Effect of a Clinic-Based Referral System to Head Start
A Randomized Controlled Trial

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The integration of community resources with health care delivery is an important component of quality medical care.1,2 Although much has been written about referral patterns between primary care physicians and specialists,3,4 little is known about how primary care clinicians integrate their services with those of other community-based organizations. For children, one important evidence-based community resource is high-quality preschool. Early childhood development programs produce sustained cognitive, social, and educational benefits for low-income children.5-10 In the United States, the largest of these programs is Head Start. Any family at or below the federal poverty level is eligible to enroll its 3- to 4-year-old children in Head Start, and its 0- to 3-year-old children in Early Head Start. Social and educational benefits have been observed among Head Start graduates11; early results of a randomized controlled trial of Early Head Start supports its effectiveness across a range of outcomes.12

In 2002, the Centers for Disease Control and Prevention recommended publicly funded development programs for impoverished preschool children and suggested the promotion of such programs as part of well-child care.13 A subsequent study, however, showed that few pediatricians assist families with Head Start enrollment,14 a finding that prompted experts in the field to call for better, more systematic connections between clinicians and providers of early childhood services.15 We therefore un-

Context Early childhood development programs such as Head Start have proven benefits for impoverished children. However, few physicians assist families with enrollment.

Objective To test if a primary care–based intervention is efficacious in increasing Head Start attendance.

Design, Setting, and Participants Randomized controlled trial of 246 Head Start-eligible children aged 0 through 4 years recruited in spring 2003 from 4 health clinics in Seattle, Wash.

Interventions List of Head Start telephone contacts provided to families of all children and, for those in the intervention group, a computer-generated packet containing a physician referral letter (and a physical examination form and immunization record, if available) mailed directly to Head Start by study personnel.

Main Outcome Measure Head Start attendance by January 2004.

Results The 123 children analyzed in each study group were similar at baseline. Overall, 72 children (29%) were successfully connected with Head Start (ie, actively attending or on a waiting list) by January 2004. Among the intervention group, 50 children (41%) were successfully connected with Head Start, contrasted with 22 (18%) in the control group (adjusted difference, 17%; 95% confidence interval [CI], 8%-27%). Among the intervention group, 31 children (25%) were actively attending Head Start, contrasted with 14 (11%) in the control group (adjusted difference, 12%; 95% CI, 3%-21%). Only 2 clinics contributed children to Head Start waiting lists. Among children from these clinics, 19 of 87 (22%) in the intervention group got onto a Head Start waiting list, vs 8 of 94 (9%) in the control group (adjusted difference, 13%; 95% CI, 5%-21%). To get 1 child either into Head Start or onto a waiting list, we needed to refer 4 children.

Conclusion Facilitating an initial connection to Head Start on families’ behalf substantially increased Head Start attendance.

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dertook a randomized controlled trial of a clinic-based referral system to Head Start.

**METHODS**

**Participants**

Clinicians, office staff, and research assistants at 4 clinics in Seattle, Wash, recruited a convenience sample of children aged 0 through 4 years to participate in the study. Patients’ siblings and children present in clinic for reasons other than medical care (eg, dental care, social work consultation) were also eligible. Children were excluded if they were in obvious distress, previously enrolled in Head Start, unaccompanied by a primary caregiver, or if their families were unable to provide any contact information. Only children eligible for Head Start were included; eligibility was determined by a computerized screening instrument (available from the authors on request) that considered the child’s age, family income and receipt of Temporary Assistance to Needy Families, and whether the child was in foster care. Children were enrolled between March 6 and May 13, 2003. The Seattle Children’s Hospital and Regional Medical Center institutional review board approved this study. We obtained written informed consent (and, after April 15, 2003, a written Health Insurance Portability and Accountability Act release) from every family.

**Intervention and Outcome Measures**

The objective of the intervention was to facilitate initial contact between families and Head Start, and to transfer the medical documentation required for Head Start enrollment. Families of all children in the control and intervention groups were given a language-appropriate telephone contact list of all Head Start agencies in the metropolitan Seattle area. For intervention children, a referral packet was also generated by computer and mailed directly to Head Start by study personnel; the packet contained a physician referral letter, including information for Head Start to contact the family; a physical examination form; and the child’s immunization record. The second and third items were included only if available. Every Head Start agency in the target area participated in the project. None altered its established enrollment criteria to prioritize children from the study, and all signed a memorandum of understanding prior to study participation.

Families reported their primary language, whether the child was the family’s first or had any special health care needs, and whether the family had previous experience with Head Start enrollment.

Our primary outcome was Head Start attendance by January 2004. To obtain this information, a designated employee at each Head Start agency indicated by standardized checklist whether each child in both study groups was attending Head Start, on a waiting list, or neither. To test whether the intervention affected other steps leading to Head Start enrollment, we conducted a telephone survey in June 2003. We asked families whether they had been in contact with anyone from Head Start and, if so, whether the family or Head Start had been responsible for making this contact.

**Statistical Analysis**

We estimated a sample size of 100 in each study group to show a 20% difference in Head Start attendance with 95% certainty and 80% power, assuming a statistical worst-case scenario that 50% of children would attend Head Start. Children were randomly assigned to study groups within each clinic using a computerized random number generator (FIGURE). Telephone survey administrators, investigators, and Head Start personnel reporting enrollment data were blinded to study allocation.

We assessed intervention effect by intention-to-treat analysis, estimating relative risk and risk differences with log-binomial or binomial regression, adjusting for clinic as a fixed effect and correcting for family clustering using robust standard error estimates. Children were considered siblings if they had the same guardian and lived at the same address. Because only children from clinics 2 and 4 got onto Head Start waiting lists, only children from these clinics were included in waiting list–specific analyses.

We assessed effect modification by clinic by adding clinic × study group interaction terms to the base regression model or performed specific analyses.
models. To check for residual confounding, we estimated intervention effect by multivariable logistic regression, adjusting for child's age and sex, household size, primary language, parents' previous experience with Head Start enrollment, receipt of Temporary Assistance to Needy Families, and presence of special health care needs. We used logistic regression for this purpose because convergence could be achieved across a wider range of covariate combinations than with binomial or log-binomial regression. Statistical analyses were performed using Intercooled Stata 7.0 (Stata Corp, College Station, Tex).

**RESULTS**

Research assistants screened 366 children for Head Start eligibility. Of these, 115 were ineligible. Three additional children were excluded prior to randomization: 2 for having incomplete contact information and 1 at the parent's request. Of the 248 children randomized, 124 were allocated to each study group. One child was withdrawn from each group because both proved to be duplicates of previously randomized children. The analysis included 123 children in the intervention group and 123 in the control group. Among these, there were 4 sets of siblings, comprising 9 children in total.

Within each clinic, the proportion of children randomly assigned to the intervention group ranged from 46% to 57% (Table 1). There were no clinically meaningful differences between groups with regard to age, sex, household size, English being the family's primary language, or previous parental experience with Head Start enrollment.

The survey response rate was 75% (78% of intervention and 72% of control families). Fifty-seven percent of intervention families reported being in contact with Head Start, contrasted with 36% of control families (adjusted difference, 21%; 95% confidence interval [CI], 7%-35%) (Table 2). Of those families reporting contact with Head Start, 85% of intervention families reported that Head Start had initiated the contact, contrasted with 32% of control families (adjusted difference, 54%; 95% CI, 36%-71%).

Overall, 72 children in the study (29%) were either actively attending Head Start or on a waiting list by January 2004. Although 46 children enrolled in Head Start, 1 child in the control group dropped out prior to data collection, leaving 45 (18%) actively attending and 27 (11%) on a waiting list. In the intervention group, 50 children (41%) were either actively attending Head Start or on a waiting list, contrasted with 22 (18%) in the control group (adjusted difference, 17%; 95% CI, 8%-27%) (Table 2).

Thirty-one children in the intervention group (25%) were actively attending Head Start, contrasted with 14 children in the control group (11%) (adjusted difference, 12%; 95% CI, 3%-21%) (Table 2). Two Head Start attendees from the control group had siblings in the intervention group, and therefore possibly benefited from the intervention. Only children from clinics 2 and 4 got onto Head Start waiting lists. Among the children at these 2 clinics, 19 of 87 (22%) in the intervention group were on a waiting list at the time of data collection vs 8 of 94 (9%) in the control group (adjusted difference, 13%; 95% CI, 5%-21%).

Sample size limitations precluded reliable analysis of effect modification by

### Table 1. Baseline Characteristics of All Children Included in the Analysis

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention (n = 123)</th>
<th>Control (n = 123)</th>
<th>Adjusted Difference, % (95% CI)*</th>
<th>Adjusted Ratio (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants by clinic, No. (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic 1</td>
<td>12 (52)</td>
<td>11 (48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic 2</td>
<td>22 (46)</td>
<td>26 (54)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic 3</td>
<td>24 (57)</td>
<td>18 (43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic 4</td>
<td>65 (49)</td>
<td>68 (51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals, No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Head Start</td>
<td>41</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head Start</td>
<td>82</td>
<td>77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child and family characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male, No. (%)</td>
<td>67 (54)</td>
<td>72 (59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, mean (SD), y*</td>
<td>3.2 (1.3)</td>
<td>3.1 (1.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First child in family, No. (%)</td>
<td>58 (47)</td>
<td>58 (47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household size, mean (SD)</td>
<td>4.5 (1.6)</td>
<td>4.5 (1.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family’s primary language English, No. (%)</td>
<td>34 (28)</td>
<td>28 (23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent has past experience with Head Start enrollment, No. (%)</td>
<td>22 (18)</td>
<td>17 (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family receives TANF, No. (%)</td>
<td>35 (28)</td>
<td>29 (24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family reports special health care need, No. (%)</td>
<td>10 (8)</td>
<td>9 (7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: TANF, Temporary Assistance to Needy Families.

a Chi² test as of August 31, 2003 (beginning of the new Head Start year).

### Table 2. Effect of the Referral Intervention on Subsequent Contact With Head Start and Head Start Attendance

<table>
<thead>
<tr>
<th>No./Total (%)</th>
<th>Intervention (n = 123)</th>
<th>Control (n = 123)</th>
<th>Adjusted Difference, % (95% CI)*</th>
<th>Adjusted Ratio (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsequent Contact With Head Start (Telephone Survey)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family in contact with Head Start</td>
<td>54/95 (57)</td>
<td>32/88 (36)</td>
<td>21 (7-35)</td>
<td>1.6 (1.1-2.2)</td>
</tr>
<tr>
<td>Head Start initiated contact</td>
<td>46/54 (83)</td>
<td>10/31 (32)</td>
<td>54 (36-71)</td>
<td>2.9 (1.7-5.1)</td>
</tr>
<tr>
<td>Head Start Attendance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successfully connected to Head Start</td>
<td>50/123 (41)</td>
<td>22/123 (18)</td>
<td>17 (8-27)</td>
<td>2.4 (1.6-3.5)</td>
</tr>
<tr>
<td>Actively attending</td>
<td>31/123 (25)</td>
<td>14/123 (11)</td>
<td>12 (3-21)</td>
<td>2.3 (1.4-4.1)</td>
</tr>
<tr>
<td>On waiting list†</td>
<td>19/87 (22)</td>
<td>8/94 (9)</td>
<td>13 (5-21)</td>
<td>2.5 (1.1-5.3)</td>
</tr>
</tbody>
</table>

Abbreviation: CI, confidence interval.

*Adjusted for clinic site.
†Includes only children from clinics 2 and 4 because only these clinics contributed children to Head Start waiting lists.

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REFERENCES


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