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ABSTRACT

The goals of this program in redefining school health were to (a) create a coordinated, educational interdisciplinary school health model to provide diagnoses, referral, or on-site therapy, as well as prescribe a definitive program for children with learning and behavior disorders; and (b) deliver this program in primary schools as on-site health care based on educational and emotional disabilities, with acute and chronic physical problems referred to outside medical agencies. To accomplish these goals, a school health team was developed which included a school health physician, school nurse, social worker, psychologist, speech clinician, specially assigned full-time diagnostic and prescriptive teacher, and secretary. This team operated in 10 elementary schools in the region surrounding the University of Maryland Hospital. Some of the results from this program were as follows: (a) the number of children referred for learning and behavioral problems increased by 70 percent from the previous year's program; (b) it was noted during the program that children with learning and emotional disorders had a multiplicity of problems; (c) a significantly higher percentage of organic diagnoses was present in children aged 5-6, whereas children aged 9-13 had a higher percentage of functional diagnoses; (d) reports indicated that hyperkinesis is not an unusual syndrome among elementary school populations; and (e) a high response to medication was noted. (Tables of referrals, diagnoses, and medication are provided.) (PB)

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The School Health Team and School Health Physician: New Role and Operation

Until recently, health programs in schools consisted of periodic physical examinations and screenings. However, in 1970¹, and in 1972², as school health came to be viewed as directly related to the learning process, a new role for the school physician emerged along with a new concept in school health care. It is a well documented fact that 10 to 20 percent of the school child population suffers from disabling behavior and learning problems.³ The recognition of this problem suggests the creation of innovative school health care programs with the development of a new pediatric specialist, the school health physician, who has an expanded role in the delivery of care to the school child population.

To fill this new role, the redefined school physician must possess, in addition to adequate training in developmental pediatrics, a sound understanding of school facilities and educational methods. This new emphasis requires the coordinated services of a multidisciplinary team of educational, medical, nursing, and psycho-environmental specialists in the delivery of school health.⁴ Nader and his associates⁵ described such a school health service in one elementary school and suggested that a multidisciplinary approach increased teacher approval, the number of referrals by the teacher, and the number of completed child assessments by the team. The purpose of this paper is to present the design and operation on a coordinated, interdisciplinary, redirected school health program operating within an entire school region in Baltimore City. This program utilized an on-site multidisciplinary school health team supported by a local School Administrative Unit and a University department with broad expertise in pediatrics, child psychiatry, and learning disorders. The paper also suggests that school health be redefined to

include the behavior and learning problems of childhood as the primary priority of all involved professionals.

Methods and Materials

Ten elementary schools within the region surrounding the University of Maryland Hospital were selected after interviews with and recommendations by the public health nurses serving as school nurses and by the school principals in each of the 18 elementary schools in the region. Thus, maximum approval and cooperation was assured.

The total enrollment in these 10 schools was 9,150 children - 6,546, black and 2,604, white. In six schools, all students were virtually black; in two, predominately white; in two, the races were reasonably well integrated. This school health program was responsible for the behavior and learning problems aspect of school health of the children referred from this population as well as appropriate outside referrals for the episodic acute illness care.

The selection and payment of the members of the school health team was a joint project of the Department of Special Education of Baltimore City; the Special Education Division of the State of Maryland; the School Health Division of the Baltimore City Health Department; and the Departments of Pediatrics and Psychiatry of the University of Maryland. The team which serviced the 10 schools consisted of the school health physician, school nurse, social worker, psychologist, speech clinician, specially assigned full time diagnostic and prescriptive teacher, and a secretary. The team was designed not only to identify the child's specific learning and behavior problems but also to provide guidance to parents and teacher and to recommend remedial action. In addition, the team was charged with continuity care of the child to see that he was receiving the specific type of program which they had prescribed. The

speech clinician and the school nurse were previously assigned to the ten schools as itinerant professionals employed by the local school system. The ultimate goal of the model (which is being realized during the subsequent second and third years of operation) is the utilization of already available personnel within the school system who had been working independently prior to this project. These professionals will come together and form the more unified "team" approach and increase effectiveness without measurably increasing cost. Subsequent publications will discuss the results of the new school health process during the second and third years of operation as it has expanded to more elementary schools while continuing on a longitudinal basis within the original ten elementary schools described here.

Within the team, the diagnostic and prescriptive teacher became a particularly unique and professionally important member who was provided by the Special Education Division of the local school system. Although the development of the final plan of management for the specific child was made by the team as a whole, the interpretation of the educational aspects of this plan was carried back to the classroom teacher by the team teacher who had the background to express the feelings and educational recommendations of the school health team to the regular teacher utilizing specific daily operational plans for use within the classroom.

Remediation by the team had the potential of being carried out in one of several ways: the team could select one of its members to follow the family longitudinally and remediate hyperactivity, speech, education, or social maladaptation, etc.; the team could attempt in-service education so that the child's primary educational problems could be handled within the school by the school personnel; or, for the more complex and diverse child-parent problems, the team could refer the child and family to outside agencies. No

matter what remediation was recommended the team periodically met concerning each child to ascertain the quality of improvement. It is to be noted that the primary site of referral, diagnosis, and treatment by the school health team occurred within the school itself. The school health team spent at least one half-day every two weeks in each of the ten elementary schools. On two half-days a week, more extensive evaluation of complex cases was held within the Outpatient Department of the University of Maryland Hospital. Here the involvement of the pediatric house staff with all of the team members in the diagnosis and recommendations regarding these difficult problems of childhood behavior and learning added the dimension of physician training to the process. This may encourage the developing child care specialist to attempt to expand the horizons of school health in the future within the community where he will be practicing. Laboratory facilities were available as well as consultations with pediatric and psychiatric supervisors. The responsibility of the team was for school health care defined in this model as a multidisciplinary approach to the behavior and learning problems of the children in the ten schools.

The method of referral was from classroom teacher to principal. The principal then discussed the case with the school health nurse who brought the child with a learning or behavior problem to the attention of the school health physician. The physician, in turn, noted all educational and nursing data and completed a thorough workup on the child at the school. After careful analysis, the school health physician then asked other members of the team for whatever assistance was felt to be required. On-site observation within the classrooms by the diagnostic and prescriptive teacher, home visiting and interviewing by the social worker, testing by the psychologist in the special rooms set aside for individual student instruction (resource

rooms), and speech and hearing evaluation by the speech clinician were all additional possibilities within the diagnostic workup. Once all the necessary professional observations have been completed, a team conference was held where the child's overall problems were analyzed and the diagnosis and plan of management which included direct instructional advice were outlined.

The management of minor physical complaints was handled by the school nurse within each elementary school either by on-site management by the nurse or physician or referral to an outside clinic or physician. A conference with the school health physician was held only when necessary regarding these minor physical problems. All complex cases of physical illness were conferenced with the school physician before referral. To assure appropriate referral in these situations, the school physician is required to have completed the necessary residency training in pediatrics or family medicine. In order to reach the program's primary goal of redefining school health along the parameters of the diagnosis and remediation of behavior and learning disorders of childhood, the school physician needs primary training and career direction which is expanded to include the emotional and educational problems of children in addition to training in acute health care. This paper will emphasize only those problems related to learning and behavior since this was the primary goal and responsibility of the School Health Team.

The behavior and learning problems seen by the team during the first year of operation were categorized as either functional or organic and were classified as being primary, secondary, or tertiary, taking into account that multiple types of problems were common. "Primary" was defined as the most immediate cause of the behavior and learning disorder. "Secondary" and "tertiary" were defined as additional pertinent diagnoses requiring concomitant or subsequent team attention to fully remediate the child's overall problem. The functional

category included emotional and social-cultural problems. Social-cultural problems included those situations in which the family or social situation were significantly involved in the child's poor school performance. Education as a low family priority, repeated absences due to family needs, and repeated change in family location and structure are examples of this category. The organic diagnoses included visual-motor perceptual problems; minimal brain dysfunction with hyperactivity; mental retardation (IQ under 65, IQ 65 to 74, IQ 75 to 84); hearing loss; auditory perceptual dysfunction; and brain damage with seizures but without hyperactivity. The primary, secondary, and tertiary diagnoses were decided upon after a complete workup and team conference on each child.

Results

During the school year (1972-1973), 153 children were seen with some clustering of referrals from Grade 1 and 2 (Table I). Of these, 1.6% of the black population (104 children) and 1.9% of the white population (49 children) were referred. One hundred and twenty-five referrals were male and 33, female. Sixty-five or 42.5% of the children referred had repeated at least one grade and, therefore, had previously been identified as having significant learning or behavior problems.

During the preceding year (1971-1972), the school nurses' log books indicated that under the category "emotional referrals" in the ten elementary schools, 90 children had been referred for behavior and learning problems. Thirty percent (27) of these received psychometric evaluation. The following year, when the team was on-site within the schools, 153 children were referred and, of these, 53.6% (82) had completed psychological testing. Except for extremely complex cases requiring multiple referrals which accounted for less than 20% of the cases, the remainder of the children were seen within their

school by the team. Here the process of team evaluation and recommendation was completed within a two week period of time with immediate feedback to teacher and principal by appropriate team member.

The distribution of the primary diagnoses and their association with previous failure and age have been noted in Table II. At this writing, 21 of the original 153 referrals had not completed the diagnostic testing and therefore will not be considered here. Emotional problems noted in 34% of the children were the most frequent primary diagnosis followed by minimal brain dysfunction with hyperactivity (24%), mental retardation (20%), and significant visual-motor perceptual problems (11%). Only 6.8% of the youngsters had social-cultural problems while a scant 0.8% had significant auditory perceptual dysfunction. The percentage of repeaters observed did not differ significantly between groups. However, when primary functional and organic diagnosis was compared with age, a significant difference in incidence was noted, with organic diagnoses occurring more frequently than functional between the 5 to 8 year group and the opposite registering ($p = \text{less than } .005$) among the 9 to 13 year old children (Table II).

As expected, the children tested had multiple problems with a high incidence of secondary and tertiary diagnoses (Table III). Thus, of 45 youngsters with a primary diagnosis of emotional problems, only 9 had no other diagnosis. In contrast to these children, 13% of the remainder had minimal brain dysfunction and hyperactivity as secondary or tertiary diagnoses, 12% had significant perceptual problems, 20% social-cultural problems, 6% speech defects, 29% specific medical problems, and 13% retardation. Of the 15% who had minimal brain dysfunction with hyperactivity as a secondary diagnosis, the majority were older children in the upper elementary school grades. It must be pointed out that among the group of the 32 youngsters who

had a primary diagnosis of minimal brain dysfunction with hyperactivity, 26 (81%) also had significant perceptual problems as a secondary diagnosis. This high incidence of secondary perceptual problems among the minimal brain dysfunction-hyperactive group is a pertinent and serious consideration in the management of the minimal brain dysfunction-hyperactive child to be discussed below. Uncovering this large number of secondary and tertiary diagnoses reinforces the concept that those children with learning disorders frequently suffer from multiple problems.

The medical history of the children studied revealed that 34 (25.7%) of 132 children seen had enuresis at the time of the initial evaluation. Enuresis was not associated with any specific diagnostic category. Strabismus, which is often stressed in children with minimal brain dysfunction, was found in only seven children or 5.3% of this total child population.

Employing the criteria of Connor⁶ and Eisenberg⁷, 49 (37%) of the 132 children completely worked-up were begun on medication such as Dexedrine, Mellaril, Dilantin, or Ritalin for hyperkinetic behavior (Table IV). Dilantin was prescribed in addition to the psychoactive drug on one child with overt seizure diathesis and hyperactivity. These children were noted to have primary diagnoses including minimal brain dysfunction with hyperactivity (32), retardation (8), emotional problems (7), perceptual problems (2) and socio-cultural problems (1). When judged by clinician, parent, and/or teacher response to regularly recorded verbal inquiry relative to the lessening or elimination of their hyperkinetic behavior, 45 of the 49 children (91.8%) receiving medication were felt to have responded positively. These children, as well as the remaining 83 children, received additional remedial interventions including social work counselling for family, parent, or child; speech therapy; specific instructional techniques related to the diagnosed problem;

and psychotherapy, singly or in groups, among others. Each child had his own plan of management which involved the team and/or outside agencies.

Discussion

The goals of the program in redefining school health were twofold: (1) to create a coordinated, educational interdisciplinary school health model which provided diagnoses, referral or on-site therapy, and the prescription of a definitive program for children with learning and behavior disorders; and (2) to deliver this program in the primary school as on-site health care based upon educational and emotional disabilities, with the acute and chronic physical problems referred to outside medical agencies after consultation between the school nurse and school health physician. To accomplish these goals, a school health team was developed. The task of the school health physician was to orient elementary school health toward learning and behavior, while also seeing that physical illness, after identification by the public health nurse, would be treated through private offices or University or community health centers.

The preponderance of males with learning disorders was reaffirmed in this study with an almost 4:1 male to female ratio. The fact that 42.5% of the initial referrals were children who had previously failed was further proof that those children first referred to a new team of on-site professionals are those already identified as "problems" by their overt inability to succeed within their school environment.

The number of children referred for learning and behavior problems during the year of the team's operation in the school increased by 70% from the previous year's program. This suggests that the presence of the team within the school setting provoked greater teacher-child identification. The presence

of the team also accounted for more extensive workups of individual children as measured by completed psychological testing.

As previously noted, the analysis of the primary, secondary, and tertiary diagnoses of this population confirmed that children with learning and emotional disorders have a multiplicity of problems.⁸ As noted, a high percentage of children (81%) with minimal brain dysfunction and hyperactivity also had a diagnosed perceptual handicap. Therefore, in addition to the prescription of medication for the hyperactivity, serious consideration for diagnosis and treatment for possible perceptual problems interfering with learning appears to be indicated in the educational and emotional workup and management of these children.

In addition, as mentioned earlier, there was a statistically significant difference between the types of referrals to the school health team between children aged 5 to 8 and those in a 9 to 13 year old age group. There was a 3 to 1 preponderance of organic versus functional diagnoses in the earlier age group. During the first two grades, the children with significant retardation and minimal brain dysfunction with overt hyperactivity, as well as those with severe organic perceptual handicaps, were more easily identifiable. Major sensory losses, such as visual and hearing impairments, were commonly diagnosed in the pre-school years. The increased percentage of functional disorders presenting during the later school years may well represent children who began to manifest emotional and social maladjustment as a result of underlying organic learning disorders which had not been previously diagnosed. Though the socio-cultural problems in this study were few, it should be noted that they occurred at a later age. This raises the question of the impact of the "cumulative" effect of social and educational failure in these children.

The large percentage (37%) of children initially referred who were placed on medication, as noted, confirm the reports of Stewart⁹ and Huessey¹⁰ that hyperkinesis is, by no means, an unusual syndrome among the elementary school population. The school health team noted that contrary to the belief that puberty diminishes both the need for and response of hyperkinetic young adults, a number of the children in the upper grades with both hyperactivity and emotional problems were responsive to prescribed medications. Follow-up studies on hyperactive youngsters in a recent article by Stewart (et. al.) suggests that the dysactive, antisocial behavior continuing in certain adolescents observed during their teen years was still quite significant and may still require treatment.¹¹

The high response to medication noted by parent and teacher verbal interviews during the initial year of the team operation (positive results in 45 of 49 youngsters on medication or 91.8%) could either be the result of one or both of the following: a placebo effect, i.e. a change in attitudes of teacher-parent-child communication or an actual positive medication response. However, whatever the actual cause, the percentage response and parent-teacher-child satisfaction was impressive.

Traditionally, the school nurse functioned as practitioner referring the learning and behavior problems to the school physician after eliminating severe sensory problems which were referred elsewhere or obvious social problems which could be handled by the nurse and the school administration. Often, the school physician, after assessing the child, was forced to refer the child to the nearest Pediatric, Neurology, or Child Psychiatry Outpatient Department for more extensive evaluation. Obviously, the most effective way to avoid delays and repetition of testing and examination is for the physician and his professional colleagues, already delivering child care in the schools,

to be specifically trained and qualified to handle the learning and behavior problems of the children there. However, it must be remembered that the diagnostic workup of a learning and behavior problem is a multidisciplinary project for which the physician alone, no matter how extensive his training, has neither the expertise nor the time. There are numerous other professionals with whom he must work to fully understand the scope of the individual child's problems and to be able to completely remediate all emotional and educational deficiencies.

Thus, the training of this new school health professional must be carried out within the "team" concept, utilizing the ancillary assistance of the pediatrician specially trained in behavioral/learning problems, child psychiatrist, psychologist, educator, social worker, and speech and hearing clinician. The school health pediatrician must learn the language of the other professionals and be able to participate in the coordination of all professional information into a realistic, multi-faceted diagnosis and plan of management which includes definitive instructional advice on each specific child. Each facet of this school health prescription then becomes the designated responsibility of one or more members of the team. Outside consultations may be utilized but the decision to use such consultations and the assessment of the results of outside agency intervention should continue to be the responsibility of the original school health team working within the school setting.

Summary

This paper has described the composition and function of a special school health team operating within 10 elementary schools in the City of Baltimore. The characteristics of the children who were referred to such a "team" during the first year of its operation were noted. The team operation resulted in an

increase in number of referrals, as well as a greater number of completed psychological evaluations. The response to medication, where indicated, was impressive although the actual cause for this response cannot be clearly defined.

Finally, one role and function of a new pediatric specialist - the school health physician - and the integration of this new professional into a multidisciplinary school health team operation has been outlined.

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TABLE I

Number of Referrals by Grade (1972-73)

GRADE:	Kg	1	2	3	4	5	6	Special Education	Total
Total of 10 Schools	15	36	32	24	9	13	14	10	153
% Grade Population	1.4%	2.5%	2.3%	1.8%	0.7%	1.1%	1.4%	3.3%	1.7%
% Referral Population	9.8%	23.5%	20.9%	15.7%	5.9%	8.5%	9.2%	6.5%	

TABLE II

Incidence of Primary Diagnoses, Number of Grade Repeaters and Age in 132 Children (1972-73)

	Primary Diagnosis		Repeaters		AGE	
	No.	(%)	No.	(%)	5-8 yrs. No.	9-13 yrs. No.
<u>Functional</u>						
Emotional	45	(34.1)	17	(37.8)	19	35
Social-Cultural	9	(6.8)	3	(33.3)		
<u>Organic</u>						
Minimal Brain Dysfunction with Hyperactivity	32	(24.2)	13	(40.6)		
Retardation	26	(19.7)	12	(46.2)		
Visual Motor Perception	14	(10.6)	5	(35.7)	55	23
Hearing Loss	2	(1.5)	1	(50.0)		
Brain Damage	3	(2.3)				
Auditory Perception	1	(0.8)				
	132		51	(38.6)		

$\chi^2 = 16.17$
 $P = < 0.005$

TABLE III

Total of
Secondary and Tertiary Diagnoses in %

Primary Diagnosis	Emotional Problems	Minimal Brain Dysfunction	Secondary and Tertiary Diagnoses in %				Specific Medical Retardation	Neurologically Impaired
			Perceptual	Social	Hearing	Speech		
Emotional Problems (45)	--	13	12	20	2	6	13	2
Minimal Brain Dysfunction (32)	6	--	81	15	9	25	0	0
Visual Perceptual (14)	21	21	--	14	7	14	28	0
Social Problems (9)	0	0	20	--	11	0	22	0
Hearing Loss (2)	0	0	50	50	--	0	0	0
Retardation (26)	4	0	34	14	0	30	--	26
Brain Damage (3)	0	0	0	0	0	0	100	--
Auditory Perceptual (1)	0	0	--	0	0	0	100	0

TABLE IV

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MEDICATION

<u>1° Diagnosis</u>	<u>No. Given Trial</u>	<u>No. Responding</u>
Emotional Problems (45)	7	6
Perceptual Problems (14)	2	1
Social-Cultural (9)	1	1
Minimal Brain Dysfunction with Hyperactivity (32)	31	31
Retardation (26)	8	6
TOTAL	49	45

43 children were given ritalin; 2 children, dexedrine; 3 children, mellaril; and 2 children, dilantin. One child was on both ritalin and dilantin.

NOTE: Of the four children who did not respond to medication, one was on dilantin alone and three on ritalin.