV students. The mid-rotation evaluation is formative with no grade or penalty assessed. A course grade is determined by the Director of Clinics based on the final evaluation(s) submitted by faculty. In the continuing effort to promote more responsibility on the students' part for their own educational development, a self-assessment questionnaire series is given to students at the end of Spring quarter third year.* The students voluntarily complete the forms at the appropriate interval (end of Spring Quarter, end of Rotation 1, end of Rotation 2 and end of Rotation 3) and discuss their perceived strengths, weaknesses and goals with faculty at each site. The practice allows students some flexibility in their clinical pursuits and fosters an attitude of goal setting and continued growth.

*Questions include: (1) what mode of practice do you wish to prepare for? (2) what are your strengths as a clinician at this time? (3) what are your weaknesses as a clinician at this time? (4) in the next rotation, how do you plan to address those areas that need improvement and how can the faculty at the rotation site assist you? and (5) what specific goals have you set for achievement in the next rotation?

Conclusion

From our perspective, the key elements in a clinical skills evaluation system are:

- Feedback: frequent and timely.
- Early identification and remediation of problem areas.

- Low student-to-faculty ratio in clinical settings.
- Communicate with supervising faculty concerning the areas of remediation that are in progress for their students.
- Encourage a transfer of responsibility for clinical proficiency assessment and development to the student. □

TABLE 3

Optometry III/IV Final Evaluation

The following items reflect some of the means by which students can be described. Please circle the number which indicates the degree to which you believe each item is descriptive. Thank you.

	Not descriptive					Very descriptive				
	1	2	3	4	5	1	2	3	4	5
1. Good technical examination skills (Does an efficient examination.) Comment:										
2. Examination data is reliable. Comment:										
3. Understands theory behind examination procedures. Comment:										
4. Performs all appropriate procedures for each patient. Comment:										
5. Develops proper case analysis and patient treatment plan. Comment:										
6. Expresses a feeling of confidence to patients. Comment:										
7. Has good communication skills and rapport with patients. Comment:										
8. Is open to suggestions and seems eager to learn. Comment:										
9. Has good communication skills and rapport with faculty. Comment:										
10. Seems to enjoy optometry. Comment:										
11. Considering everything, how would you rate this student on a 1-5 scale? (Use 1 as poor and 5 as excellent). Comment:										
12. I would refer members of my family to this individual for vision care. Comment:										

Use the space below to make additional comments.

Faculty Signature

Tracking Student Clinical Performance Using Computers and Behavioral Objectives

Roger L. Boltz, O.D., Ph.D., Marcus Piccolo, O.D.
Jay Rumsey, O.D., Norman Leach, O.D., M.S.
Judith Perrigin, O.D., Sam Quintero, O.D.

Introduction

The primary care clinical teaching program of the University of Houston College of Optometry is administratively made up of several types of faculty, headed by the associate dean for professional studies. Module directors are responsible for supervision of discrete clinical units. These individuals oversee patient care, implement educational objectives, schedule students, ensure adequate student-patient exposures, and perform other administrative duties. Clinical coursemasters, one for each of the clinical years, are responsible for establishing educational objectives and ensuring that students meet them. The chief of primary care services coordinates the two groups and chairs the Primary Care Clinic Council.

In the past, the clinical evaluation system consisted of evaluations made at the mid-term and end of semester by each faculty member for each student observed. No individual patient encounter evaluations were made. A faculty member who determined that a student was failing recommended that grade to

the associate dean. However, in most cases, except for the mid-term or end of semester report, no documentation of the student's performance was available; this situation made it difficult to counsel the student regarding the necessary remediation. In addition, marginal, but not failing students often were not identified.

A few years ago, the Clinic Council decided to improve the quality of student evaluations by instituting specific behavioral objectives for each year. These objectives were written by each coursemaster and modified and approved by the entire Clinic Council for inclusion as a seventeen-page section of the Clinic Manual of the College.

Behavioral Objectives

The broad educational goal of the first year of optometry school is for students to learn certain test procedures such as the basic optometric examination, binocular refraction, and health assessment techniques. In addition, the students should begin to interpret the results of such tests. With this in mind, specific behavioral objectives were written (see Table 1 for example).

At the beginning of the second year, our students assume responsibility for direct patient care. Therefore, during this year, they are expected to rapidly develop skills and knowledge and must meet specific behavioral objectives. In addition, the students are expected to learn new procedures and to begin to make accurate assessments and appropriate treatment plans.

During the third year, the education in the clinic becomes more extensive as

the students demonstrate skills on new patient categories such as contact lens wearers, the elderly and pediatric patients. More emphasis is placed on

TABLE 1

OPT I

Monocular Subjective

- Use Far P.D.
- Target - Entire chart with 20/15 as smallest line
- Starting with lenses from X-CYL test add 0.25 D plus sphere and ask which view is better

OPT II

Perform Accurate Refraction

- Retinoscopy accurate to 0.50 D and 20 deg
- Subjective accurate to 0.25 D and 5 deg

OPT III

Adult Module

- Test for and appropriately prescribe for near and intermediate vision in patients over 40 years old

Contact Lens Module

- Interpret lens/cornea relationship (using fluorescein)

OPT IV

- Perform appropriate vision care diagnostic procedures and formulate appropriate treatment plan to meet the patient's needs

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assessments and management plans than in prior years.

During the fourth year, more emphasis is placed on refining integrative skills within primary as well as specialty areas of optometry.

In each year, the behavioral objectives become more general. However, the student, as he/she progresses through the curriculum, is responsible for the objectives from previous years.

Evaluation at Patient Encounters

Each patient encounter is evaluated in two ways: a yes/no evaluation for each of the specific behavioral objectives and an evaluation of the overall performance of the student with this particular patient. The specific behavioral objectives are slightly different for each of our clinical activities, e.g. primary care examination, contact lens examinations, etc. However, the general format of the evaluation is the same (Table 2). Each of the items 11-23, which are categories of tests, refer to specific behavioral objectives in the Clinic Manual. The student is evaluated within each item on a yes/no/not observed basis—yes, he/she did meet the behavioral objective; no, he/she did not; or the item was not observed. In order to reduce faculty time in marking the form, items 11-23 may be left unmarked, if passed, and they will automatically default to a pass.

Item 24 is a rating of the difficulty level of the patient encounter (1 = easy/5 = difficult). Item 25 is an overall rating of the student's performance with this patient (Table 2). The evaluation system

is designed so that if the student meets the behavioral objectives, he/she receives a score of "Expected." If the student performs above the expected level for a student of his/her experience, he/she receives a grade of "Above Expected." If the student exhibits superior performance, he/she receives a grade of "Exceptional." Grades higher than an "Expected" must be documented with a comment, in writing, indicating what the student did to receive a high grade.

If the student exhibits performance deficiencies, but not sufficient deficiencies to warrant failure, he/she receives a grade of "Below Expected." If the student exhibits serious deficiencies which jeopardize the patient's health, comfort, and/or visual efficiency, he/she receives a grade of "Failure." Grades below "Expected" must also be documented with a comment, in writing, indicating what the student failed to do correctly.

As can be seen from this rating system, the average student should have an average rating score of 3.0 for a semester's work. Using this as a starting point, the identification of poor and excellent students should be made more easily than relying on purely subjective criterion based on performance over a whole semester.

In order to make the recording and reporting of these evaluations easier and more meaningful, we instituted a computerized system in the Fall, 1987. We are currently using a mark sense form for data entry, similar to those used for computer scoring of examinations. On this form, the student enters his/her student number, the patient's chart number, a faculty identification

code, and a clinic identification code. The scorings for the evaluation section are done in the section numbered 11-25, with each item from the behavioral objective category (Table 2) corresponding to an item number to be marked on the form. Comments for excellent or deficient performance are written along the top margin or on the back of the form.

The data are entered into a Sperry personal computer using a scanner which reads the evaluation forms. This information is then able to be processed in a variety of ways using a data base file management program so that summary statements can be obtained.

We currently obtain several types of summary statements. These statements

Figure 1
Frequency histogram of mean clinic scores for the OPT III clinical year for the Spring, 1987 semester

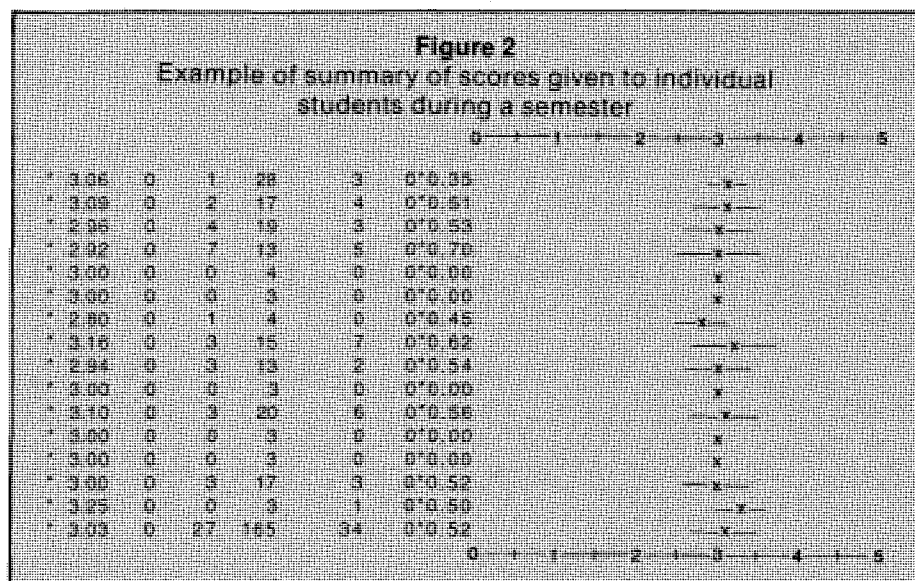
Filename	yr 3.11c
Number of values	= 52
Minimum Value	= 2.9100
Maximum Value	= 3.6500
Median	= 3.2900
Pop. Mean	= 3.2815
Pop. Std. dev.	= 0.1718
Pop. Variance	= 0.0295

Histogram display

2.90	3.00	###
2.92	1.00	#
2.94	1.00	#
2.96	0.00	
2.98	0.00	
3.00	2.00	##
3.02	1.00	#
3.04	1.00	#
3.06	3.00	###
3.08	0.00	
3.10	4.00	####
3.12	4.00	####
3.14	0.00	
3.16	1.00	#
3.18	4.00	####
3.20	2.00	###
3.22	5.00	#####
3.24	4.00	####
3.26	5.00	#####
3.28	3.00	###
3.30	4.00	####
3.32	5.00	#####
3.34	1.00	#
3.36	3.00	###
3.38	4.00	####
3.40	4.00	####
3.42	7.00	#####
3.44	2.00	##
3.46	4.00	####
3.48	1.00	#
3.50	1.00	#
3.52	1.00	#
3.54	0.00	
3.56	4.00	####
3.58	0.00	
3.60	0.00	
3.62	1.00	#
3.64	1.00	#

TABLE 2

Primary Care Examination	Contact Lens Examination
11. Case history accurate and complete	11. Case history accurate and complete
12. Preliminaries	12. Preliminaries
13. Distance refraction	13. Distance refraction
14. Near refraction/Acc. assessment	14. Near refraction/Acc. assessment
15. Binocularity	15. Binocularity
16. External evaluation	16. External evaluation
17. Internal evaluation	17. Internal evaluation
18. Problem assessment	18. Problem assessment
19. Treatment plan appropriate	19. Treatment plan appropriate
20. Patient interaction appropriate	20. Patient interaction appropriate
21. Exam efficiency	21. Exam efficiency
22. Case presentation/Communications	22. Case presentation/Communications
23. Exam record completed properly	23. Exam record completed properly
24. Difficulty level (1-5)	24. Difficulty level (1-5)
25. Overall performance (1-5)	25. Overall performance (1-5)



include an overall average score and distribution of scores (Fig. 1) for all the students for each clinic year and the individual averages for each of our students (Fig. 2). This information enables us to identify the students with high scores and those with low scores in need of remediation.

Armed with the computer-generated summary scores, each faculty member completes a subjective mid-term and end of semester evaluation of each student. Then, twice each semester, we hold meetings of all the clinical faculty who have taught the students of a particular clinical year. During this meeting, each student's performance is discussed, based on each faculty's review of the individual computer-scored patient encounter evaluations they have given that student. As a result of these discussions, the students who are identified as being among the best are sent letters of excellence. Those students who are performing below expected levels are either given a failing grade for that semester, in which case they must repeat the semester; are recommended for suspension; or are placed on clinic probation. The exact step taken depends upon guidelines set forth in the Clinic Manual.

Placing a student on clinic probation means that the student is currently performing below standards, but not badly enough to warrant failure. When a student is placed on clinical probation, he/she is counseled by the appropriate coursemaster, and a program of remediation is planned. The student is then given a specified time period, usually 8-16 weeks, in which to bring his/her skills to at least the average level of his/her peers. If the student does so,

he/she is taken off probation. If the student fails to do so, he/she must repeat the semester or is recommended for suspension, depending on the individual case using the guidelines in the Clinic Manual.

Evaluation

We hope to move from our current Pass/Fail clinic grade to a letter grade as the system is adjusted. However, in order to make this change, several issues need to be resolved. First, we must be assured of uniform grading among faculty members so that each faculty member will give the same score to similar clinical performances. Second, we must decide how to distribute the grades among the clinical scores.

In order to determine how well the new evaluation system is working and whether a letter grade assignment can be made based on the student's average score, we have examined the summaries for the past two semesters. In most cases, grade inflation is more likely to occur than are low grades. When we examined the average grades for the Spring, 1987 semester, we found the mean of all students to be 3.26. For the Fall, 1987, the mean grade was 3.05. The lowering of the average from Spring to Fall may indicate that a bit of grade inflation took place in the Spring, but, that as the faculty became more familiar with the system, the scores are closer to 3.0.

Alternative explanations also must be considered. Students in the Fall semester are not as experienced as those in the Spring semester and therefore should not be expected to perform as well. The evaluation system is designed to account for this, but may not have

done so. Longer term tracking of evaluation scores should enable us to determine how well the system is operating.

In order to determine how accurately grades might be distributed using the clinic grading scores, we investigated whether the student's scores reflected the more subjective evaluations which were obtained during the midterm and end of semester faculty evaluation meetings. In the Spring, 1987, semester, the mean score was 3.28 with an S.D. of 0.17. Using a criterion cutoff of 1 S.D. above or below the mean, we determined that 28 students had scores which would place them in the category of excellent clinicians and 14 students were in the category of weak clinicians. Comparing these evaluations to those obtained from the faculty meetings, 12 of the 28 students with scores more than 1 S.D. above the mean were subjectively judged as excellent and 16 were judged as average clinicians. In addition, 7 students were judged subjectively to be excellent, but had scores less than one S.D. above the mean. Of the 14 students who had scores 1 S.D. or more below the mean we found that 9 were also subjectively judged as being weak and 5 were subjectively judged as being average.

It appears that we are only doing a fair job of identifying the best students based on grade scores (12 of 19). In addition, less than half (12 of 28) of the students with scores 1 S.D. above the mean were identified subjectively as being excellent. Part of this problem may be caused by the way in which we identified the excellent students. In order to be classified as excellent, the student would have been in that category in at least a majority of clinics. A student could perform very well in one area, but not outstandingly in other areas and therefore obtain a high overall score, but not be subjectively classified as excellent.

Computer graded scores appear to do a better job of identifying the students at the lower end of the spectrum (9 of 14). However, we need to adjust the system before it can be used to determine letter grades.

The mean score of the Fall, 1987, semester was considerably lower than that of the Spring, 1987, semester reported above. Since faculty members have had additional time to work with the new system, they may be more accurately identifying the best students than they did in the Spring, 1987. We are optimistic that with more experience the clinic computer-graded scores will aid in accurately determining the student's level of clinical performance. □

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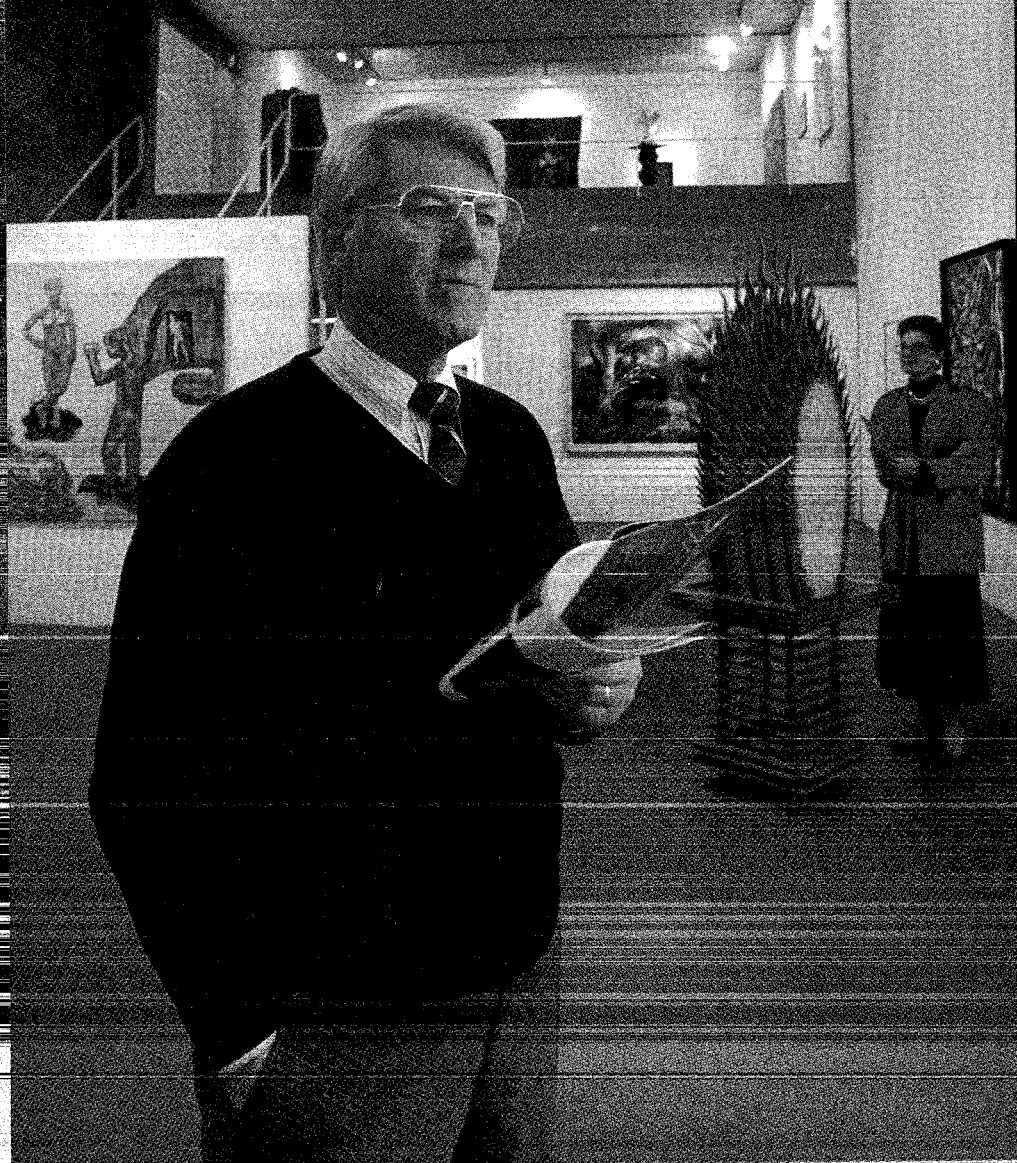
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