Impact of Resident Participation in a Multidisciplinary Diabetes Team

DEBORAH L. GRAY, RN, MSN, CDE
CARL D. LANGEFELD, MS
MICHAEL P. GOLDEN, MD
DONALD P. ORR, MD

OBJECTIVE — To determine the impact of participation in a multidisciplinary diabetes team on pediatric residents' perceptions of team members' roles.

RESEARCH DESIGN AND METHODS — Pediatric residents were assigned to a traditional diabetes clinical rotation (n = 34) or to an ambulatory multidisciplinary diabetes team within their continuity clinic (n = 21). The residents and a small sample of practicing pediatricians (n = 46) completed a Likert-type instrument at the completion of the 18-mo study.

RESULTS — Multidisciplinary diabetes team residents were significantly more positive about the roles for endocrinological evaluation in monitoring compliance, for the nurse educator/certified diabetes educator in assisting with sick-day management and school behavioral problems, and for the dietitian in helping with cholesterol problems. They were significantly more like practicing pediatricians in their perceptions of pediatric roles in teaching sick-day management, implementing weight reduction, assisting with conflict resolution about diabetes, screening for microvascular complications, and developing behavioral strategies for metabolic control than residents in the traditional rotation. The groups did not differ in their beliefs about patient empowerment.

CONCLUSIONS — Multidisciplinary diabetes team participation may be useful in modifying specific role perceptions of pediatric residents about diabetes care. It does not appear to alter perceptions favoring greater patient empowerment.

FROM THE SECTION OF ADOLESCENT MEDICINE, DEPARTMENT OF PEDIATRICS, AND THE DIVISION OF BIOSTATISTICS, DEPARTMENT OF MEDICINE, INDIANA UNIVERSITY SCHOOL OF MEDICINE, INDIANAPOLIS, INDIANA; AND THE DEPARTMENT OF PSYCHIATRY, UNIVERSITY OF WASHINGTON SCHOOL OF MEDICINE, SEATTLE, WASHINGTON.

ADDRESS CORRESPONDENCE AND REPRINT REQUESTS TO DEBORAH L. GRAY, RN, MSN, CDE, SECTION OF ADOLESCENT MEDICINE, ROOM 5809, INDIANA UNIVERSITY MEDICAL CENTER, 702 BARNHILL DRIVE, INDIANAPOLIS, IN 46202–5225.

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IDDM, INSULIN-DEPENDENT DIABETES MELLITUS; CDE, CERTIFIED DIABETES EDUCATOR; MDT, MULTIDISCIPLINARY DIABETES TEAM; DKA, DIABETIC KETOACIDOSIS; ANOVA, ANALYSIS OF VARIANCE.

The health-care needs of children and adolescents with IDDM are complex and increasingly met with the use of multidisciplinary health-care teams (1). Although pediatricians care for a large proportion of children and adolescents with IDDM (2), many feel unprepared to care for the chronically ill. Most have not received formal training in multidisciplinary care (3). Because physician attitudes often predict their practices, it is disturbing to find residents perceive diabetes and diabetic patients more negatively than practicing pediatricians (4). Therefore, altering physicians' perceptions of diabetes during training may be important (5). This study was designed to test the effects of residents' MDT participation on their perceptions of team care.

RESEARCH DESIGN AND METHODS

— All residents in a large pediatric residency program received didactic instruction on IDDM, which included pathophysiology, treatment of DKA, and long-term management; and they completed a 1-mo rotation on a pediatric diabetes/endocrine service. During this period, residents participated as a member of the diabetes service in caring for hospitalized and ambulatory IDDM patients. Of the residents, 34 participated in this component only and were referred to as the traditional group; 21 residents received additional education and participated as a member of an MDT within their continuity clinic, they were referred to as the experimental group. Residents in this group saw patients in their regular continuity clinics with a general pediatric preceptor and members of the diabetes team—a nurse practitioner/certified diabetes educator, a dietitian, and a social worker. A pediatric diabetologist was available for consultation. Residents were assiged to either group based on the day of the week their continuity clinic met.

At the end of 18 mo, residents completed a 17-item, 5-point Likert-

Table 1— *Appropriateness of task for respondent*

Task	Respondent	Mean ± SD (Median)	*P* value
Teach sick-day management	Pediatrician	1.3 ± 0.5 (1.0)	0.04
	Resident (Traditional)	1.6 ± 0.7 (2.0)	
	Resident (Experimental)	1.3 ± 0.5 (1.0)	
Weight-reduction program	Pediatrician	1.2 ± 0.4 (1.0)	0.04
	Resident (Traditional)	1.5 ± 0.7 (1.0)	
	Resident (Experimental)	1.3 ± 0.5 (1.0)	
Conflict Resolution	Pediatrician	1.4 ± 0.5 (1.0)	0.04
	Resident (Traditional)	1.8 ± 0.8 (2.0)	
	Resident (Experimental)	1.5 ± 0.6 (1.0)	
Screen for microvascular complications	Pediatrician	1.7 ± 0.8 (2.0)	0.03
	Resident (Traditional)	1.5 ± 1.0 (1.0)	
	Resident (Experimental)	1.2 ± 0.4 (1.0)	
Behavioral strategies for metabolic control	Pediatrician	1.5 ± 0.6 (1.0)	0.02
	Resident (Traditional)	1.8 ± 0.7 (2.0)	
	Resident (Experimental)	1.5 ± 0.6 (1.0)	

Respondents' scores were based on the following scale: 1 = highly appropriate, 5 = highly inappropriate.

type instrument, rating the appropriateness of specific diabetes-related tasks for each team member (diabetologist/endocrinologist, pediatrician, nurse-educator, dietitian, social worker, and patient/family). Tasks included adjusting insulin dose, teaching sick-day management, managing insulin during illness, teaching management for diet and exercise, implementing weight-reduction programs, modifying diet for cholesterol, helping with conflict resolution related to diabetes, helping the patient and family determine level of self management, identifying community resources, assisting schools in evaluating behavior, evaluating monitoring techniques, evaluating compliance, screening for microvascular complications, evaluating family relationships, developing behavioral strategies for improving metabolic control, and telephone contact.

For comparison, the questionnaire was sent to 151 pediatricians in Indiana, identified through the American Academy of Pediatrics. Nonparametric one-way ANOVA (Kruskal Wallis) tested for differences among the three groups (6).

RESULTS — Twenty-one (100%) residents participating in MDT, 34 (100%) residents receiving traditional training, and 46 (30.5%) practicing pediatricians completed questionnaires. Significant differences were observed among the three groups in their perceptions of their roles in the following tasks: developing behavioral strategies to improve control ($P = 0.02$), teaching sick-day management ($P = 0.03$), recommending weight reduction ($P = 0.02$), helping families resolve conflict about diabetes ($P = 0.04$), and screening for microvascular complications ($P = 0.02$). MDT residents were closer to pediatricians in their level of confidence in these areas than to residents in traditional training (Table 1).

The groups also differed in the perceived appropriateness of certain tasks for each team member (Table 2). Residents participating in the MDT group believed specific team members appropriately perform the following tasks: endocrinologists evaluate compliance ($P = 0.03$), diabetes nurse educators teach sick-day management ($P = 0.001$) and help school personnel evaluate behaviors ($P = 0.05$), and dietitians modify dietary cholesterol intake ($P = 0.02$). MDT residents, however, were no more likely than the other two groups to view routine insulin-dose adjustment ($P = 0.95$) or insulin adjustment during illness ($P = 0.96$) as an appropriate task for patients/families (despite a strong emphasis on patient empowerment in our program).

In addition, all three groups rated some tasks—deciding the level of self care, helping schools evaluate behavior, and developing behavioral strategies to improve control—as much less appropriate for social workers than recommended in the training program. All three groups underestimated the dietitian's role in recommending a weight-reduction program.

CONCLUSIONS — Our data suggest training in MDT alters some role perceptions about diabetes care. Residents participating in the MDT were more confident in several important areas: teaching sick-day management, recommending weight reduction, assisting with conflict resolution, recognizing microvascular complications, and suggesting behavioral strategies for metabolic control. The MDT residents' level of confidence was closer to more experienced pediatricians. The enhanced confidence about diabetes care may be justified, because participation in MDT improves care (7). We cannot, however, exclude the possibility that increased confidence is attributable to greater exposure to IDDM (8).

We also found differences in perceptions of the roles of team members for specific activities. Participants in MDT were more positive about the roles for the endocrinologist, social worker, nurse educator, and dietitian. This result is encouraging, because these duties are quite difficult for pediatricians to manage alone.

After training, residents were positive about the nurse educator's role in assisting patients and families with insulin adjustment, dietary and fluid intake, and in assessing the need for further

Table 2— *Appropriateness of task for each team member*

Team member	Task	Respondent	Mean ± SD (Median)	P value
Endocrinologist	Evaluate compliance	Pediatrician	1.4 ± 0.7 (1.0)	0.03
		Resident (Traditional)	1.3 ± 0.8 (1.0)	
		Resident (Experimental)	1.0 ± 0.0 (1.0)	
Social worker	Evaluate family relationships	Pediatrician	1.2 ± 0.4 (1.0)	0.06
		Resident (Traditional)	1.4 ± 1.2 (1.0)	
		Resident (Experimental)	1.0 ± 0.0 (1.0)	
Diabetes nurse educator	Sick-day management	Pediatrician	1.6 ± 0.6 (2.0)	0.001
		Resident (Traditional)	1.4 ± 0.8 (1.0)	
		Resident (Experimental)	1.1 ± 0.4 (1.0)	
	Help school evaluate behavior	Pediatrician	1.6 ± 0.6 (2.0)	0.05
		Resident (Traditional)	1.8 ± 0.8 (2.0)	
		Resident (Experimental)	1.4 ± 1.0 (1.0)	
Dietitian	Dietary modification cholesterol	Pediatrician	1.7 ± 1.0 (1.0)	0.02)
		Resident (Traditional)	1.3 ± 0.7 (1.0)	
		Resident (Experimental)	1.1 ± 0.4 (1.0)	

Respondents' scores were based on the following scale; 1 = highly appropriate, 5 = highly inappropriate.

evaluation during acute illness. They remained uncertain about the role of the social worker in dealing with complex social issues—assessing the ability for self care, evaluating school behavior, and developing behavioral strategies to improve metabolic control. Further research should identify techniques to alter these perceptions, because our experience suggests modifying psychosocial factors is important in improving control (9).

We made no measurable impact on residents' beliefs about the appropriateness of patient/family self adjustment of insulin or management of insulin during illness. Empowerment of patients and families through education and guided self care, (including insulin adjustment within well-prescribed guidelines), is a component of our program (2,9). Empowerment is a relatively recent concept in patient care and is not taught in more traditional pediatric training programs (10). The reason for the failure to endorse patient empowerment is unclear. Residents' inexperience may create sufficient anxiety that they are unable to relinquish this degree of control. Whether more positive perceptions of MDTs influence physicians' management of patients remains a topic for future research.

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