Glaucoma detection is an important preventive health measure. Its incorporation into medical practice has been difficult. This report describes how it has been introduced into group medical practice and with what success. Significant is the employment of nonmedical personnel to perform tonometry.

INTEGRATING GLAUCOMA DETECTION INTO GROUP MEDICAL PRACTICE

Irving S. Shapiro, Ph.D., F.A.P.H.A., and Harry H. Levine, M.D., M.P.H., F.A.P.H.A.

The National Picture

"ONE out of every 50 Americans over age 40 has glaucoma. Glaucoma is the second leading cause of blindness (senile cataract is first). Over one-third of a million Americans are blind; of these 40,000 are blind from glaucoma. Nearly a third of all the blind are middle-aged, and over one-half of all the blind are people over 65 years old. The problem is growing as the nation's population grows older. By 1965, the age group over 65 is expected to reach 20 million. It is estimated that there are at present over 1.2 million people with unsuspected glaucoma in the United States. Assistance to the blind for only one year costs $85 million. This does not include personal income lost by the handicapped person through inability to earn a livelihood or other personal family expenses that are incurred.

"Those are the cold facts. They represent a challenge to the public health profession, because the number of persons blinded by glaucoma each year is increasing."

What has just been quoted is from a recent Public Health Service publication.* Another cold fact is that there just are not enough ophthalmologists in the United States today to meet this challenge alone, even should they wish to do so. In 1960, only 5,053 ophthalmologists had been certified by the American Board of Ophthalmology. These few specialists could not possibly provide the eye care needed by the nearly 190 million people residing in the United States during that year. In addition, many ophthalmologists do not routinely do tonometry on their patients over 40. Efforts to encourage family physicians to practice routine tonometry are unlikely to succeed, we believe, on the basis of our own attempt to do so a few years ago. There are also 18,500 optometrists active in the United States and they see an estimated 37 million patients annually. It would seem logical for them to do tonometry when they refract their patients, but in most states they may not legally put an anesthetic in the eye.

* "Prevent Blindness—Screen for Glaucoma." U. S. Department of Health, Education, and Welfare. PHS Publ. No. 932. Washington, D. C.: Gov. Ptg. Office, 1962.

The HIP Focus

Two and a half years ago, the New York Association for the Blind, (The Lighthouse) * and the Health Insurance Plan of Greater New York, agreed jointly to sponsor a project intended to take up part of this challenge. The primary objective of this project is to encourage HIP Medical Groups to explore how tonometry for subscribers 40 years and older, performed by trained nonmedical personnel under the supervision and guidance of a physician, might be incorporated into medical group practice. The assumption is that it is advantageous and administratively feasible for medical groups to offer such tonometry as a regular service and that once the procedure is established on a continuing basis, the numbers of people screened will mount continuously. Because of the organization of HIP Medical Groups, follow-up of suspected cases could be complete, with assurance of continuing, qualified medical supervision which unfortunately may be lacking or impossible in some communities.

The Program in Detail

The development and direction of this project was placed primarily in the hands of the director of the Health Education Division of HIP. Actively associated with him has been an associate medical director, designated as medical consultant. An experienced technican-teacher was employed full time by HIP to train nonmedical personnel to perform tonometry. Many physicians and others active in the study and screening of glaucoma in medical schools, hospitals, voluntary and official agencies, and in the community were consulted.

Literature on the subject, intended for professionals and the public, was reviewed. Films and exhibits were also examined. A technic for performing tonometry was defined and an outline for training technicians was prepared. The necessary equipment and materials were procured. Announcements, instructions, and informational literature for distribution to patients at different times during the program were prepared. A special form for joint use by technicians and ophthalmologists was devised to serve as part of each participating patient's clinical record, and as the basis for statistical summaries.

The Medical Groups in HIP were then invited to participate in the program if they would designate one or more members of their staff (such as nurses or technicians) to be trained, and if they would offer this screening procedure to subscribers 40 and over who were visiting their medical center for any of a variety of medical services. Because of the exploratory nature of this project, with its limited funds and personnel, it was recognized that only a few of the 32 HIP Medical Groups could be involved. Each of the Medical Groups which expressed interest was visited for discussion with medical directors, ophthalmologists, and administrative personnel.

The training consisted of about ten hours of supervised work for each trainee with approximately 25 tests on staff volunteers, not patients. Most nurses and technicans who either volunteered or were designated by their superiors for training readily learned the technic. Very few (five out of 35) who started training dropped out because of personal discomfort while handling the tonometer or dealing with patients.

A screening level of 22.4 mm Hg with the Schiötz tonometer is employed and persons whose tonometer scale reading with the 5.5 gm weight is 3.5 or less are referred to the ophthalmologist for examination and evaluation. Also referred are persons with a difference in

* With the cooperation and financial assistance of the John LaPorte Given Foundation.

pressures between the eyes of two or more tonometer scale readings (about 6 mm Hg).

Factors Affecting Success

Because each Medical Group which has become involved has its own internal administrative structure and set of professional relationships, each participates in its own way, at its own speed, and with varying reactions to the steps necessary to implement this exploratory project.

Overall, the factors which directly affect the pace of progress may be divided into two major categories: preparatory steps, and internal Medical Group considerations. The preparatory activity took a fair amount of time because the pertinent literature collected for review was large and scattered; because procedures, forms, and literature had to be created (rather than copied or adapted from existing material) and cleared with the many individuals concerned; and because the equipment and materials which had to be purchased, particularly the tonometers, were slow in arriving.

Of greater interest, perhaps, are the internal Medical Group factors which contributed so much to the extent and speed of participation. Many problems or difficulties can be listed, but of course no one Medical Group raised or faced all of these. Some of the considerations in some of the groups which had to be met in order to achieve any success follow:

I. The Trainees (Recruited from the Staffs of the Medical Groups)

(a) There were not enough nurses or technicians available, or they were so heavily burdened with regular work that none, or few, could be assigned.

(b) Trainees who were designated by the professional or administrative staff could give only very limited time—and often interrupted and irregular time—to training.

(c) Vacations, illness, and surges of emergency or personal work meant trainees became unavailable through their absence from the medical center, or because they were needed elsewhere within it.

(d) The trainees designated by administrators were resistant because of the "extra work," or the lack of special compensation or recognition.

II. The Physician (Ophthalmologists, Medical Directors, Others)

(a) Only a few, if any prospective trainees, were considered by the physicians concerned as possible candidates for training.

(b) The ophthalmologist was reluctant to agree that a technician could be trained to do tonometry skillfully.

(c) The ophthalmologists feared the possibility of unnecessary referrals. They also did not want the burden of supervision or responsibility for newly trained personnel.

(d) There was uncertainty about legal precedents or protection.

(e) Some felt the tonometer as a detection tool had considerable limitations.

(f) There was lack of knowledge or conviction that one might correctly anticipate a finding of unsuspected glaucoma in two out of 100 screened, among their subscribers 40 years old and over. Also there was uncertainty that even if this 2 per cent was uncovered, the effort and expenses involved would be reasonable.

III. Administration (Administrators, Supervisors, Setting)

(a) When key medical or administrative personnel were absent, training was delayed or suspended.

(b) The administrative or supervisory

staff felt burdened by the additional work involved, or were too involved in other special work for a time.

(c) There was lack of physical space, in general, or during most of the week when patient traffic is heavy.

(d) The need to submit suggestions, plans, and procedures for review to several ophthalmologists, the medical director, the administrator, and often others, was time-consuming and created uncertainty about follow-through on decisions.

(e) There was a need to initiate the program only for a particular segment of the visiting patient population: those coming to the eye department, those coming for ECGs, those visiting one particular internist.

A degree of persistence, flexibility, persuasiveness, and imagination are most helpful in overcoming some of these obstacles. A small amount of financial support, to cover costs to the Medical Group of releasing a nurse or technician to be trained, has also proved useful.

Summary of Achievement

At the end of the first year of the program (1962), it was felt a good base had been laid, and a promising start made toward achieving the broad objective. Three Medical Groups had initiated programs and had screened about 500 people. At the end of the second year of the program (1963), there were nine Medical Groups with an active program utilizing nonphysician personnel trained through this project. In addition, there were 12 other Medical Groups with whom varying degrees of promising discussion had been initiated. During the second year, an additional 2,000 people had been screened. Of the 2,800 persons screened thus far (including 1,000 nursing home patients over 65), 6.3 per cent were referred to the ophthalmologist for evaluation. Of the total screened, 2.6 per cent were diagnosed as glaucoma, and 0.7 per cent as glaucoma suspect and/or placed under observation. Of the 72 cases diagnosed as glaucoma, only five were previously known.

A total of 25 nonphysician personnel have been fully trained to do tonometry, and others are currently in training.

The Future

We estimate that a fully trained nurse or technician in a Medical Group, working under medical supervision but without clerical or other assistance, and keeping records, can screen 12 persons an hour. (In more typical mass screening programs, where clerical and traffic details are handled by others, 30 per hour may be screened.) A worker who puts in two hours a week and sees 25 patients, aged 40 and over, can screen 1,000 persons in 40 weeks, and thus uncover about 20 previously unknown cases of glaucoma yearly. If her time is worth two to three dollars per hour, the total cost, including the expense of two tonometers, other equipment, anesthesia, and supplies would average less than $400 yearly. This does not include the cost of training, physical facilities, or the ophthalmologist's time used to evaluate those referred to him who are found not to have glaucoma. These "false-positives" may be reduced if patients found to have elevated pressures are screened by the technician a second time (at a later date), and are referred to the ophthalmologist only if their pressure is still high.

We have measured success in our program thus far in terms of the number of Medical Groups willing to have nonmedical personnel trained and then to budget time for them to perform tonometry. We anticpate that when the

number of patients screened within any one Medical Group reaches the order of 500 or 1,000, the findings will approximate the 2 per cent forecast. Most likely these groups will decide that the effort is worth while for their patients from a medical point of view, in terms of preventing blindness. and that it is feasible and economical from an administrative point of view as well.

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Dr. Shapiro is director, Health Education Division, and Dr. Levine is associate medical director, Health Insurance Plan of Greater New York, N. Y.

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