OUTCOMES OF THE APPLICATION OF THE OPTOMETRISTS ROLE AS PRIMARY HEALTH CARE WORKERS*

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Abstract

By education, training, and in many jursidctions by statutory provision, optometrists play a comprehensive role as primary health care providers. The widespread distribution of optometrists in North America and other highly developed countries contribute to their ability to apply this role. Experience within service programs of the School of Optometry of the University of Waterloo show the role is also applicable to such diverse remote and underdeveloped regions as the Canadian North and various Caribbean and African countries. The high prevalence of visual anomalies among those who are healthy and an increased prevalence of such anomalies as well as impaired visual function among those in ill health result in optometrical practices being primary points of entry ot the health system. The optometrist thus has considerable opportunity for health education, health surveillance, health maintenance, as well as the application of specific optometrical therapies.

Documentation of optometrical activities in various service programs of the School of Optometry directed toward general and specific segments of the Canadian population demonstrate the effectiveness of this role in both rural and urban settings.

The paper cites the results of the application of the Primary Health Care role with data drawn from general populations in Canada and such specific underserviced populations as the institutionalized aged, the mentally retarded, preschool children, Canadian Eskimo, as well as small isolated Northern Ontario Communities.

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L'éducation, la formation professionnelle et dans certaines jurisdictions une provison statutaire, équippent l'optométriste pour la tache de pratitien de première lighe. La distribution des optométristes au Canada, aux Etats-Unis et ailleurs dans les pays développés renforce ce role de l'optométriste.

L'expérience acquise par l'école d'optométrie de Waterloo dans ses cliniques externes démontre que ce rôle est possible dans les régions éloignées du nord Canadien et les pays de la Caraïbe et de l'Afrique.

La haute fréquence des anomalies visuelles parmi la population bien portante et une augmentation de cette fréquence aussi bien qu'une diminution de la fonction visuelle chez la population en mauvaise santé amène la population à consulter l'optométriste confirmant ainsi son rôle comme praticien de première ligne.

Cette situation permet à l'optométriste de faire de l'éduation populaire et de surveiller et maintenir la santé de ses patients sans omettre la pratique de sa profession vis à vis de ces mêmes gens.

Les résultats des différents projets des services de clinique externe de l'école démontrent bien l'application effective de ce rôle de l'optométriste à l'endroit de populations spécifiques candiennes tant urbaines que rurales.

Ce travail présente les résultats de l'application du rôle de l'optométriste comme praticien de première ligne à l'endroit de divers groupes de notre population: population générale, les personnes agrées, les handicappés mentaux, les enfants d'âge préscolaire, les Inuits, et quelques petits villages isolés du nord de l'Ontario.

When definitions of primary health care are compiled,[1] a number of elements common to many of the definitions can be abstracted. Among the more common elements are the following:

1. It is the first health service contact for the person with health needs.
2. The patient is usually ambulatory.
3. The problems for which primary health care is sought usually have broad distribution among the populace and most of the conditions can be cared for by the professional providing the first contact, that is, it is comprehensive.
4. The health care provider is accessible.
5. The service is coordinated with other health services and has continuity and accountability.

A majority of definitions recognize that a spectrum of health care providers are active in rendering primary care, for example, Tonkin says,[2]

Primary health care is a complex process involving a basic level of services with a broad orientation and provided by a variety of health professionals who offer some form of continuity of care. Differentiation of health problems is a key element in the process and requires that primary health care providers perform three essential functions—as guardian, gatekeeper and chronicler.

Optometry is identified as one of the professions providing primary health care in many professional and governmental documents.[3,4,5] In this paper I wish to examine optometry's activities in Tonkin's three essential functions.

The curriculum of optometrical education provides the basis for the activities of the profession in primary vision and health care.

Students in Optometry enter a four year professional program after from two to four years of preparation in the sciences basic to health education, i.e. biology, physics, mathematics, chemistry and psychology. Each of these science streams are expanded in advanced courses during the professional program.

Optometry programs include in depth study of embryology, anatomy, neuro-anatomy, physiology, both normal, abnormal and ocular, general and ocular pathology, organic and biochemistry, geometrical and physical optics and physiological optics as the more important core subjects. Clinical sciences and clinical care of patients plus social, legal and administrative functions form the balance of the curriculum.

The primary vision and health care role which this educational process fits a graduate to fulfill has been extensively described.[6] The role encompasses guardianship, gatekeeping and chronicling and encompasses primary, secondary and tertiary levels of prevention.

What does Tonkin mean by guardianship, gatekeeping and chronicling? Guardianship means accepting responsibility for an individual's care, performing specific caring function, and in the caring process, establishing an ongoing relationship. Gatekeeping describes a health provider who is aware of the available health resources and who knows how to facilitate entry to these resources for the client. The chronicler's role consists of originating, maintaining health records and communicating with patients and other health providers on those facts in the record which are important to the client's health maintenance.

Are these functions part of optometric training?

Optometrical clinical training and education programs take place within clinics at the University as well as many community locations remote to it where these functions are practiced by faculty and students. These internal and external clinics are becoming increasingly integrated into the organized health care system. Today's optometry graduates by the time of graduation are prepared and competent to meet most situations that are found in day to day practice and to communicate with patients and other health workers. The optometrist is prepared to diagnose and manage approximately 95% of the most prevalent anomalies that trouble human vision. The optometrist is also competent to detect and recognize both general and ocular disease, the side effects of medication, provide spectacles, contact lenses, orthoptics and vision training and to counsel and advise the patient on ocular problems and to refer the patient when the problem lies outside his scope of practice or level of competence. The optometrist is also prepared to accept the responsibility of supporting the health activities of other workers within the health care field and to maintain records supportive of such responsibility.

Most ocular problems and many general health problems manifest themselves in altered visual function or some change in ocular structure. Thus, many people use the optometrical practice as an initial point of entry to the health care system. They generally enter an optometrical practice with minimal anxiety regarding their vision or health. They develop strong personal relationships with their optometrist. Most optometric patients are also ambulatory. Few population centers of 2000 or over population are without optometrical services either full or part time and thus optometrical services are readily accessible to a majority of the population.

Of the health problems which beset mankind, vision and ocular anomalies are second in prevalence only to dental caries.

Optometrists are fully capable of providing care for the majority of the public with vision and ocular anomalies. Even in the presence of a broad spectrum of physician's services, optometrists continue to provide the majority of eye care services. For example, Catania[7] has shown that in a large group health practice 70.5% of the vision and eye problems were managed by optometrists, 28.0% by physicians and ophthalmologists and 1.5% by ophthalmic technicians.

Thus by education, training and practice, otpometrists fulfill the functions of guardianship, gatekeeping and chronicling. Optometric practice in Canada is generally carried out by individuals or groups of two or more optometrists in private offices and as a result optometrical activities and the extensive interchange between optometrists, physicians, ophthalmologists, dentists, nurses, social workers and other members of the health care team have not been widely documented or reported. Neither is the value and extensive use of optometric health records generally appreciated. The outcomes of optometric work remain unknown except to the individual who benefits.

To remedy this situation the various vision care programs of the School of Optometry, University of Waterloo have been extensively documented in the process of epidemiological studies and thus provide an excellent source of the material for the examination of the outcome of the optometrist's role in primary care.

The programs examined range from pediatric to geriatric populations and they encompass both community and institutionalized samples and include ethnic minorities such as Amerind and Eskimo peoples. They also include groups identified by handicaps, such as the mentally retarded and by geographic location such as the unorganized municipalities of Northern Ontario. Collectively these populations are representative of Canadian society. It is thus likely that the outcomes reported are representative of optometric practice in Canada.

Service to Small Isolated Northern Ontario Communities[8]

In Northern Ontario a Mobile Optometric Clinic housed in a 35 foot specially designed and equipped trailer visited 23 small communities with populations between 100 and 750 persons between May and August, 1976. Table 1 shows the outcome of 1181 primary care contacts with the optometry team. Table 2 shows the prevalence of vision anomalies among this population.

While table 2 provides percentages of the population with various vision anomalies, a number of persons had multiple problems. The total requirement for optometric vision care services exceeded 48% of

all those who attended the clinic. This population ranged in age from one to over 80 years of age. There were 47 persons (4%), all of whom were ambulatory, identified as requiring a physician's assessment. In addition to the foregoing 47 persons, the specified need for health education and counselling in regard to compliance with health treatments, and assessment for drug side effects can be estimated by considering that 312 persons either had a health problem or a familial history of health problems. The continuing need for oculo-visual assessment services is evident in both the high prevalence of visual anomalies as shown in table 2 and in the fact that 363 ocular health problems were also present.

Service to Institutionalized and Community Based Mentally Retarded Persons[9,10]

From September 1974 to August 1975 the Optometry Clinic at the Huronia Regional Centre for the Mentally Retarded examined 1242 residents. The age of this population ranged from six to 83 years, 74% of these were less than 29 years old. Of this population, 54% were found to have one or more ocular pathology conditions. Table 3 shows the interprofessional activity related to ocular pathology within the hospital unit over one year's time. Due to the fact that the residents are under the constant care of physicians there is less likelihood of detecting undiscovered systemic pathology. There is frequent consultation between physicians and optometrists on systemic health of residents, particularly in regard to ocular side effects of systemic medication. Thus, the optometrist to physician referrals were not recorded except where referral was for an ocular pathology. Periodic review of all previously diagnosed ocular pathological states occurs on a planned schedule.

A sample of 168 mentally retarded in the schools of the Waterloo Region was also assessed by optometrists from the University of Waterloo. Table 4 shows the extent of physician-optometrist consultations regarding the persons in this sample. In all 168 there was interaction between optometrist-nurse-teacher-psychologist either verbally or in writing. In Table 5 the visual conditions requiring optometrical diagnosis and therapy are contrasted for these institutional and community based mentally retarded populations. While approximately 50% of the retarded persons living in the community require optometrical therapies, the need within the institution increased to over 66%.

As 62.9% of the institutionalized population were taking prescribed medication, a compilation of the possible side effect of these drugs was made and the residents were examined for such effects in the Optometry Clinic. A number of side effects have been found and this has resulted in the origination of a specific protocol of examination for such side effects at each oculo-visual examination. This activity has required a considerable increase in consultations between optometrists and physicians. Among the retardates residing in the community, only 20.0% are on prescribed medication. No ocular side effects of drugs was found during the oculo-visual assessment of this group.

Within both institutional and community primary care settings for the retarded, optometrists confer with nurses, psychologists, social workers, teachers and ward aids on almost all patients. The optometrist is also a regular participant in the health and rehabilitation conferences held for all residents and new admissions to the institution.

Table 1

PREVALENCE OF OCULAR AND SYSTEMIC HEALTH PROBLEMS DETECTED AMONG RESIDENTS OF SMALL ISOLATED NORTHERN ONTARIO COMMUNITIES BY AN OPTOMETRIC TEAM

	No.	%
Optometric Oculo-Visual Assessments	1181	
Referred to Physician with previously undiagnosed health problem	13	1.1
Referred to ophthalmologist with previously undiagnosed ocular health problem	18	1.5
Eyes with elevated intraocular pressure referred to ophthalmology	16	1.4
Referred to nurse for counselling with health problems	1	0.1
General health problems with diagnosis or treatment reported in case history	201	17.0
Family health history of hypertension and diabetes	111	9.4
*Total ocular health problems present with or without medical diagnosis	363	

*A number of persons showed multiple ocular health problems thus no percentage of the population is shown since such a percentage is not meaningful.

Table 2

PREVALENCE OF VISION ANOMALIES AMONG PERSONS IN SMALL ISOLATED NORTHERN ONTARIO COMMUNITIES

Vision Anomaly	% of Population
Myopia	20.3
Hypermetropia	8.5
Astigmatism	7.0
Anisometropia	14.6
Presbyopia	17.5
Amblyopia and muscular anomalies	5.3
Low vision	2.2

Table 3

NUMER OF INTERPROFESSIONAL REFERRALS BETWEEN OPTOMETRISTS, FAMILY PRACTICE PHYSICIANS AND OPHTHALMOLOGICAL CONSULTANTS AT THE HURONIA REGIONAL CENTRE FOR THE MENTALLY RETARDED OVER A ONE YEAR PERIOD

	No.	%
Referred to ophthalmology by physicians	53	4.3
— Requiring treatment	28	—
— Requiring no treatment	25	—
Referred to optometrists by physicians	70	5.6
— Treated in infirmary by physicians post referral	53	—
— Treated by ophthalmologists after referral	13	—
— No treatment	4	—
Number of residents with one or more ocular pathology present	669	54.0
Number of residents requiring review of ocular tissues and visual functions for ocular side effects of drugs	781	62.9

This results in the visual capabilities and ocular problems being taken into account in planning health, education and rehabilitation training programs which are established for each individual. Ward aids are also coached on the necessity for the continuous use of optical appliances and are trained to encourage their proper use and wear. Controlled studies[11] have indicated that correction of vision anomalies has salutory effects on a wide spectrum of behavior among mentally retarded popultions.

Vision Care Requirements of Belcher Island Eskimos[12]

A group of 138 persons who constituted 76.6% of the Belcher Island Eskimo population were examined in 1971 by an optometrical team from the School of Optometry, University of Waterloo. An ophthalmological resident was also present during the working visit along with a family practice physician. He assessed all ocular pathologies detected and referred by the optometrists. A total of 10.1% of the population required referral to his service for ocular pathology assessment. The optometric team found 25.4% of the population required optometric therapy. Table 6 shows the number of pathologies detected and the number of persons requiring medical treatment. Of the treatable ocular conditions, only one case required one specialized judgement of an ophthalmologist. The balance could have been managed by a family physician. Table 7 shows the numbers and kind of visual anomalies detected by the optometrists.

The Institutionalized Aged in Ontario Residential and Nursing Homes[13]

In a comprehensive survey of 43 residential and nursing homes, the institutionalized aged have been shown[11] to have a high prevalence of ocular and visual anomalies. Acting as primary health care practitioners within these institutional settings, optometrists and optometrical internes of the School of Optometry examined 1112 individuals and recorded the data shown in Tables 8 and 9. When it is considered that this population is monitored by both physicians and nurses, the data shows the added value of a third

Table 4

Number of Optometry Referrals and Consultations With Physicians and Ophthalmologists Regarding Ocular Conditions Among a Community Sample of Mentally Retarded Children

	No.	%
Referred to ophthalmologists for undiagnosed ocular health problem	7	4.3
Detected ocular health problem with prior physician's diagnosis	20	12.4
Children evaluated for ocular side effects of drugs	35	21.6

Optometrists conferred with the family physicians in all cases where the child was on medication

Table 5

Prevalence of Visual Problems of Mentally Retarded Populations in Institutional and Community Settings

Visual Problem	% Institution Population	% Community Population
Myopia	17.9	17.5
Hypermetropia	35.4	23.3
Astigmatism	28.9*	19.7
Anisometropia	11.3	19.1
Presbyopia	9.5	0.0
Amblyopia and muscular anomalies	24.2	24.7
Low vision	9.2	3.7

*While 57.3% of the population require spectacle correction only 4.0% require correction for astigmatism only.

Table 6

Prevalence of Ocular Pathologies Among a Population of Belcher Island Eskimos

	No.	%
Total ocular pathologies detected and referred	52	—
Total ocular pathologies requiring treatment	14	10.1

Table 7

Prevalence of Visual Anomalies Among a Population of Belcher Island Eskimos

Visual Problem	%
Myopia	6.9
Hypermetropia	6.9
Astigmatism	12.0
Anisometropia	Not Recorded
Presbyopia	4.2
Amblyopia & muscular anomalies	6.5
Low vision	0.0

Table 8

Enumeration of Optometrical Referrals for Ocular and systemic Disease Among 1112 Residents of Nursing and Residential Homes For The Aged

	N	% of N
Persons with ocular anomaly detected and referred to ophthalmology	58	5.2
Persons with an undiagnosed systemic health problem detected and referred to a physician	72	6.5
Discussions with nurses and ward aids were held on all patients	1112	100.0
Referred to ophthalmological evaluation of suspected glaucoma	45	4.0

Table 9

Visual Problems of the Elderly in 43 Residential and Nursing Homes

Visual Problem	No.	%
Myopia		30.1
Hypermetropia		58.6
Astigmatism		20.5
Presbyopia	All except the blind	
Amblyopia and muscular anomales	Not compiled	
Low vision (best corrected acuity 20/70 or worse)	262	23.6
Number requiring immediate vision examination to improve vision (represents unmet need for refractive eye care)	216	19.4

primary care practitioner, the optometrist within geriatric care institutions.

While the items documented among these specific populations are extensive, they do not relate the complete story of optometrical diagnostic and therapeutic services and the counselling, health education and other optometrist's activities which integrate with and support the role of other health workers. Many aspects of the primary care activities do integrate with and support the role of other health workers. However, many aspects of the primary care activities of optometrists still need to be fully explored and documented.

The addition of electrodiagnostic tests, external and internal photography of the eye, dark adaptometry and static and dynamic visual field exploration have already extended the optometrists utilization and integration within primary health care. The data presented leaves little doubt that optometrists play an extensive and effective role in primary care. The full potential of optometrists as guardians, gatekeepers and chroniclers must be exploited to provide the quantity and quality of vision care, eye care and health care needed by Canadians.

References

1. Jonas, S. Some Thoughts on Primary Care: problems in Implementation. *Int. J. Health Serv.* 3, pp. 177-187, 1973.
2. Tonkin, R.s. Primary Health Care. *Can. J. Pub. Health.* 67, 4, pp. 289-94, 1976.
3. DiStefano, A.f. Primary Care and Optometry. *Opt. J. and Review of Optom.* Nov. 1976, pp. 34-7.
4. U.S.A. Dept. of Health Education and Welfare. Health Facility Planning and Development—General Planning Process. Methodology and Criteria Office of Facility Engineering and Property Management, Washington, D.c. 2021, June 1976.
5. Wright, J., Bucar A., Dewey, C., Miller, S.c. Optometry the Professions Role in Primary Health Care. A.O.A. Optometric Care Committee, St. Louis, Mo. March 1977.
6. Woodruff, M.E. Optometry . . . An Underutilized Source of Assistance to the Primary Care Physician. *J. Amer. Optom. Assoc.* Vol. 45, No. 7, July 1974, pp. 822-6.
7. Catania, L.J., Roberts, J.S. Eye Care Delivery in Prepaid Group Practice. Presented at the Group Health Institute, Los Angeles, Calif. June 1977.
8. Woodruff, M.E., Pellowe, R.D. Results of a Vision Care Program for Small Isolated Northern Communities. In preparation.
9. Woodruff, M.E., Cleary, E., Bader, D. The Prevalence of Refractive and Ocular Anomalies Among 1242 Institutionalized Mentally Retarded Persons. *American Journal of Optometry & Physiological Optics,* Vol. 57, No. 2, pp. 70-84, February, 1980.
10. Woodruff, M.e., Bader, D. a Study of the Vision Status of Students in Waterloo Region Schools for the Mentally Retarded. Submitted for Publication.
11. Woodruff, M.E., Bader, D. The Effects of Corrective Lenses on Various Behaviors of Mentally Retarded Persons. In Press, *American Journal of Optometry & Physiological Optics.*
12. Woodruff, M.E., Samek, M.J. The Refractive Status of Belcher Island Eskimos. *Can. J. of Public Health,* Vol. 67, July/August 1976, pp. 314-20.
13. Woodruff, M.E., Pack, G. A Survey of the Prevalence of Vision Defects and Ocular Anomalies in 43 Ontario Residential and Nursing Homes. In Press, *Can. J. Public Health.*