

Cultural Competence Policies and Other Predictors of Asthma Care Quality for Medicaid-Insured Children

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ABSTRACT. *Objective.* More than half of Medicaid enrollees are now in managed care. Scant information exists about which policies of practice sites improve quality of care in managed Medicaid. Children with asthma are a sentinel group for Medicaid quality monitoring because they are at elevated risk for adverse outcomes. The objective of this study was to identify practice-site policies and features associated with quality of care for Medicaid-insured children with asthma.

Methods. A prospective cohort study with 1-year follow-up was conducted in 5 health plans in California, Washington, and Massachusetts. Data were collected via telephone interviews with parents at baseline and 1 year, surveys of practice sites and clinicians, and computerized databases. The practice site survey asked about policies to promote cultural competence, the use of several types of reports to clinicians, support for self-management of asthma, case management and care coordination, and access to and continuity of care. Quality of care was evaluated on the basis of 5 measures: 1) preventive medication underuse based on parent report; 2) the parent's rating of asthma care; 3) the 1-year change in the child's asthma physical status based on a standardized measure; 4) preventive medication underprescribing based on computerized data; and 5) the occurrence of a hospital-based episode.

Results. Of the 1663 children in the study population, 67% had persistent asthma at baseline based on parent report of symptoms and medications. At 1-year follow-up, 65% of the children with persistent asthma were underusing preventive medication based on parent report. In multivariate analyses, patients of practice sites with the highest cultural competence scores were less likely to be underusing preventive asthma medications based on parent report at follow-up (odds ratio [OR]: 0.15; 95% confidence interval [CI]: 0.06–0.41 for the highest vs lowest categories) and had better parent ratings of care. The use of asthma reports to clinicians was predictive of less preventive medication underprescribing based on computerized data (OR: 0.33; 95% CI: 0.16–

0.69), better parent ratings of care, and better asthma physical status at follow-up. Patients of practice sites with policies to promote access and continuity had less underuse of preventive medications (OR: 0.56; 95% CI: 0.34–0.93). Among the 83 practice sites, the practice site's size, organizational type, percentage of patients insured by Medicaid, mechanism of payment for specialty care, and other primary care features were not consistently associated with quality measures.

Conclusions. Practice-site policies to promote cultural competence, the use of reports to clinicians, and access and continuity predicted higher quality of care for children with asthma in managed Medicaid. *Pediatrics* 2004; 114:e102–e110. URL: <http://www.pediatrics.org/cgi/content/full/114/1/e102>; asthma, Medicaid, cultural competence, quality of care.

ABBREVIATIONS. ACQA, Asthma Care Quality Assessment; ED, emergency department; HMO, health maintenance organization; OR, odds ratio; CI, confidence interval.

Medicaid-insured children with asthma pose important challenges in clinical practice. Poor and minority children are at elevated risk for asthma hospitalization, and many do not receive appropriate outpatient treatment.^{1–4} In general, Medicaid-insured children may receive worse care than privately insured children, even when they are in the same health plans.⁵ Scant information exists to help clinicians and policy makers understand how to improve health care quality effectively for children in managed Medicaid arrangements.⁶

Clinicians who treat Medicaid-insured children need better information about which practice-site policies most enhance quality of care for this vulnerable group. Three general categories of practice-site policies are those that are tailored to low-income populations, chronic care policies, and primary care elements. Policies that are tailored to low-income populations attempt to promote cultural competence,^{7–9} communication, and empowerment. Policies described in the Chronic Care Model include self-management support, decision support, clinical information systems, delivery system design, health care organization, and community resources.¹⁰ Primary care elements have been defined as first-contact care (commonly called access), longitudinality (continuity), comprehensiveness, and coordination.¹¹ Other features of practices that could potentially influence health care quality include how care is fi-

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nanced (capitated or fee for service), size, organizational type (eg, private office or community health center), and whether the population is predominantly Medicaid insured or commercially insured.

This study addresses the critical gap in information about which practice-site policies and features influence asthma care quality for Medicaid-insured children. This research is unique in that we measured potential predictors simultaneously at the practice site, clinician, and patient levels, then evaluated quality based on parent report as well as computerized data over a 1-year follow-up period. Our aims were to 1) evaluate asthma care quality for children with managed Medicaid and 2) identify practice-site and clinician-level predictors of asthma care quality for these children.

METHODS

Design and Settings

The Asthma Care Quality Assessment (ACQA) Project was a prospective cohort study with 1-year follow-up of Medicaid-insured children with asthma in 5 large nonprofit health plans: the Harvard Vanguard Medical Associates population of Harvard Pilgrim Health Care in Massachusetts, Kaiser Permanente in Northern California, group Health Cooperative of Puget Sound in Washington State, Neighborhood Health Plan in Massachusetts, and Partnership Healthplan of California. In the first 3 health plans, most members were commercially insured through their employer, and the populations selected for this study were served by a large multispecialty provider group that contracted exclusively or almost exclusively with the health insurer. In contrast, the last 2 health plans were Medicaid predominant, network managed care organizations that contracted with a variety of provider groups, including multispecialty and pediatric physician groups and community health centers. In all of these health plans, primary care services were capitated for most members, whereas the payment mechanisms for specialty and hospital services varied among plans.

Data Collection

Four respondent groups contributed data for this study: 1) parents of children with asthma, via telephone interviews at baseline and 1-year follow-up; 2) clinicians who were the primary care clinicians for these children, via written surveys at baseline and follow-up; 3) practice site administrators, via written surveys; and 4) health plan administrators and other key informants, via face-to-face and telephone interviews in which we gathered contextual information. Health care use data, including hospitalizations, emergency department (ED) visits, outpatient visits, and medications, were collected by analysis of computerized databases for the years before and after the baseline interviews. Asthma-related use was identified using *International Classification of Diseases, Ninth Revision* 493.0 to 493.9 and a list of appropriate medications.

The target population was Medicaid-insured children aged 2 to 16 years with asthma confirmed by both computerized utilization data and parent report. Potentially eligible children were identified via 1) a physician's diagnosis of asthma based on an *International Classification of Diseases, Ninth Revision* code of 493.0 to 493.9 at an outpatient clinic visit, ED visit, or hospitalization or 2) 1 or more prescriptions for cromolyn, nedocromil, or inhaled corticosteroids or 2 or more prescriptions for β -agonist medications during the 12 months before October 1998, the index date for cohort identification. All children identified as potentially eligible were included in interview and survey attempts, except at Neighborhood Health Plan, where we drew a random sample of 1000 because of the large population size.

Parent Interviews

Using a closed-ended telephone interview, we collected information from parents about the child's asthma status, medication use, parent reports and ratings of care, demographics, and family structure. Measures were based on previously validated instru-

ments, including the American Academy of Pediatrics Children's Health Survey for Asthma and the Consumer Assessment of Health Plans Survey instrument for childhood asthma.¹² Baseline telephone interviews were conducted during February to October 1999, with follow-up interviews 1 year later. Surveys with identical content were mailed to families who were not reached by telephone. A \$10 incentive for interview participation was offered, and the study was approved by the Institutional Review Boards at participating sites.

Clinician Surveys

The primary provider for each child in the initially identified sample was identified using utilization and personal physician databases at the time of cohort identification. Each clinician was mailed a closed-ended, self-administered survey at baseline and at follow-up. The survey asked clinicians to report their experiences with selected features of asthma care, for example, whether they used asthma guidelines, reports, registries, written management plans, or disease management programs; had experienced any barriers to specialty referrals; or had been subject to any financial incentives that might influence asthma care. To gauge clinicians' propensity to use inhaled anti-inflammatory medications, we presented 4 vignettes that described standardized patients.¹³ The survey also included questions on the demographic characteristics of the clinicians and their practice groups.

Practice Site Surveys

Two surveys were mailed to each practice site, defined as a provider or a group who saw patients in the same location(s). These closed-ended, self-administered instruments were usually completed by a clinician or a nurse manager at each site, sometimes with the input of other clinicians. The surveys asked questions about the basic features of each practice site, including its size, organizational type (eg, community health center, health maintenance organization [HMO], private office) and the demographics and insurance coverage of its patient population. It included questions about selected practice-site policies for low-income populations, chronic care, and primary care.^{10,11} Details about the specific items asked for each policy are included in Table 1. For example, there were 6 questions on cultural competence policies, including whether the practice attempted to recruit ethnically diverse providers or offered cross-cultural or diversity training. Questions on care for low-income populations were derived from literature review and focus groups with clinicians and staff at 3 urban primary care clinics.

Conceptual Model and Predictors

The analysis used the conceptual model depicted in Fig 1. Predictor variables were categorized as practice-site policies and features, clinician practices, and patient characteristics. Practice-site policies and features included policies for low-income populations (cultural competence, patient empowerment, and communication with non-English speakers and patients with low literacy), chronic care policies (case management, reports to clinicians, support for self-care, and use of guidelines), and primary care elements (access, continuity, and coordination). Practice-site organizational features included size, type of practice site, percentage of patients with Medicaid, mechanisms for specialty care access, and financial incentives. Clinician practices included the self-reported propensity to prescribe preventive asthma medications, the use of case managers, and the receipt of reports on asthma, such as lists of patients with asthma or feedback reports on their prescribing practices. Patient characteristics included age, gender, race/ethnicity, parent education, household income, number of parents at home, length of enrollment in the health plan, and baseline asthma status.

Quality Measures

Five measures of asthma care quality were defined a priori on the basis of national guidelines: preventive medication underuse, parent ratings of care, the 1-year change in the child's asthma physical status based on the American Academy of Pediatrics' Child Health Survey for Asthma, preventive medication underprescribing, and hospital-based episodes.^{14,15} Preventive medication underuse was measured using parent report and was defined

TABLE 1. Selected Policies of Practice Sites to Support Low-Income Populations, Chronic Care, and Primary Care in the ACQA Project

	All Practice Sites N = 83; n [%]	Cronbach α^*
Policies for low-income populations		
Cultural competence (policies included in summary score)		
Recruits ethnically diverse nurses and providers	49 (71.0)	
Recruits bilingual nurses and providers	40 (58.0)	
Attempts to minimize cultural barriers through printed materials	34 (48.6)	
Offers cross-cultural or diversity training	26 (39.4)	
Offers training to providers to develop communication skills	16 (23.5)	
Evaluates the level of cultural competence among providers	9 (14.5)	
Cultural competence summary score (0–6)		.85
5–6	11 (18.6)	
3–4	16 (27.1)	
1–2	22 (37.3)	
0	10 (17.0)	
Communication-related practices		
Offers access to interpreters	52 (74.3)	
Provides interpreter service via telephone	41 (63.1)	
Provides low-literacy health educational materials	41 (59.4)	
Policies for chronic care		
Reports to clinicians		
Provides clinicians with lists of asthma patients	10 (14.5)	
Uses asthma registries that prompt clinicians about appropriate medications or services	15 (22.1)	
Provides reminders to clinicians about asthma guideline adherence for individual patient encounters	23 (33.8)	
Gives feedback reports to clinicians to improve performance in asthma care	21 (30.4)	
Reports to clinicians summary score		.85
4	3 (4.5)	
3	9 (13.4)	
2	10 (14.9)	
1	9 (13.4)	
0	36 (53.7)	
Self-management tools		
Promotes self-management using problem-solving and patient empowerment methods	33 (49.3)	
Prepares individualized written asthma care plans	30 (43.5)	
Makes asthma care plans readily accessible to primary and acute care providers	38 (55.9)	
Makes peak flow meters available at low cost to enrollees	57 (82.6)	
Makes spacers available at low cost to enrollees	59 (84.3)	
Makes nebulizers available for rent or purchase at low cost to enrollees	52 (74.3)	
Self-management tools summary score (0–6)		.80
5–6	24 (38.1)	
3–4	26 (41.3)	
0–2	13 (20.6)	
Policies for primary care		
Access and continuity		
Promotes appointments for preventive chronic asthma management visits	64 (91.4)	
Makes telephone advice always available, including weekday evenings and weekend daytime hours	62 (87.3)	
Makes same-day appointments always available, including weekday evenings and weekend daytime hours	51 (71.8)	
Ensures follow-up in primary care clinic after an acute visit in an urgent care setting	64 (90.1)	
Access and continuity summary score (0–4)		.70
4	41 (58.6)	
0–3	29 (41.4)	
Case management and care coordination		
Coordinates asthma care with appropriate community resources, such as school nurses	40 (56.3)	
Uses asthma nurses, educators, or lay workers to provide asthma case management	30 (43.5)	
Offers asthma education to primary care providers and nurses	36 (52.2)	
Facilitates allergy or pulmonology consultation for difficult asthma cases	57 (83.8)	
Provides self-management support through referral to a designated asthma nurse or educator	36 (51.4)	
Case management and care coordination summary score (0–5)		0.78
5	12 (18.2)	
3–4	27 (40.9)	
0–2	27 (40.9)	

* The Cronbach α for each scale provides a measure of reliability via inter-item correlation. Scores of .70 or more denote relatively high reliability.

as a child with persistent asthma not using daily anti-inflammatory medication. In this measure, persistent asthma was defined using National Asthma Education and Prevention Program criteria as having experienced symptoms 5 or more times in the past 2 weeks and having used inhaled β -agonist medication or inhaled anti-inflammatory medications 3 or more times per week in the

past 2 weeks. Daily anti-inflammatory medication use was defined as the parent's reporting during the follow-up telephone interview that the medication was used every day during the last 2 weeks. Preventive medication underprescribing was measured using computerized data and was defined as a child with persistent asthma receiving no anti-inflammatory medications dis-

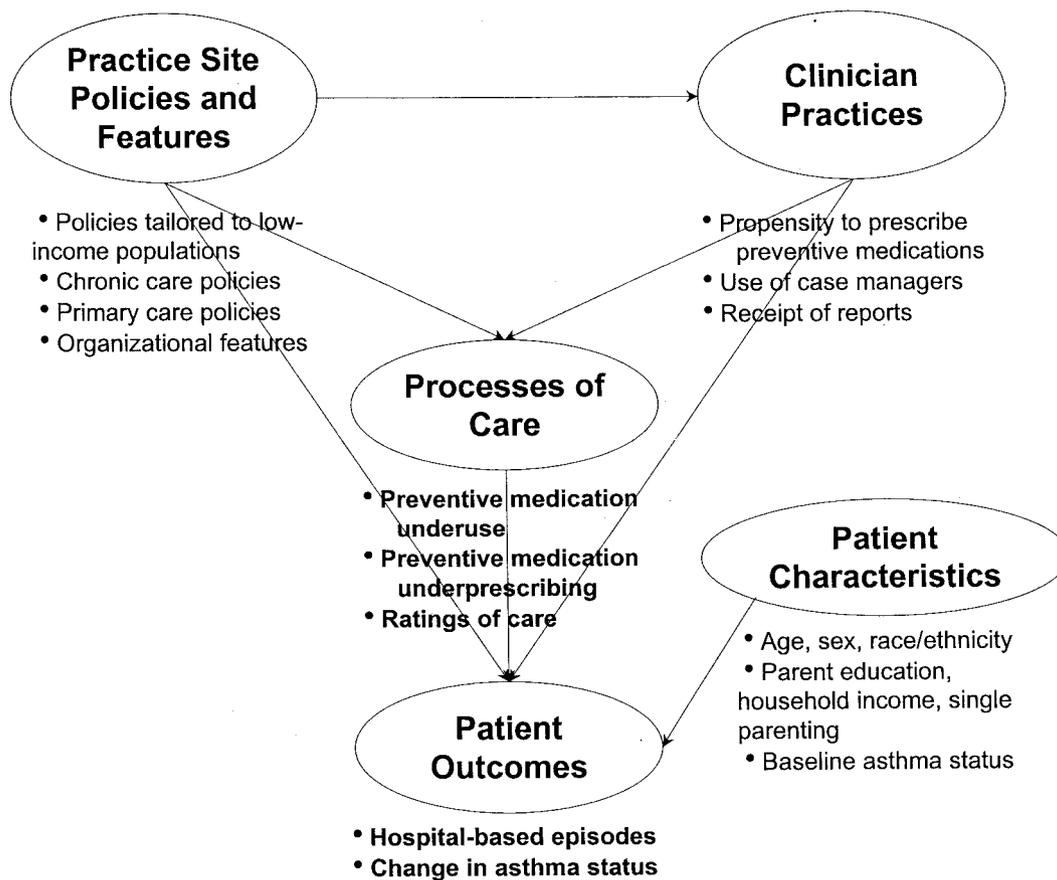


Fig 1. Conceptual model of factors that predict quality of care for Medicaid-insured children with asthma in the ACQA Project. The primary aim was to identify practice-site policies and clinician practices that predicted quality of care for asthma, after controlling for patient characteristics. The 5 quality measures were processes of care and patient outcomes (shown in bold).

pensed. In this measure, persistent asthma was defined as having 4 or more β -agonist dispensings during the follow-up year.

The following practice-site policies were identified as potentially important predictors in a priori hypotheses: cultural competence (composite score), support for continuity of care, use of reports to clinicians about asthma patients, and use of guidelines by clinicians. In addition, a priori hypotheses specified the following practice-site features as predictors of interest: percentage of patients with Medicaid, type of practice site (multispecialty group practice, academic health center, community health center, or solo or 2-person practice), size of practice group, and method of payment for specialty care (fee for service vs capitated).

Statistical Analysis

The multi-item measures for each policy in the practice site survey (eg, cultural competence) were refined using tests of inter-item correlation, principal component analysis, and factor analysis. Bivariate analyses to evaluate the association of each quality measure with each predictor included the χ^2 test for categorical variables and the Wilcoxon rank-sum test and Spearman correlation coefficient for ordinal or continuous variables.

In the first stage of multivariate analysis, we created a separate multivariate model that evaluated the association between each eligible predictor of interest and each quality measure while adjusting for demographics (age, gender, and race) and baseline asthma status (asthma physical status and medication dispensing). To be eligible for the first-stage multivariate analysis, a predictor variable had to be associated with the dependent variable at $P \leq .10$ in bivariate analysis or identified in the conceptual model's a priori hypotheses. Income, education, and employment were not significantly associated with quality measures in bivariate analyses and thus were not routinely included in models. In the final stage of modeling, we created iterative, forward-selection models for each quality measure. The final models sought to identify independent effects among predictor variables that were

significant at $P \leq .10$ in the first stage. Demographic and asthma status variables were forced into the final models.

Models used Poisson regression for rates (eg, hospital-based episodes), logistic regression for dichotomous variables (eg, preventive medication underuse), and linear regression for continuous variables (eg, asthma physical status). Parameter estimation, including regression coefficients and associated standard errors, was conducted using generalized estimating equation techniques to account for the fact that patients of a given clinician may be correlated and thus are not independent observations.¹⁶ Clustering of clinicians by practice site and practice sites by health plan was not included in the analysis. We limited our adjustment to clustering of patients by physician because a previous study suggested that within-physician correlation was likely to be stronger than within-facility correlation.¹⁷

RESULTS

Population Characteristics

At baseline, we completed interviews with 1663 parents (completion rate: 63%)^{18,19} and received surveys from 446 clinicians (78%) and 83 practice sites (100%). One-year follow-up interviews were completed with 1414 (85%) parents who were enrolled at baseline.

The study group was 38% black, 19% Latino, and 31% white (Table 2). Among the families, 53% had household incomes below the poverty level. Among the children, 67% had persistent asthma at baseline based on symptoms and/or medications reported by the parent. The hospitalization rate during the year

TABLE 2. Demographic Characteristics and Baseline Asthma Status of Children in the ACQA Project

	All Children* (N = 1663)
Demographic characteristics	
Age (y; mean [SD])	8.3 (3.9)
Male gender (n [%])	964 (58.0)
Race/ethnicity (n [%])	
Asian	42 (2.5)
Black	636 (38.2)
Latino	313 (18.8)
White	512 (30.8)
Other	155 (9.3)
Respondent's education (n [%])	
Less than high school	280 (17.0)
High school graduate	622 (37.7)
Some college or more	749 (45.4)
Family's income as % of poverty level (n [%])	
≤100%	798 (52.9)
>100–200%	476 (31.6)
>200%	234 (15.5)
Single-parent family (n [%])	690 (41.5)
Language spoken by adults at home (n [%])	
English	1446 (87.2)
Spanish	172 (10.4)
Other	41 (2.5)
Baseline asthma status	
Persistent asthma†	1111 (67.2)
Asthma physical score (mean [SD])‡	76.4 (20.7)
Symptom days in last 2-weeks (mean [SD])	7.1 (5.3)

* Includes children whose parents completed telephone interviews at baseline. The numbers of respondents and response rates by HMO were as follows: Kaiser Permanente, 456 (79%); Partnership Healthplan of California, 306 (61%); Group Health Cooperative of Puget Sound, 330 (63%); Harvard Pilgrim Health Care, 272 (60%); and Neighborhood Health Plan, 299 (52%).

† Persistent asthma was defined as 5 or more symptom days in the past 2 weeks or using β -agonists 3 or more times per week in the past 2 weeks or using anti-inflammatory medication daily during the past 2 weeks, based on parent report during the baseline interview.

‡ Scores are from the asthma physical status subscale of the Children's Health Status Assessment for Asthma.

before the baseline interview was 3.8, and the ED visit rate was 13.3 per 100 person-years of follow-up.

Clinicians and Practice Sites

Of the study clinicians, 49% were pediatricians and 40% were family practitioners. The Medicaid-predominant HMOs and the Washington State-based HMO had higher percentages of family practitioners than the other 2 HMOs. On average, clinicians in the study had 15 to 20 years of experience since medical school graduation; 48% were female.

Most practice sites in this study were multispecialty group practice or HMO centers (48%) or community health centers (31%). Practice sites varied widely in their proportions of patients insured by Medicaid and proportions of minority patients (Table 3).

Using factor analysis and measures of inter-item correlation, we developed 5 multi-item measures that described the care management policies of the practice sites (Table 1). The 5 measures evaluated cultural competence, reports to clinicians, self-management tools, access and continuity, and case man-

agement and care coordination. The final multi-item measures had Cronbach α ranging from .70 to .86, denoting high reliability based on inter-item correlation. The final cultural competence summary score included 6 items. On the basis of the results of principal component analysis, 3 additional items on communication-related practices (Table 1) did not fit with the others in the cultural competence score; each of these was treated as a separate predictor variable in analyses.

Practice sites varied widely in their policies to support cultural competence (Table 1). Although 71% reported recruiting ethnically diverse nurses and clinicians, only 23% offered training to clinicians to develop communication skills. Practice sites also varied widely in their use of reports to clinicians. Only 15% routinely provided clinicians with lists of asthma patients, although 30% gave feedback reports to clinicians to improve performance in care.

Policies Predictive of Asthma Care Quality

Quality Measures Based on Parent Report

Of the 729 children with persistent asthma by parent report, 65% were underusing preventive medications based on parent report of less-than-daily use. The mean rating of overall asthma care given by parents was 8.6 on a scale of 1 to 10, with a standard deviation of 1.9. Among all children, 17% experienced a decline of 0.5 or more standard deviations in their asthma physical status score between baseline and follow-up.

Table 4 shows the results of final multivariate models that simultaneously controlled for all significant predictors. Underuse of preventive asthma medications was lower among patients of practice sites with higher scores for cultural competence (odds ratio [OR]: 0.15 for the highest vs lowest scoring sites; 95% confidence interval [CI]: 0.06–0.41; Table 4). Preventive medication underuse was also less common among practice sites that had policies to promote access and continuity (OR: 0.56 for the highest-scoring sites vs all others; 95% CI: 0.34–0.93). These associations were identified in first-stage multivariate models that adjusted for demographics and baseline asthma status, as well as in the final multivariate model that evaluated both predictors simultaneously.

Parents' ratings of asthma care were higher among sites with higher cultural competence scores (Table 4). The highest versus lowest scoring practice sites had adjusted means of 9.1 versus 8.5 on a scale of 0 to 10 ($P = .02$). However, the pattern of association between cultural competence score and parent ratings was not linear. Parent ratings of care were also associated with the use of reports to providers in the final multivariate model. Two other practice-site policies—case management and coordination and the availability of disease management programs—were associated with parent ratings of care in first-stage models but were not significant in the final model. Asthma physical status at 1-year follow-up was associated with the practice site's issuing lists of asthma patients to clinicians, although the differ-

TABLE 3. Features of Practice Sites That Serve Medicaid-Insured Children in Five Managed Care Organizations in the ACQA Project

Features	All Practice Sites (N = 63; n [%])
Practice site type	
Multispecialty group practice or HMO	40 (48.2)
Single specialty group or solo practice	11 (13.3)
Community health center	26 (31.3)
Academic health center	5 (6.0)
Other or missing	1 (1.2)
Type of payment for specialty care	
Fee for service	29 (40.3)
Capitated	43 (59.7)
Estimated % of patients insured by Medicaid*	
<15%	17 (24.3)
15%–24%	26 (37.1)
>25%	27 (38.6)
Estimated % of patients who are US-born racial/ethnic minorities*	
<20%	28 (41.2)
20%–50%	25 (36.8)
>50%	15 (22.1)
No. of clinicians at practice site	
1–3	22 (26.5)
4–9	44 (53.0)
≥10	17 (20.5)

* Data on these and other variables in the table were collected via surveys of practice sites.

ences in adjusted means between sites that did and did not issue lists was small (81 vs 79; $P = .04$).

Quality Measures Based on Computerized Data

Of the 316 children with persistent asthma based on computerized data, 21% had medication underprescribing. The number of patients with persistent asthma based on computerized data was smaller than the number based on parent report because the computerized criterion was more stringent, likely resulting in a higher severity subgroup of children. The rate of hospital-based episodes was 11.0 per 100 person-years, including 2.7 hospitalizations and 9.5 ED visits.

Underprescribing of preventive medication based on computerized data was lower among practice sites that issued lists of asthma patients to clinicians (OR: 0.33; 95% CI: 0.16–0.69) and among clinicians who routinely gave written asthma management plans to families (OR: 0.27; 95% CI: 0.13–0.54; Table 4). Several other predictors were associated with less underprescribing of preventive medication in the first-stage models only. These included the use of self-management tools, policies to promote access and continuity, and the receipt of routine reports by the clinician.

Hospital-based episodes were associated with several predictors in first-stage models, but none of these predictors was significant in the final multivariate model (Table 4). In first-stage models, patients were less likely to have hospital-based episodes when their practice site-issued reports to clinicians or used self-management tools or when their clinician said that they were aware of disease management programs for asthma or received routine reports about their asthma patients.

In secondary analyses, adjusting for HMO did not change the magnitude of most of the observed associations, although selected findings became statisti-

cally less significant. In the secondary models, HMO was not independently associated with any quality measure except hospital-based episodes ($P = .0051$), for which the commercial HMOs had lower rates than Medicaid HMOs.

DISCUSSION

Major Findings

This study found that specific practice-site policies to promote care for low-income populations, chronic care, and primary care were associated with quality of care for Medicaid-insured children with asthma. Policies to support cultural competence, reports to clinicians, and access and continuity were independent predictors of quality after adjusting for patient demographics and baseline asthma status. In contrast, the structural features of practice sites, including size of practice group, type of practice (eg, multispecialty group or community health center), and percentage of patients insured by Medicaid were not independently associated with quality measures.

This work is unique in that we evaluated predictors of quality from the practice site, clinician, and patient levels simultaneously in multiple settings in 3 states. Previous studies have identified variables associated with asthma care processes or outcomes by measuring the characteristics of patients and clinicians.^{3,18,20–24} However, research that evaluates variables from practice sites or that combines variables from practice sites, clinicians, and patients is uncommon, perhaps because of the complexity of identifying the interrelationships among these entities, then collecting and linking data from multiple classes of respondents.

Practice-Site Policies

This study provides some of the strongest available evidence that policies to promote cultural com-

TABLE 4. Practice-Site and Clinician-Level Variables Predictive of Quality of Care Among Children With Asthma in Managed Medicaid: the ACQA Project

Quality Measure	Predictor Variable	Association in Final Model*					
		Unadjusted Outcome or %	% of Subgroup With Mean	OR or Adjusted Mean† or RR	95% CI	P	
Quality measures based on parent report Preventive medication underuse based on parent report, among children with persistent asthma (N in final model = 491; unadjusted % and OR)	Cultural competence policies of practice site (0–6 score)						
	5–6	43		0.15	(0.06–0.41)	.005	
	3–4	72		0.59	(0.23–1.50)		
	1–2	65		0.50	(0.20–1.24)		
	0	76		1.00	(1.00–1.00)		
	Access and continuity of practice site						
	4	64		0.56	(0.34–0.93)		
	0–3	73		1.00	(1.00–1.00)		
	Cultural competence policies of practice site (0–6 score)						
	5–6	9.07		9.08	(8.53–9.63)		.02
3–4	8.22		7.91	(7.38–8.44)			
1–2	8.70		8.96	(8.66–9.26)			
0	8.32		8.52	(7.94–9.10)			
Practice site issues reports to clinicians							
4	9.25		9.71	(9.20–10.22)			
3	8.63		8.28	(7.85–8.72)			
2	8.32		8.34	(7.57–9.10)			
1	8.68		8.48	(7.98–8.99)			
0	8.17		8.27	(7.94–8.60)			
Asthma physical status (N in final model = 1050; unadjusted and adjusted means)	Practice site issues lists of asthma patients to clinicians					.04	
	Always/usually	81.04		81.36	(80.02–82.70)		
	Sometimes/never	80.33		79.17	(77.49–80.84)		
Quality measures based on computerized data Preventive medication underprescribing based on computerized data, among children with persistent asthma§ (N in final model = 185; unadjusted % and OR)	Practice site issues reports to clinicians					.009	
	Always/usually	14		0.33	(0.16–0.69)		
	Sometimes/never	30		1.00	(1.00–1.00)		
	Clinician gives written asthma management plans to families						
	Always/usually	13		0.27	(0.13–0.54)		.002
	Sometimes/never	27		1.00	(1.00–1.00)		
	Practice site issues reports to clinicians						
	4	1		0.13	(0.02–0.86)		.13
	3	5		0.50	(0.24–1.06)		
	2	8		0.86	(0.33–2.26)		
1	10		0.61	(0.28–1.32)			
0	7		1.00	(1.00–1.00)			
Hospital-based episode¶ (N in final model = 1029; unadjusted % and RR)	Practice site issues reports to clinicians						
Yes	5		0.54	(0.26–1.13)	.08		
No	8		1.00	(1.00–1.00)			

RR indicates risk ratio.

* Associations with HMOs were not significant in for any of the quality measures except for hospital-based episodes, in which the association was significant at $P = .0051$.

† Means are the least square means from multivariate generalized estimating equation linear regression models, adjusting for demographics and asthma severity.

‡ In first-stage models, the parent's rating of care was also associated with the provision of case management and care coordination ($P = .04$) and the clinician's reporting that disease management programs for asthma were available ($P = .019$). First-stage models adjusted for demographics and asthma status but not for other practice site features.

§ In first-stage models, preventive medication underprescribing based on computerized data was also inversely associated with the practice site's use of self-management tools for families ($P = .0253$), the access and continuity of the practice site ($P = .009$), and the clinician's receiving routine reports about patients with asthma ($P = .043$).

¶ In first-stage models, hospital-based episodes were associated with the practice site's issuing reports to clinicians ($P = .015$) and the clinician's reporting that disease management programs for asthma were available ($P = .063$). In first-stage models, hospital-based episodes were also inversely associated with the practice site's use of self-management tools for families ($P = .025$) and the clinician's receiving routine reports about patients with asthma ($P = .043$).

petence are associated with quality of care. Cultural competence has received increasing attention in recent years, especially in managed Medicaid.^{25,26} Many studies suggest that cultural issues influence the effectiveness of health care.^{27–32} However, scant research exists on whether health care system efforts to promote cultural competence are effective or about which techniques are most useful.⁸ Our findings suggest that cultural competence policies are associated with specific aspects of health care quality in low-income populations and that this association deserves additional testing in interventional studies.

Among policies to support chronic care, reports to clinicians emerged as being associated with more appropriate medication prescribing, better parent ratings of care, and improved asthma physical status. Methods of reporting ranged from providing clinicians with lists of asthma patients to giving clinicians feedback reports to stimulate improvements in care or using prompts to enhance guideline adherence during individual patient encounters. The most simple of these methods—giving clinicians lists of their patients with asthma—was associated with 2 of the quality measures. This suggests that policies to improve chronic care do not need to be complex or highly technology dependent to be effective.

In the seminal description of primary care, access (first-contact care) and continuity (longitudinality) are 2 separate concepts.¹¹ These were combined as a single measure in our final analyses because in preliminary analyses, the items that measured these concepts were highly correlated and seemed to represent a single factor. Our findings that access and continuity were associated with better parent-reported use of preventive medications is in accordance with other studies suggesting that continuity of care is linked with desirable outcomes.^{33–37}

Other practice-site policies that were associated with quality measures in preliminary multivariate models included case management, support for self-management, and the use of written asthma management plans. These variables were not statistically significant in final models, but this in part might have been because these policies were highly correlated with other policies that accounted for more of the variation in quality. We interpret these results as suggesting that these policies are potentially useful, although the evidence was not as strong as that for other policies with independent effects in the final models.

Quality Measures

This study measured quality on the basis of both parent interviews and computerized data. Unsurprisingly, different practice-site policies were associated with different measures of quality. Among our quality measures, the process-based measures (preventive medication underuse and underprescribing, and parent ratings of care) seemed to be more sensitive indicators than the outcome-based measures (hospital-based episode rates and asthma physical status scores). Hospital-based episode rates were not significantly associated with any predictor variables in the final multivariate model and may be less mod-

ifiable by quality improvement efforts than other measures.

Limitations

Some of the policies that we attributed to practice sites may actually have represented or have been highly influenced by the policies of the health plans with which the practice sites were associated. For example, some of the health plans in this study routinely distributed reports to clinicians about their asthma patients. However, a preliminary study that we conducted suggests that there is often high variability in policies even among practice sites associated with the same health plan.³⁸ Because this study included only 5 health plans, we did not attempt to evaluate specific health plan features as predictors of quality. The children in this study were served by relatively mature and stable health plans, and these findings may not generalize to all managed Medicaid arrangements.

The observational design of this study precludes inferences that practice-site policies actually caused improvements in quality of care. The policies that we identified could be simply a marker for other, unstudied characteristics that actually caused the variation in quality. For example, practice sites with policies to promote cultural competence or reports to clinicians might also be better organized or more responsive to patients' needs in other ways that we did not evaluate. Another explanation of the association could be that practice sites that were already delivering high-quality care might have had the luxury of initiating activities such as cultural competence policies. Interventional studies are required to evaluate both the effectiveness of specific practice-site policies and the effectiveness of quality improvement programs that promote such policies.

Most variables in this study were collected via surveys of practice-site administrators, clinicians, and parents. Although nonresponse could affect the results, the response rate of 63% is considered excellent for a study of Medicaid patients.³⁹ The multi-item measure of cultural competence that we developed was based on questions derived from focus groups and existing literature. The measure was reliable on the basis of inter-item correlation and had construct validity in that it was associated with quality of care. Various other instruments have subsequently been developed to evaluate cultural competence, but limited data exist about their reliability and validity.²⁶ Additional development of standardized measures of cultural competence is warranted.

CONCLUSIONS

Practice-site policies to support cultural competence, reports to clinicians, and access and continuity of care are associated with higher-quality care for Medicaid-insured children with asthma. Efforts to improve care for this vulnerable group should focus on practice-site policies rather than on structural features such as practice-site size or organizational type.

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