

# Training Future Primary Care Pediatricians to Serve Handicapped Children and Their Families

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A national program designed to promote the establishment of effective, mandatory, and comprehensive training at the residency level to prepare primary care pediatricians to serve handicapped children and their families is described. A structured curriculum designed for a clinical rotation in developmental pediatrics is presented in addition to a summary of the results of subjective and objective evaluations of the program. Evaluations clearly suggested the value of the program for both demonstration and replication sites. Follow-up of former residents new in pediatric practice further supported the effectiveness of a rotation in developmental pediatrics based on a structured curriculum.

Pediatricians play vital roles in the identification of handicapped children and as collaborators in the complex process of providing early intervention services (Fischler & Tancer, 1984; Howard, 1982). We are not referring here only to individuals specially trained in developmental pediatrics, that subspecialty of pediatrics devoted to children with chronic, central nervous system handicapping conditions focusing primarily on those with developmental disabilities (Thompson & O'Quinn, 1979). These experts in developmental pediatrics undergo extensive fellowship training following their pediatric residency and are often based in major medical centers providing tertiary care, conducting research, and training residents and related staff. Unfortunately, the

demand for developmentally trained pediatric subspecialists exceeds the supply, and numerous faculty positions in pediatric training programs remain vacant (Hornstein, 1985).

It is, however, the primary care pediatrician, entering practice following three years of residency training and without extensive specialized expertise in developmental problems, to whom important responsibilities in this area often fall. These include screening and identification of developmental problems, making appropriate referrals to medical and nonmedical disciplines, providing and coordinating medical care, communicating regularly with and providing counseling to families, and ensuring that children and families are aware of needed community resources (Dworkin, 1983). Although primary care pediatricians may not be involved in clinical problem solving for complex cases, their roles in ongoing care and management are both prominent and essential. Unfortunately, both parents and professionals have been highly critical of primary care pediatricians, arguing that most of these important responsibilities have been carried out with questionable quality and, of equal importance, that there exists a lack of sensitivity to the needs of handicapped children and their families (e.g., Gorham, Des Jardins, Page, Pettis, & Schreiber, 1975; Guralnick, Richardson, & Kutner, 1980; Pueschel & Murphy, 1976).

Although the validity of some of the criticisms may be questioned, an assessment of available training opportunities during the 3-year pediatric residency period focusing on handicapped children and their families found that such training programs were generally inadequate, suggesting a possible basis for the problems experienced by pediatricians when they enter primary care. Specifically, a comprehensive assessment of pediatric residency training programs across the country revealed that very few programs provided for systematic clinical involvement with handicapped children or even attempted to organize and communicate the knowledge base and clinical competencies that a primary care pediatrician would need in order to serve handicapped children and their families effectively (Guralnick & Richardson, 1980). To be sure, many barriers to improved training were apparent. A survey by Guralnick, Richardson, and Heiser (1982) indicated that limited resources, lack of trained faculty, minimal resident interest, competition for resident time in an already demanding schedule, and the absence of a well-defined field of study and corresponding curriculum were all major barriers. Institutional complacency and the perceived "soft" scientific nature of developmental pediatrics, especially in relation to early intervention (Guralnick & Bennett, in press), made it even more difficult for those

interested in improving and expanding training in areas related to handicapped children at the residency level.

Despite these problems, a number of optimistic trends can be noted. Perhaps the most important is the fact that primary care pediatricians themselves are recognizing the limitations in their training in areas related to child development, including chronic handicapping conditions (Dworkin, Shonkoff, Leviton, & Levine, 1979; The Task Force on Pediatric Education, 1978). Coupled with the changing nature of pediatric practice patterns (Richmond, 1975), there now appears to be a willingness to modify training at the medical school, residency, and continuing education levels (Richardson & Guralnick, 1983).

This article discusses our national-in-scope program designed to promote improved residency training in relation to handicapped children and their families. Supported as part of the Handicapped Children's Early Education Program over the past few years, the long-term goal of our efforts has been to ensure that pediatric residents in all accredited programs across the country receive effective and comprehensive training in developmental pediatrics. There are many and varied aspects of this mission, including organizational, political, and research and evaluation issues. Such a "systems" approach has been described elsewhere (Guralnick, Heiser, Bennett, & Richardson, in press). The following discussion, however, will be limited to a brief description of the curriculum developed by a national task force of experts and a summary of the evaluation components of the project. These two aspects of our project are emphasized because the absence of a generally agreed-upon body of knowledge, set of clinical competencies, and attitudes in relation to developmental problems appeared to be major barriers to change. In addition, given that the audience we were interested in influencing was, at best, skeptical, it was essential not only to develop an appropriate rationale for the value and importance of training in developmental pediatrics but also to gather evidence to support the quality and impact of our program.

## **Description of the Curriculum in Developmental Pediatrics**

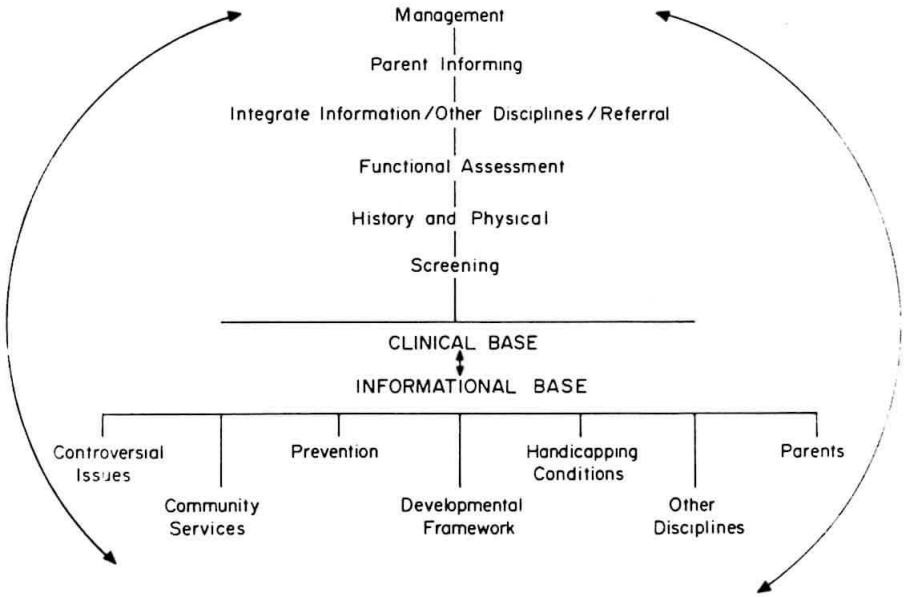
With the support of a national task force of experts in pediatric education and developmental pediatrics, as well as members of key pediatric boards and committees, a comprehensive curriculum in

developmental pediatrics was developed (Bennett, Heiser, Richardson, & Guralnick, in press). The curriculum was composed of 10 similarly organized units consisting of broad goals, specific educational objectives, and matched learning activities as well as specific content outlines for didactic presentations, model clinical protocols, suggested clinical experiences, and core and supplementary readings. In essence the curriculum was designed to be flexible to enable use by a range of diverse training programs while maintaining the integrity of the curriculum itself. This was accomplished through the use of a series of core cases and by providing supplementary educational materials for programs with limited patient flow for clinical work or for those with limited resources. The 10 units were as follows: (1) basic principles of child development and screening, an introductory review unit; (2) knowledge of handicapping conditions (developmental disabilities); (3) aspects of prevention; (4) comprehensive pediatric developmental diagnosis and assessment; (5) interdisciplinary process and team functioning; (6) families; (7) management of developmental disabilities; (8) attitudes toward handicapping conditions; (9) community services and resources; and (10) controversial research issues. Although the curriculum consisted primarily of clinical competencies, the clinical and informational bases were well integrated throughout the curriculum, in part through the use of the core cases. Figure 1 illustrates the interrelationships among the curriculum components.

## Curriculum Evaluation

During the developmental phases of the curriculum, a wide variety of process analyses were carried out. Pediatric training directors and other prominent pediatric educators were asked to evaluate different dimensions of the curriculum, emphasizing the feasibility of implementing such a structured rotation within a residency program. Moreover, each of the curriculum units was subjected to a series of evaluation-revision cycles at one of seven demonstration sites. Following these initial tests, the curriculum was disseminated widely and more formal evaluations were initiated.

The most current evaluations were based on data obtained from approximately 160 pediatric residents participating in 15 different



**Figure 1.** Interrelationship of curriculum components. *Note.* From "Teaching Developmental Pediatrics to Pediatrics Residents: Effectiveness of a Structured Curriculum," by F. C. Bennett, M. J. Guralnick, H. B. Richardson, & K. E. Heiser, 1984, *Pediatrics*, 74, p. 517. Copyright 1984 by Pediatrics. Reproduced by permission of Pediatrics.

training sites across the country (Bennett, Guralnick, Richardson, & Heiser, 1984; Guralnick, Bennett, Heiser, Richardson, & Shibley, under review). Although data were analyzed separately for the original demonstration sites and for those sites which were later recruited into the network but which had not participated in the curriculum development process (replication sites), the differences between the two types of programs were minor. Accordingly, the evaluation summary presented below is based on data combined from demonstration and replication programs. Moreover, it is important to note that the finding that demonstration and replication sites produced equivalent results allows us to be confident that program effectiveness was not primarily the result of the enthusiasm, commitment, or characteristics unique to the original demonstration sites, an issue of considerable significance for a program designed for national dissemination.

## Subjective Evaluation

Subjective ratings by pediatric residents and by pediatric faculty addressed a number of important dimensions. Upon completion of the rotation based on the curriculum, residents were asked to rate their competence in carrying out a variety of clinical procedures for children with suspected or confirmed handicapping conditions. A 7-point scale ranging from 1 (extremely poor) to 7 (extremely good) was employed. Clinical processes paralleled the curriculum (see Figure 1) and consisted of: (a) developmental screening, (b) developmental history and etiologic formulation, (c) physical and neurological examination, (d) vision and hearing screening, (e) motor, language, and socioemotional assessments, (f) integration and synthesis of findings, (g) working with other professionals (interdisciplinary), (h) communicating with parents, (i) management, (j) utilizing community services, and (k) attitudes/clinical approach. Residents were also asked to estimate the proportion of their competence that could be attributed directly to their involvement in the developmental pediatrics rotation itself. Pediatric faculty having primary responsibility for precepting were asked to evaluate each resident by completing a similar clinical skills checklist.

The results indicated that residents rated their clinical skills as above average (overall mean=5.14) and that most of their competence could be attributed directly to the rotation (overall mean=53.6%). Competence attributed to the rotation in interdisciplinary aspects and integrating findings were the two areas rated highest by residents. As might be expected, the physical and neurological examination and hearing and vision screening were the areas that received the lowest ratings, due primarily to similar training occurring in other rotations. Moreover, residents perceived their skills in long-term management and accessing community resources as being least well developed. This is understandable given the relatively short duration of the rotation and the fact that only limited opportunities for community interaction could be planned. Ensuring that a variety of handicapped children are included in Continuity Clinic, in which residents assume patient responsibility over the 3-year residency period, is one way to improve skills in these two areas. Pediatric faculty ratings corresponded closely to resident ratings. Finally, a separate subjective rating of factual knowledge of the classification, incidence, etiology, presentation, natural history, and associated problems of the major developmental disorders on a similar scale revealed a slightly lower rating (mean=4.63) than for clinical skills but a higher percentage score attributed to the rotation (nearly 60%).

A second self-report questionnaire evaluated the extent to which residents considered the rotation to be well organized and of significance to their anticipated pediatric careers. Once again, favorable ratings were obtained. The organization score (mean=5.01) was especially important given the diverse nature of the programs involved. Similarly, the fact that the residents rated the rotation as of potential value to their anticipated pediatric careers (mean=5.88) suggests that the rotation may have been successful in improving residents' recognition of the relevance of developmental pediatrics, a realization which usually does not occur until well into pediatric practice.

## Objective Evaluation

More objective assessments carried out in conjunction with appropriate experimental designs were essential to properly evaluate the effectiveness of the rotation based on the structured curriculum. Accordingly, in order to evaluate the factual knowledge gained by residents as well as to assess their clinical decision-making skills, a series of Evaluation Case Study questions were developed focusing on children with different handicapping conditions. These four cases, representing a variety of handicapping conditions, were as follows: (1) a 3-year-old with Down syndrome, (2) a 2-year-old with the spastic diplegia type of cerebral palsy, (3) a 7-year-old with school learning and attending problems, and (4) a 3-year-old born 10 weeks premature with significant language delay. A sequential format presentation was employed; residents were given additional clinical information as they proceeded through each main question.

These Evaluation Case Study questions were used with an experimental design that was adapted to the scheduling constraints found in residency programs but that enabled residents to be assigned randomly to experimental (post-rotation) and control (pre-rotation) groups. The details of this design are described elsewhere (Richardson & Guralnick, 1978). However, it is important to note that the effect of this technique is to randomize all possible confounding variables between control and experimental groups, including prior experiences of residents on related rotations and self-selection factors.

The results of this objective assessment were clear-cut (Bennett et al., 1984; Guralnick et al., under review). Residents in the experimental group (those that had just completed the rotation) scored significantly higher on each of the four Evaluation Case Study questions than control

group residents (those who had not yet, but were about to, participate in the rotation). In fact, a nearly 40-point overall difference separated the two groups.

Accordingly, results from both subjective and objective analyses and across demonstration and replication sites suggest that a rotation in developmental pediatrics based on a structured curriculum can be effective. Residents who completed the rotation felt that their participation was essential for acquiring the skills and knowledge needed to serve handicapped children and their families in pediatric practice and that the area of developmental pediatrics was important to their anticipated pediatric career. Residents also observed that their rotations were generally well organized, despite the variability in qualified faculty, clinical opportunities, and related resources available at the sites. Moreover, significant increases in the decision-making skills and associated factual knowledge of residents who participated in the program suggested that the rotation can improve the quality of care for handicapped children and their families.

### **Follow-up in Pediatric Practice**

Despite this positive evidence for the effectiveness of our program, the ultimate value of rotation in developmental pediatrics can be assessed only in terms of its impact on the quality and quantity of services that are provided in primary care settings. Although it was not possible to maintain separate control and experimental groups, as all control group residents were scheduled for the rotation, sufficient time has elapsed for residents who participated in the initial evaluation to have entered either primary care or one of the many subspecialty fellowship programs for additional training. Approximately 100 residents recently became available for follow-up and 61 residents have returned a follow-up questionnaire (Heiser, Guralnick, Bennett, & Richardson, in preparation). Slightly over half of those residents are currently in pediatric practice providing primary care. The remainder of this section focuses on the responses of these primary care pediatricians to the follow-up questionnaire.

To determine the value and significance former residents placed on the rotation in developmental pediatrics, they were asked whether the rotation they had participated in should be mandatory or elective. All but one person stated that it should be mandatory, often citing professional and ethical obligations to provide quality services to



handicapped children and their families. Residents also perceived that the pediatric rotation continued to be relevant to their pediatric practice (mean=3.71 on scale ranging from 1 [not relevant at all] to 5 [essential]). Former residents were also quite confident of their ability to manage handicapped children in a primary care setting, a vital issue for families of handicapped children wishing to receive generic services (mean=3.77) on a scale with the following anchors: 1—unwilling to serve handicapped children in my practice; 3—manage only children with minor handicaps; 5—able to manage all primary care issues for handicapped children). Former residents also indicated that, as a result of the developmental pediatrics rotation, they were very effective in identifying handicapped children. As noted earlier, the ability of pediatric practitioners to properly identify children with developmental problems has been a major concern. Finally, to obtain information about the quantity and type of services provided by former residents, each was asked to identify services currently available to handicapped children and their families in their practice. Specific questions focused on the clinical skills emphasized in the curriculum. Overall, 90% of the former residents indicated that they offered comprehensive history, physical, and neurological examinations, functional assessments of motor, language, and socioemotional development; referral to community agencies, and primary care and medical management for handicapped children. Nearly two-thirds of the respondents indicated that they offered the full range of diagnostic and ongoing management and follow-up services.

In summary, practicing primary care pediatricians who had participated in a developmental pediatrics rotation based on our curriculum indicated both a willingness and a sense of professional obligation to serve handicapped children and their families. Nearly all were willing to provide basic diagnostic and follow-up medical services, and a large proportion also were willing to provide a full range of comprehensive services. An assessment as to whether the rotation actually altered parent and professional satisfaction or improved the quality of services, must await other more elaborate approaches to follow-up. However, the available evidence suggests that such positive effects may well occur.

## Conclusions

Over 40 pediatric training programs across the country are currently using the curriculum to develop or strengthen their rotation in

developmental pediatrics. The structured, detailed nature of the curriculum and the availability of data supporting the effectiveness of the training program have been extremely helpful in convincing curriculum committees at individual sites to modify their programs and in gaining the attention of key pediatric administrators. But, of course, institutional change occurs slowly (Weinberger & Oski, 1984) and persistent efforts are needed to achieve our long-term goal of a mandatory rotation in developmental pediatrics in all accredited pediatric residency training programs.

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