

A Randomized Controlled Evaluation of the Effect of Community Health Workers on Hospitalization for Asthma

The Asthma Coach

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Objective: To test whether community health workers are able to reach low-income parents of African American children hospitalized for asthma and to reduce rehospitalization among them.

Design: A randomized controlled evaluation of usual care vs 2-year asthma coach intervention.

Setting: An urban children's hospital and the surrounding community.

Participants: A population-based sample of 306 children hospitalized for asthma met the inclusion criteria of being 2 to 8 years of age, of African American ethnicity, and having Medicaid coverage. Of these, 200 were contacted and 191 recruited with commitment to evaluation activities but, in order to assess reach, no commitment to participating in intervention.

Interventions: Coaches reinforced basic asthma education and encouraged key management behaviors through home visits and phone calls tailored to parent's readiness to adopt management practices and emphasize

ing a nondirective supportive style (cooperative and accepting of feelings and choices).

Outcome Measures: The reach of intervention to parents, contacts with coaches, and rehospitalization over 2 years based on hospital records.

Results: Within 3 months of randomization to the asthma coach group, 89.6% of parents had at least 1 substantive contact with the coach, with an average of 21.1 contacts per parent over the 24-month intervention. The proportion of children rehospitalized was 35 of 96 (36.5%) in the asthma coach group and 55 of 93 (59.1%) in the usual care group ($P < .01$), controlling for parental education and child age, sex, and hospitalization in the year prior to the index hospitalization. In surveys, parents indicated the importance of the nondirective approach to support.

Conclusions: An asthma coach can reach low-income parents of African American children hospitalized for asthma and reduce rehospitalization among the children.

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COMMUNITY HEALTH WORKERS¹⁻⁷ may help reduce the disproportionate asthma burden among children from low-income families that remains a hallmark of daunting disparities in health.⁸ Several articles have detailed the acceptability⁹ and benefits of community health workers in programs for low-income parents and their children with asthma.¹⁰⁻¹² In the present authors' *Neighborhood Asthma Coalition*,¹³ contacts with community health workers were associated with reduced acute care. The Robert Wood Johnson Foundation's *Allies Against Asthma*¹⁴ emphasized community health workers. One study found reductions in parent-reported urgent care (a combination of hospitalization, emergency care, and unscheduled clinic visits),¹² but no study

has shown an effect on hospitalizations based on medical records. Therefore, the present study provided controlled evaluation of a nonprofessional asthma coach to reduce objectively determined rehospitalization among low-income African American children previously hospitalized for asthma.

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Disease management programs often fail to reach those living with disadvantages. Evaluation needs to include reaching the intended audience, not simply efficacy within a volunteer sample.¹⁵ Recruitment in the present study maximized enrollment in an evaluation sample with no commitment to participation in

interventions to evaluate the extent to which the asthma coach could reach those whom other modalities have often failed to engage.

METHODS

PARTICIPANTS, RECRUITMENT, AND DESIGN

Participants were those serving as parents, usually mothers, of children hospitalized for asthma at St Louis Children's Hospital (SLCH). The inclusion criteria were Medicaid coverage, diagnosis of asthma made by admitting physician, residence in zip codes with a predominantly African American population in St Louis City and County, a phone number on record, and having a child aged between 2 and 8 years to ensure that the intervention for caregivers would remain appropriate throughout the 2-year intervention. Procedures were approved by the institutional review board at Washington University School of Medicine.

Figure 1 illustrates participant flow. The data manager retrieved information daily (Monday for weekends) from SLCH regarding all hospitalized with diagnoses of asthma. All who met eligibility criteria were forwarded to phone survey workers. Using standard protocols for number and distribution of attempts, they contacted potential participants (parents), implemented informed consent procedures, and, if participants agreed, completed baseline surveys. Parents were offered \$10 for completing the baseline survey. The informed consent was reviewed in detail at the time of baseline survey, sent to parents, and returned by mail. The consent included permission for review of hospital records for use of asthma care from 1 year prior to 24 months following randomization. Participants were assigned to either the asthma coach or usual care groups on the basis of random numbers, under supervision by the project statistician. Those randomized to the asthma coach group were assigned to a coach based on openings in their caseload.

Usual care followed a standard inpatient care pathway including asthma education and discharge planning, an asthma action plan, and a suggested follow-up appointment with the primary care provider within 1 week of discharge. The asthma coach group received 2 years of coaching in addition to usual care.

Ten dollars was offered for completion of evaluation surveys by telephone at 6, 12, and 18 months. At 24 months, \$50 was offered for completion of a final survey and home visit. Cash incentives were not contingent on participating in any intervention, and recruitment emphasized commitment only to the evaluation procedures. This was to enable testing of the ability of the coach to reach this population.

Recruitment ran from April 1997 through February 1999, with the 24-month interventions running through February 2001 and the last survey in March 2001.

COACH INTERVENTION

The coaches were 2 African American women with high school education residing in the same general neighborhoods as the participants. They were full-time university employees. One was recruited from a similar position in a previous project¹³ and identified the second through her church. Both women remained coaches throughout the intervention. A third coach, also an African American woman, was recruited during the course of the project when the case load was greatest. Initial training took 3 months and covered the asthma disease process, asthma action plans, communication techniques, social support, and be-

havior change strategies, including those of the Transtheoretical Model.¹⁶ Training of the coaches continued through weekly supervision meetings with a nurse (R.K.-S.) and psychologist and expert in the Transtheoretical Model (G.R.H.).

The coach intervention was designed to achieve standardization through a set of key behavioral objectives and a planned schedule of contacts as well as flexibility through a nondirective approach and individualization of key behavioral objectives.

Standardization: Key Behavioral Objectives

Based on national guidelines¹⁷ and previous work with this population,¹³ 7 key asthma management behaviors were identified¹: use of an Asthma Action Plan²; administration of asthma-controller medications³; administration of asthma-reliever medications at first symptoms⁴; attendance at asthma monitoring visits with a primary care provider every 3 to 4 months⁵; development of a collaborative partnership with the primary care provider⁶; minimization of exposure to second-hand tobacco smoke; and⁷ minimization of exposure to cockroach allergen. Because of its centrality, use of an action plan was given priority.

Standardization: Planned Schedule of Contacts

Within 3 days after the baseline survey, the coach initiated phone contact to establish rapport, describe how she could help the parent, and schedule a visit at their home or a neutral site (eg, local fast-food restaurant) within the following week. During this and a second home or neutral-site visit they reviewed the 7 key asthma management behaviors and assessed the subjects' readiness to adopt each. Subsequent contacts focused on problem solving and adoption of these 7 key behaviors. Following the second visit, the coach called the parent biweekly for 3 months, after which calls were monthly for the duration of the 2-year intervention.

Flexibility: Nondirective Tailored Approach

The key behavioral objectives and planned schedule provided overall structure. However, the coach intervention was implemented in a flexible manner that followed a nondirective supportive style (cooperative and accepting of feelings and choices).¹⁸⁻²⁰ Coaches did not prescribe parents' actions but worked with them to identify goals and steps to achieve them.

Using the Transtheoretical Model,¹⁶ coaches categorized parents' readiness to adopt each key management behavior according to stage: precontemplation, contemplation, preparation, action, or maintenance. Coaches used a compendium of messages for each stage and behavior to individualize messages.²¹ Use of the asthma action plan was emphasized with all parents. The other 6 behaviors were discussed in order of readiness to adopt them, incorporating behavioral shaping articulated by Skinner²² and tailoring according to individual readiness.¹⁶

Response to Rehospitalization

The data manager, who had no direct contact with participants, monitored the records of SLCH monthly and identified participants who had been rehospitalized for asthma. She forwarded these to the coaches, who reinitiated biweekly contact following rehospitalization. They reviewed the 7 key management behaviors and problems indicated by the rehospitalization. In practice, parents usually contacted coaches themselves following rehospitalization prior to their identification by research staff.

OUTCOMES

Hospitalizations

Based on case numbers, addresses, names of guardians and children, and children's dates of birth, records of all emergency care and hospital admissions at SLCH were scanned electronically to identify all instances of asthma care. St Louis has a second pediatric hospital, Cardinal Glennon Children's Hospital, but its records were not reviewed. This raises 2 concerns: the generality of the findings and possible bias from incomplete capture of endpoints. Regarding generality, contemporaneous epidemiological data of hospitalizations due to pediatric asthma in St Louis²³ identified SLCH as accounting for 70.0% of all hospitalizations for asthma among children aged between 0 and 14 years in zip codes from which the present sample was drawn. Regarding incomplete capture, the same contemporaneous study showed that of those admitted to SLHC, only 4.8% had any admission to Cardinal Glennon. Therefore, it is assumed that in the study cohort, more than 95% of readmissions would be to SLCH, providing nearly complete ascertainment of all readmissions among study participants. Statistical analyses evaluated the sensitivity of observed results to violation of this assumption.

Those abstracting hospitalization data from charts were blind to condition and to the nature of the comparison between coaching and usual care.

Coaches' Records

"Substantive contacts" were those in which at least 1 key asthma management behavior was discussed. For each contact, coaches' records included the stage of readiness to adopt each key behavior.

Telephone Surveys

At randomization and 6, 12, 18, and 24 months later, trained survey workers who were blinded to condition conducted computer-assisted surveys with parents by telephone. In the final 24-month survey and after all other data were entered, the computer-assisted program presented several pairs of sentences for which parents in the asthma coach group were asked to indicate which of each pair best described the coach. Two pairs reflected a choice between whether the coach provided more non-directive or directive support.

STATISTICAL ANALYSIS

Descriptive statistics, scatter and box plots, and χ^2 , Fisher exact, Wilcoxon rank sum, and *t* tests were used to characterize the sample and its representativeness relative to those not recruited. Descriptive statistics were also used to characterize the asthma coach intervention.

Because of skewed distribution of hospitalizations for asthma, the principal analysis of the effects of the asthma coach used logistic regression evaluating the relationship between the percentage of children with 1 or more hospitalization during the 2 years following randomization and coaching vs usual care as well as potential confounders drawn from the literature and/or baseline data. Logistic regression also was used to evaluate interactions between the main effect of intervention and other variables such as prior hospitalization. Confounders not found significant in principal analyses of the intervention were dropped from the analyses of interactions to maximize their sensitivity to factors that might moderate or limit the main effect of coach

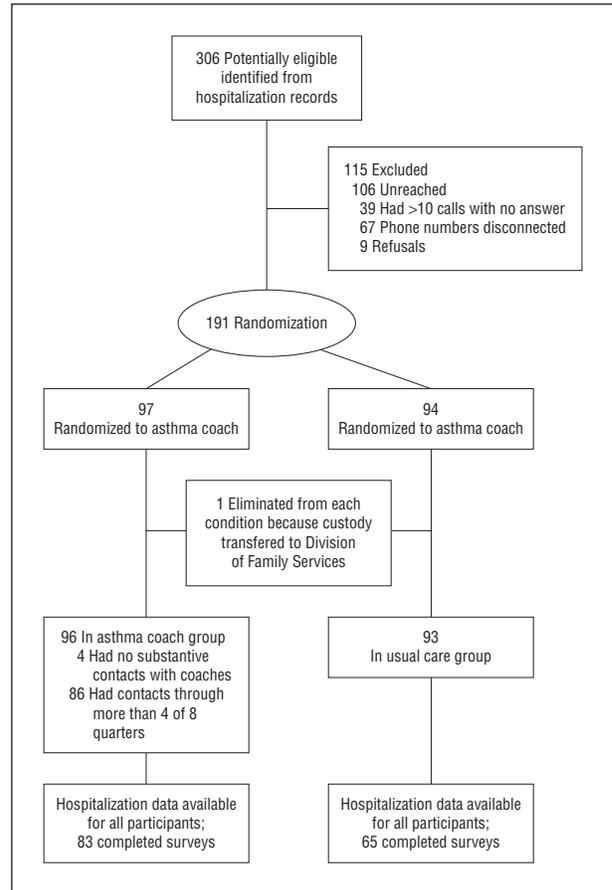


Figure 1. Consolidated Standards of Reporting Trials (CONSORT) flowchart of recruitment, reach of intervention, and retention.

vs usual care. Logistic regression was also used to evaluate differences between conditions in emergency care adjusted for emergency care in the year prior to randomization.

Information measures (eg, Akaike's Information Criterion) and log-likelihood statistics were used to compare nested models and to select the smallest model containing the largest amount of information regarding the outcome. Goodness of fit was assessed using the Hosmer-Lemeshow test, and deviance residuals were used to check for the presence of outliers.

Repeated-measures analysis of covariance was used to characterize the pattern of coach contacts over time. Regression analyses were used to identify relationships between contacts and outcomes.

Based on previous work,¹³ a readmission rate of 60% was expected in the usual care group. A sample size of 95 participants per study group provided approximately 80% power to identify a significant difference if the readmission rate were 33% less (ie, 40%) in the asthma coach group.

RESULTS

PARTICIPANTS

A total of 200 of 306 potentially eligible parents (65.4%) were contacted and 191 were enrolled (95.5% of those reached; 62.4% of all potentially eligible) (Figure 1). Randomization assigned 94 to usual care and 97 to an asthma coach. After randomization, 1 parent from each group was withdrawn because of transfer of custody to child

Table 1. Baseline Characteristics of Patients Randomized to AC or UC and of Those NCR and Significance Levels of Tests of AC vs UC and of Pooled Samples of AC and UC vs NCR

Characteristic	No. (%)			P Value	
	AC (n = 96)	UC (n = 93)	NCR (n = 115)	AC vs UC	AC/UC vs NCR
Child's mean (SD) age, y	5.00 (2.18)	4.75 (1.95)	4.56 (2.12)	NS	NS
Male	49 (51)	63 (67.7)	78 (67.8)	.02	NS
Parent's mean (SD) age, y	29.5 (7.67)	28.5 (8.20)		NS	
Range	19-68	20-62			
Parent's education					
<High school	29 (30.2)	33 (35.5)			
High school/GED	45 (46.9)	31 (33.3)		NS	
Some college	20 (20.8)	24 (25.8)			
College graduate	2 (2.1)	5 (5.4)			
Parent's marital status					
Unknown	8 (8.3)	3 (3.2)			
Married	5 (5.2)	11 (11.8)		NS	
Single	82 (85.4)	78 (83.9)			
Divorced	1 (1.04)	1 (1.08)			
Mean (SD) hospitalizations in previous 12 mo	.47 (0.864)	.49 (0.789)	.33 (0.633)		
Range	0-4	0-4	0-3	NS	NS
Patient hospitalizations					
0	66 (70.2)	60 (64.5)	86 (74.8)		
1	18 (19.1)	23 (24.7)	21 (18.3)	NS	NS
≥2	10 (10.7)	10 (10.8)	8 (7.0)		
Emergency department visits for asthma in previous 12 mo	1.07 (1.81)	0.94 (1.39)	0.60 (1.05)		
Range	0-10	0-7	0-7	NS	.02
Patient visits to emergency department					
0	54 (56.3)	48 (51.6)	73 (63.5)		
1	18 (18.8)	26 (28.0)	27 (23.5)		
2	8 (8.3)	7 (7.5)	7 (6.1)	NS	NS
3	9 (9.4)	7 (7.5)	7 (6.1)		
4	7 (7.3)	5 (5.5)	1 (0.9)		
Mean (SD) parents' rating of symptoms in previous week at randomization ^a	2.28 (0.516)	2.35 (0.504)		NS	

Abbreviations: AC, asthma coach; GED, general educational development; NCR, not contacted or recruited; NS, not significant; UC, usual care.
^aRated as 1, very often; 3, never.

care services. Of the remaining 96 in coach and 93 in usual care, 95 and 90 parents, respectively, were the children's mothers.

Table 1 shows that the usual care and coach groups and those not recruited were similar, except that the coach group had fewer men than the usual care group ($P = .02$). Accordingly, the sex of the child was controlled in initial analyses. Those not recruited were similar to those recruited except for having significantly fewer emergency visits during the year prior to the index hospitalization. As depicted in Figure 1, a total of 83 of 96 of those in the coach and 65 of 93 in the usual care group completed final surveys 24 months following randomization. This differential follow-up rate did not affect the principal endpoint based on hospitalization data obtained from hospital records.

INTERVENTION

During months 1 to 3 following randomization, 86 of the 96 (89.6%) parents randomized to the coach group had at least 1 substantive contact with the coach. These and other data regarding the intervention delivery are depicted in **Table 2**. Contact was appreciable and sustained. By design, contact was less frequent after the first

year, but 74 of the 96 (77.1%) parents still had at least 1 contact with the coach during the last 3 months of the intervention.

Audits of coach contacts evaluated how many of the 7 key asthma management behaviors were staged at least once in each 3-month period. As also depicted in Table 2, these indicated appreciable attention to all of the key management behaviors. Note that not all children were prescribed medication to control their asthma, accounting for the somewhat lower levels of staging of this behavior.

Coaches also discussed general stressors, eg, moving residence (39.6% of parents), social service resources (34.4%), housing (11.5%), illness or other problems of the parent (24.0%), and a new job (6.3%). Only 9 of the 96 participants' (9.4%) audits did not indicate discussion of such topics.

OUTCOMES

Hospitalizations

The primary outcome for the study was hospitalization for asthma during the 2 years following randomization that the coach was available to parents. Over this period, 35 of 96 (36.5%) in the coach and 55 of 93 (59.1%)

Table 2. Contact Data^a

Contact Data	Month								Total 1-24
	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	
Mean contacts, No.	4.21	3.43	2.79	2.63	2.20	2.34	1.83	1.83	21.10
25th Percentile	2.0	2.0	2.0	2.0	1.0	2.0	.25	1.0	16.25
50th Percentile	4.5	3.0	3.0	3.0	2.0	2.0	2.0	2.0	22.50
75th Percentile	6.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	27.00
Patients with zero contacts, %	10.4	8.3	5.2	8.3	12.5	15.6	25.0	22.9	4.2
Cases staged per 3-mo period for each key management behavior, %									
Use an asthma action plan	96.5	70.9	74.4	83.7	84.9	90.7	83.7	76.7	
Administer regular asthma medications ("controller" medications)	70.9	52.3	54.7	53.5	64.0	66.3	61.6	57.0	
Administer responder medications at first sign of symptoms ("reliever" medications)	95.3	69.8	67.4	75.6	84.9	88.4	83.7	76.7	
Attend asthma monitoring visits with primary care provider every 3-4 mo	96.5	65.1	70.9	81.4	82.6	89.5	83.7	76.7	
Develop a collaborative partnership with the primary care provider	95.3	65.1	69.8	82.6	82.6	89.5	83.7	76.7	
Minimize exposure to second-hand tobacco smoke	95.3	58.1	62.8	70.9	80.2	88.4	83.7	76.7	
Minimize exposure to cockroach allergen	93	67.4	70.9	74.4	80.2	86.0	82.6	75.6	

^aContact data for 96 participants randomized to asthma coach in each 3-month period following randomization, total contacts across all 24 months, and, for the 86 contacted within months 1 through 3, percentage of cases staged on each key asthma management behavior.

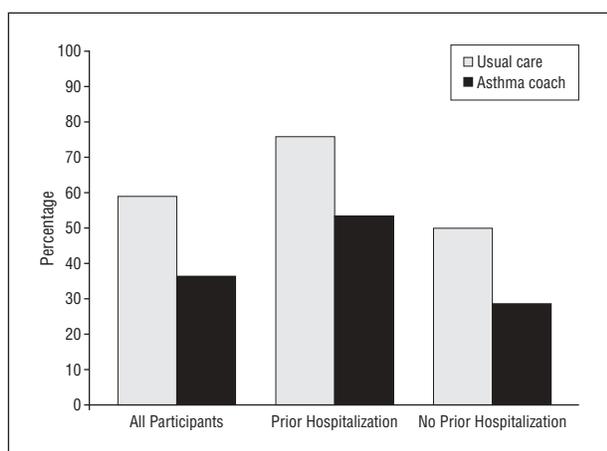


Figure 2. Percentage of cases with at least 1 hospitalization in the first and second years following randomization for all participants disaggregated by treatment group, usual care or asthma coach, and for those with or without hospitalization in the year prior to admission.

in usual care group were hospitalized at least once (Fisher exact test $P=.002$; 95% confidence interval [CI], 0.11-0.34) (**Figure 2**).

Logistic regression of the percentage with 1 or more hospitalization during the 2 years following randomization included control for potential confounders (hospitalization during the year prior to randomization, child's age and sex, parents' education) (**Table 3**). Intervention (coach vs usual care) was highly significant ($P=.008$) and the relative risk for the likelihood of any hospitalization in the coach relative to the usual care group was 0.61 (95% CI, 0.45-0.83). Of the confounders, only hospitalization in the year prior to randomization was significant ($P<.001$).

Further logistic regression tested whether the coach intervention was successful for those with and without prior hospitalization. Because they were not significant in the overall analysis ($P=0.41-0.87$) and to maximize power, other potential confounders were not included in this analy-

Table 3. Analysis of Predictors of Hospitalization in Years 1 and 2 Following Randomization to Asthma Coach or Usual Care

Parameter	OR (95% CI)	P Value
Intercept		.49
Asthma coach	0.43 (0.23-0.81)	.008
Usual care	1 [reference]	
Admission in prior year		<.001
Yes	3.09 (1.59-6.02)	
No	1 [reference]	
Sex of child		.41
Male	1.31 (0.69-2.47)	
Female	1 [reference]	
Age of child, y		.87
<5	1.05 (0.57-1.95)	
≥5	1 [reference]	
Caregiver's education		.74
<HS diploma	1.12 (0.57-2.20)	
HS/GED or more	1 [reference]	

Abbreviations: CI, confidence interval; GED, general educational development; HS, high school; OR, odds ratio.

sis of previous hospitalization. The coach intervention ($P=.02$) remained a significant predictor of hospitalization. In addition, the interaction between coaching and prior hospitalization was not statistically significant ($P=.89$), indicating that the coach intervention reduced hospitalization whether or not participants were hospitalized in the year prior to randomization (Figure 2).

To characterize the overall effect of the intervention, the mean number of admissions per child was 1.518 for the usual care group and 0.728 for the coach group over the 2-year period. Using generalized (Poisson) linear models and controlling for admissions in the prior year, the main effect of coaching vs usual care was significant ($P<.001$).

As noted in the Methods, it is estimated that less than 5% of the present sample would be expected to have any admissions at facilities other than SLCH. To test the sensitivity of the present analyses to possible biases from this

small percentage of unascertained events, additional analysis assumed that 5% of actual admissions (11 admissions) aggregated across both conditions were missed and, conservatively, that all 11 occurred in the coach condition. Because the principal analysis used a dichotomous outcome (any vs no admission in 2 years of intervention), the additional admissions were assigned to coach participants, assuming all were equally likely to have 1 or more additional admissions. Because 35 of 96 children (36.5%) in the coach group had at least 1 observed admission, 36.5% of the 11 admissions (4 admissions) were assigned to those who had previous admissions and 63.5% (7 admissions) were assigned to those with no observed admissions. This raised the total number in the coach group with 1 or more admission by 7, from 35 of 96 to 42 of 96 subjects, or 43.75%, still significantly less than the percentage for the usual care group (59.14%; Fisher exact $P = .04$).

Logistic regression analyses also examined the percentage of those with emergency visits not followed by hospitalization during the 2 years following randomization. Because of the different endpoint, these controlled again for child's age and sex, mother's education, and hospitalization in the year prior to randomization. The difference between the coach and usual care groups was not significant ($P = .11$), with 64% of children in the coach group and 54% of those in the usual care group with at least 1 emergency visit (relative risk, 1.19; 95% CI, 0.94-1.51). Of the covariates, only hospitalization in the year prior to randomization predicted an emergency visit ($P = .008$).

Contact With Coaches

Contacts declined significantly over time ($F_{1,86}$ for linear component of time effect = 9.44; $P = .003$), controlling for parent's education, child's age and sex, and prior hospitalization. This did not differ by admission following randomization ($P = .42$).

Multiple linear regression examined the parent's education and child's age, sex, and admissions in the year prior to randomization and in the first year following randomization as predictors of the number of coach contacts. In each of years 1 and 2 following randomization, hospitalization during the same year predicted contacts (standardized $\beta = .26$, $P = .02$ for year 1; standardized $\beta = .24$, $P = .01$ for year 2). Additionally, previous contact with the coach in year 1 predicted more contacts in year 2 (standardized $\beta = .56$, $P < .001$). Thus, coach contacts were predicted not by individual characteristics such as age or sex, but by greater need (concurrent hospitalizations) and by experience with the coaches (previous contacts).

In the survey 24 months after randomization, parents were read several pairs of sentences. Each pair contained a sentence depicting the coach as providing directive support and another as providing nondirective support. For each pair, parents were asked to indicate which sentence best described the coach. In the first pair, 66 of 80 parents chose, "Help you to do what you think is right for your child's asthma" rather than "Push you to do what she thinks is right. . . ." In the second pair,

78 of 80 respondents chose, "Help you to 'take charge' of your child's asthma care" rather than "Take charge of your child's asthma care" (probabilities of observed differences $< .001$ for each). These choices were consistent with the coach intervention providing nondirective support that is encouraging and cooperative without taking over or telling recipients what to do.¹⁸⁻²⁰

COMMENT

The asthma coach intervention achieved lower prevalence of hospitalizations (36.5% in the coach group vs 59.1% in the usual care group) among low-income, Medicaid-covered, African American children. Because previous hospitalizations are strong predictors of subsequent hospitalizations,²³ it is important that the coach was effective with or without prior history of hospitalization.

The 52% reduction in hospitalization (mean admissions per child, 0.73 in the coach and 1.52 in usual care group) is comparable with the effect of interventions implemented by professionals.²⁴⁻²⁷ These ranged from 22% reduction among children (18.9% in the control vs 14.8% in the intervention group) in intervention implemented by social workers in the National Inner City Asthma Study²⁸ to 75% reduction (0.57 per patient in the control to 0.14 in the intervention group) using a nurse-administered intervention in a large health maintenance organization.²⁴ Other studies using nurses achieved reductions of 54%²⁶ and 31.7%²⁹ or, using nurse/physician pairs, 58%.²⁵ Thus, the peer coaches achieved reductions in hospitalization among low-income underserved children that are comparable with those achieved with professionals.

To reduce disparities, programs must reach those living with disadvantages.¹⁵ The present population-based sample included 95.5% of those able to be contacted by telephone. Although this may have introduced some bias in recruitment, it should be noted that those recruited were similar to all cases initially eligible (Table 1). Because they were recruited with no commitment to participate in any intervention but only to evaluation procedures, the engagement of 95.8% in substantive contacts and the sustained engagement over 24 months indicates that peer coaches can reach and engage high-priority populations.

The coach did not lead to a decrease in emergency visits not followed by hospitalization. Reduced hospitalization without corresponding reduction of emergency care was also observed in several other studies among adults²⁶ and children.²⁸ Possible explanations include that acuity at arrival for emergency care may be reduced by having learned to initiate treatment before emergency care or to seek emergency care earlier. Interventions may also prepare individuals so that emergency staff view them as better able to care for their children or themselves and, thereby, not require hospitalization.

The flexible nondirective¹⁸⁻²⁰ approach was reflected in the characterizations of the coach interventions, eg, "Help you to do what you think is right. . . ." Several features are worth noting. In response to parents declining

participation, coaches said they would call back in a few weeks to “check in with you,” not “check up on you,” a distinction that typified the intervention. Coaches noted that calling back often made a strong impression on parents for whom such continuity is not typical of the health care system. Although nondemanding, the coaches’ interest was reliable and persistent. The 95.8% reach to this audience likely reflects these features. The benefits of the coach may also rely on the nondirective approach encouraging discussion of stressors not directly related to asthma but that other studies^{23,30-32} have implicated in disproportionate asthma morbidity. These characteristics of the coach intervention reflect other work supporting collaborative³³⁻³⁷ rather than prescriptive approaches to health promotion.

Limitations of the study include lack of complete ascertainment of hospitalization data, lack of cost analysis, and the loss to follow-up in survey data. Additionally, recruitment through a single hospital and exclusion of those with no telephone numbers in hospital records on which recruitment was based may somewhat limit the generality of findings.

The specific features of asthma management and specific outcome of repeat hospitalization led to caution in generalization to other problems. Nevertheless, the success of the asthma coach in reaching low-income members of ethnic minority groups, the focus on specific management behaviors, and the hardy results for an important objectively measured outcome make the current findings a contribution to the literature¹⁻⁷ on the value of community health workers and peer support in diverse areas of prevention and disease management.

The asthma coach reached and sustained engagement of low-income groups with disproportionate asthma morbidity and reduced hospitalizations among them. This orderly sequence of effects supports the use of peer intervention for reaching and benefiting low-income groups.

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Announcement

Submissions. The Editors welcome contributions to Picture of the Month. Submissions should describe common problems presenting uncommonly, rather than total zebras. Cases should be of interest to practicing pediatricians, highlighting problems that they are likely to at least occasionally encounter in the office or hospital setting. High-quality clinical images (in either 35-mm slide or electronic format) along with parent or patient permission to use these images must accompany the submission. The entire discussion should comprise no more than 750 words. Articles and photographs accepted for publication will bear the contributor's name. There is no charge for reproduction and printing of color illustrations. For details regarding electronic submission, please see: <http://archpedi.ama-assn.org>.

discussion, however, we do not argue that we definitively show the existence of an environmental trigger associated with precipitation. Rather, we argue that if our results are driven by the existence of such a trigger, then the magnitude of the relationship is sufficiently large that further study is warranted.

In summary, although we agree with Braun and Kalkbrenner that caution is needed in interpreting our results, this does not change the conclusions we draw from the study. Our results are consistent with the existence of an environmental trigger for autism that is positively associated with precipitation. Further research focused on establishing whether such a trigger exists and identifying specific triggers is warranted.

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Correction

Errors in Correspondence and Additional Information. In the article titled "A Randomized Controlled Evaluation of the Effect of Community Health Workers on Hospitalization for Asthma," by Fisher et al, published in the March issue of the *Archives* (2009;163[3]:225-232), the addresses for Correspondence and Additional Information were incorrect. The Correspondence address should have read: Edwin B. Fisher, PhD, Department of Behavior and Health Education, University of North Carolina at Chapel Hill, Campus Box 7440, Chapel Hill, NC 27599-7440 (edfisher@unc.edu). The Additional Information should read: Reference 21 is available from Gabrielle R. Highstein, PhD, RN, Winds of Change at Crosswinds, 154 Hatchville Rd, East Falmouth, MA 02536 (gabe.highstein@gmail.com).