

# Cost Saving and Quality of Care in a Pediatric Accountable Care Organization

Kelly J. Kelleher, MD, MPH<sup>a</sup>, Jennifer Cooper, PhD<sup>a</sup>, Katherine Deans, MD<sup>a</sup>, Pam Carr, RN<sup>b</sup>, Richard J. Brilli, MD<sup>a</sup>, Steven Allen, MD, MBA<sup>a</sup>, William Gardner, PhD<sup>c</sup>

## abstract

**BACKGROUND AND OBJECTIVES:** Accountable care organizations (ACOs) are responsible for costs and quality across a defined population. To succeed, the ACO must improve value by reducing costs while either maintaining or improving the quality of care. We examined changes from 2008 through 2013 in the cost and quality of care for Partners for Kids (PFK), a pediatric ACO serving an Ohio Medicaid population.

**METHODS:** We measured the historical cost of care for PFK and gathered comparison statewide Ohio Medicaid fee-for-service (FFS) and managed care (MC) cost histories. Changes in quality of care measures were assessed by using 15 Agency for Healthcare Research and Quality Pediatric Quality Indicators and 4 indicators targeted by PFK.

**RESULTS:** PFK per-member-per-month costs were lower in 2008 than either FFS or MC ( $P < .001$ ) costs and grew at a rate of \$2.40 per year compared with FFS increases of \$16.15 per year ( $P < .001$ ) and MC increases of \$6.47 per year ( $P < .121$ ) with ~3.5 million member-months each year. The quality of care of children in PFK improved significantly ( $P < .05$ ) in 2011–2013 versus 2008–2010 on 5 quality measures (including 2 composite measures) and declined significantly on 3 measures. Other measures did not change or were rare events with no measurable change.

**CONCLUSIONS:** PFK reduced the growth in costs compared with FFS Medicaid and averages less than MC Medicaid. This slowing in cost growth was achieved without diminishing the overall quality or outcomes of care. PFK thus improved the value of care for Medicaid children.

FREE

**WHAT'S KNOWN ON THIS SUBJECT:** Accountable care organizations are expanding. In pediatrics, however, there is no information on cost savings or quality generated by such organizations.

**WHAT THIS STUDY ADDS:** Partners for Kids is a pediatric accountable care organization that increased value for Medicaid children in 34 Ohio counties, primarily through cost savings. This slowing in cost growth was achieved without diminishing the overall quality or outcomes of care.

<sup>a</sup>Nationwide Children's Hospital and The Ohio State University, Columbus, Ohio; <sup>b</sup>Partners for Kids, Columbus, Ohio; and <sup>c</sup>Children's Hospital of Eastern Ontario, Ottawa, Ontario, Canada

Dr Kelleher participated in the conceptualization of the study, wrote the initial draft, and helped revise the text; Dr Cooper gathered data, analyzed data, and helped draft the text; Dr Deans participated in the conceptualization of the study, helped draft the text, and revised the text; Ms Carr helped obtain the data, conceptualized the article, and helped revise the text; Drs Brilli and Allen helped revise the text and participated in the conceptualization of the project; and Dr Gardner helped conceptualize the study, helped draft and revise the text, and analyzed data.

[www.pediatrics.org/cgi/doi/10.1542/peds.2014-2725](http://www.pediatrics.org/cgi/doi/10.1542/peds.2014-2725)

**DOI:** 10.1542/peds.2014-2725

Accepted for publication Dec 23, 2014

Address correspondence to Kelly J. Kelleher, MD, MPH, Center for Innovation in Pediatric Practice, 700 Children's Dr, JW4985, Columbus, OH 43205. E-mail: kelly.kelleher@nationwidechildrens.org

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2015 by the American Academy of Pediatrics

Accountable care organizations (ACOs) are growing in number and size because of advantages from the Patient Protection and Affordable Care Act,<sup>1</sup> early reports of savings generation, and dollars proffered by the Centers for Medicaid & Medicare Innovation. Derived in part from the early health maintenance organizations of the late 1970s and from accountable health plans in the Clinton administration's Health Security Act in the mid-1990s, ACOs apply the responsibility for costs and quality across a defined population to a network of providers who offer health and behavioral health services, with an increased emphasis on prevention and population health.<sup>2–5</sup> ACOs are integrated groups of clinicians and health care organizations with medical homes and care coordination that are contracted for specific patient lives and often bear some financial risk for reducing savings and improving health.

To succeed, the ACO must improve the value of care; that is, reduce the cost while either maintaining or improving quality. Specifically, ACOs contract with payers to assist in eliminating unnecessary expenses and improving quality. The ACO therefore focuses providers' attention on areas of health care delivery that are fragmented, inefficient, inconvenient for patients, or financially irrelevant for providers under the current fee-for-service (FFS) system.

Pediatric ACOs have 2 additional challenges not faced by adult ACOs. First, pediatric populations have proportionally fewer complex, high-cost patients, which means there are fewer targets for costs saving even though there are many quality improvement targets.<sup>6</sup> Second, most children are as healthy as they will ever be over the rest of their lives, which suggests fewer opportunities are available to improve health outcomes. However, because children

have many more years of life ahead compared with adults, cost savings and improvements in health and health care quality can have longer-lasting effects than in adults.<sup>7</sup> Thus, the comprehensive picture of benefits to children from a pediatric ACO may not be seen until many years later. Despite these challenges, pediatric ACOs have arisen in several states and regions in response to local market and regulatory conditions.

The critical question is whether adult or pediatric ACOs can increase the value of health care.<sup>8</sup> Medicare ACOs for the elderly are expanding rapidly, and there are no conclusive results available indicating their ability to reduce costs or broadly improve quality. A few pilot studies funded by the Centers for Medicare & Medicaid Services produced mixed results.<sup>9,10</sup> Although the question of value in pediatric ACOs is largely untested, at least 10 children's hospitals have partnered with physician networks in the past few years to take on risk-bearing contracts for various pediatric populations.

Partners for Kids (PFK), a physician/hospital organization in central and southeast Ohio, is the oldest and 1 of the largest exclusively pediatric ACOs in the United States. PFK has engaged in full financial and clinical risk for Medicaid enrollees aged 0 to 18 years for ~20 years and has embraced population health and integration strategies for the past 6 years. The present report describes that experience and the results related to increasing the value of care through cost reductions and improvement in quality measures over the past 6 years.

## METHODS

Nationwide Children's Hospital (NCH) in Columbus, Ohio, is a large academic medical center with >1 million patient-visits per year and 25 000 inpatient admissions.<sup>11</sup> In 1994, NCH partnered with community pediatricians to create PFK,

a physician/hospital organization with governance shared equally between NCH and representatives of physician primary and specialty practice groups. The majority of PFK physicians work under a salaried model as hospital or practice partners, whereas the remaining physicians are community practitioners. Nonemployed primary care physicians receive a percentage over the Medicaid fee schedule as quality-based incentive payments.

PFK was designed to address rising costs and concerns about the quality of care delivered to low-income patients. Since 2008, PFK has operated as a pediatric ACO, covering >300 000 low-income children in central and southeastern Ohio. Forty percent of the children live in Franklin County, the most urban county in the region, with the remainder spread throughout 33 other counties in Ohio, most of which are rural and many of them Appalachian. The children are evenly divided between boys and girls, with >95% enrolled through Ohio's Covered Families and Children eligibility category for poor children, and the remainder are covered under the Medicaid category of Aged, Blind, and Disabled. The latter group was recently added (after the period of current analysis) and therefore is not included in these analyses.

## Financial Model

Through a subcontracted arrangement with Ohio's 5 Medicaid managed care (MC) plans, PFK is paid an age- and gender-adjusted capitation fee for each child each month, which when averaged out, is the per-member per-month (PMPM) payment for care. PFK is then held responsible for managing and reimbursing providers for care. Although the MC organizations retain a percentage of the Medicaid premium to provide claims processing, member relations, and standard insurance management functions, PFK is considered an

intermediary organization by the Ohio Department of Insurance and has the business risk for clinical and financial outcomes. PFK also has the opportunity to retain savings if the care provided is less than the capitated amount.

## Design

The present observational study assessed the value of care provided by PFK from January 2008 through December 2013. The costs of care were compared with overall reported costs of Medicaid within the state of Ohio. Quality measures were derived from 2 sources: the Agency for Healthcare Research and Quality (AHRQ) set of Pediatric Quality Indicators<sup>12</sup> and PFK organizationally derived measures that were designed prospectively and targeted through local quality improvement initiatives.

## Cost Measures

The growth of PFK medical expenses were compared with State of Ohio Medicaid-reported medical expense increases for the years 2008 through 2013. PFK costs were calculated from the claims expense data. Ohio statewide Medicaid FFS and MC costs were derived from the Ohio Department of Medicaid Projected Medicaid Service Expenditures report.<sup>13</sup> The final (last quarter) FFS and MC costs for 2013 in this report are projected (ie, not actual).

## Quality Measures

Quality measurement for PFK is conducted primarily through claims data. The PFK claims database includes information on all billable medical care, procedures, and encounters for PFK enrollees. It allows for the tracking of patients over time, across treatment locations, and across both inpatient and outpatient encounters. Additional quality indicators are derived from the specialty care and data warehouse capacities at NCH that provide the majority of specialty services. The quality of care was

examined by using 2 groups of measures (Table 1).

### AHRQ Measures

Quality was measured in part by using the AHRQ set of Pediatric Quality Indicators.<sup>14</sup> We measured changes in these indicators to determine whether the quality of care declined as PFK looked for ways to reduce costs. The AHRQ measures were chosen because they: (1) have been shown to have face validity among pediatric experts and reliability in a nationally representative pediatric inpatient administrative database; (2) focus on potentially preventable complications and hospitalizations; (3) allow us to track system- and population-level changes over time; and (4) provide targets for interventions at both the provider and patient level.<sup>15</sup> These measures were not the subjects of targeted PFK quality improvement initiatives during the study period. Data were not yet available at the time of analysis to calculate the AHRQ measures for the last quarter of 2013.

### PFK Quality Targets

Four measures were the subject of targeted quality improvement efforts developed by the PFK board: (1) NICU days per 1000 member-months; (2) asthma emergency department visits per 1000 member-months; (3) rate of 3- to 6-year-old well-child checks; and (4) hemoglobin A1c (HbA1c) among children with diabetes cared for through NCH or their affiliated laboratories.

## Analysis

### Population Characteristics

To describe the demographic and socioeconomic characteristics of PFK members, the population of all children who were members of PFK for at least 1 month in 2008–2013 was examined. These characteristics included age, gender, and duration and continuity of enrollment in PFK. Standard family socioeconomic status indicators, such as parental education

level and household income, were not available in the PFK claims database. Therefore, zip code-level data obtained from the 2007–2011 American Community Survey 5-year estimates were applied.<sup>16</sup> These indicators included median household family income, percentage of the population ≥25 years of age with a bachelor's degree or higher, percentage of individuals living below the poverty level, percentage of children <5 years old living below the poverty level, and urban versus rural residence. To identify changes in patient characteristics over time, the demographic and socioeconomic characteristics of children in PFK during 2008–2010 were compared with those in PFK during 2011–2013.

### Cost Analysis

To determine whether PFK reduced the cost of care, ordinary least squares regressions were conducted to compare initial costs and rates of growth for PFK, Ohio Medicaid FFS, and Ohio Medicaid MC costs.

### Quality Analysis

Quality of care during 2011 to 2013 was analyzed by comparing measures during 2008–2010 with those during 2011–2013. For measures that counted events per 1000 member-months, Fisher's exact test was used. For measures calculated as monthly rates, *t* tests were used to compare the averages of the monthly rates during the 2 periods. All statistical analyses were performed by using SAS version 9.3 (SAS Institute, Inc, Cary, NC) or R version 3.0 ([www.r-project.org/](http://www.r-project.org/); R Foundation for Statistical Computing, Vienna, Austria). Two-sided *P* values <.05 were considered statistically significant.

## RESULTS

### Patient Demographic Characteristics

Table 2 presents data describing the PFK patient population in 2008–2010 and 2011–2013. Population

**TABLE 1** Definitions of Quality Measures

Measure	Definition
AHRQ measures <sup>a</sup>	
Accidental puncture or laceration rate	Accidental punctures or lacerations (secondary diagnosis) during procedure per 1000 discharges for patients aged $\leq 17$ y
Asthma admission rate	Hospital admissions with a principal diagnosis of asthma per 100 000 population aged 2 through 17 y
Central venous catheter–related bloodstream infection rate	Central venous catheter–related bloodstream infections (secondary diagnosis) per 1000 medical and surgical discharges for patients aged $\leq 17$ y
Diabetes short-term complications admission rate	Admissions for a principal diagnosis of diabetes with short-term complications (ketoacidosis, hyperosmolarity, or coma) per 100 000 population aged 6 through 17 y
Gastroenteritis admission rate	Admissions for a principal diagnosis of gastroenteritis or for a principal diagnosis of dehydration with a secondary diagnosis of gastroenteritis per 100 000 population, ages 3 mo to 17 y
Iatrogenic pneumothorax rate	Iatrogenic pneumothorax cases (secondary diagnosis) per 1000 discharges for patients aged $\leq 17$ y
Perioperative hemorrhage or hematoma rate	Perioperative hemorrhage or hematoma cases with control of perioperative hemorrhage, drainage of hematoma, or a miscellaneous hemorrhage- or hematoma-related procedure after surgery per 1000 surgical discharges for patients aged $\leq 17$ y
Postoperative respiratory failure rate	Postoperative respiratory failure (secondary diagnosis), mechanical ventilation, or reintubation cases per 1000 elective surgery discharges for patients aged $\leq 17$ y
Postoperative sepsis rate	Postoperative sepsis cases (secondary diagnosis) per 1000 surgery discharges for patients aged $\leq 17$ y. Includes metrics for discharges grouped according to risk category
Pressure ulcer rate	Stage III or IV pressure ulcers (secondary diagnosis) per 1000 discharges among patients aged $\leq 17$ y
Urinary tract infection admission rate	Admissions with a principal diagnosis of urinary tract infection per 100 000 population aged 3 mo to 17 y
Pediatric patient safety for selected indicators	The weighted average of the observed-to-expected ratios for: accidental puncture or laceration rate, pressure ulcer rate, iatrogenic pneumothorax rate, perioperative hemorrhage or hematoma rate, postoperative respiratory failure rate, postoperative sepsis rate, postoperative wound dehiscence rate, central venous catheter–related bloodstream infection rate
Pediatric quality acute composite	Composite of gastroenteritis or urinary tract infection per 100 000 population aged 6 to 17 y
Pediatric quality chronic composite	Composite of admissions for asthma or diabetes with short-term complications per 100 000 population aged 6 to 17 y
Pediatric quality overall composite	Discharges, for patients aged 6 to 17 y, that meet the inclusion and exclusion rules for any of the following: asthma admission rate, diabetes short-term complications admission rate, gastroenteritis admission rate, urinary tract infection admission rate
Targeted measures	
NICU days	NICU days per 1000 PFK member-months
Well-child visits	Well-child visits per 1000 PFK member-months for 3- to 6-year-olds
Asthma emergency department admissions	Averages of monthly asthma emergency department admissions per 1000 member-months
HbA1c levels	Monthly Median HbA1c levels for all known patients with diabetes mellitus who were aged $< 20$ y and followed up through a network laboratory where results were available

<sup>a</sup> AHRQ Definitions from AHRQ QI Version 4.5, Pediatric Quality Indicators ([www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)).

characteristics were similar between the 2 time periods.

### Costs

Figure 1 shows the comparison of the PMPM cost increases over the period from 2008 through 2013 for PFK, Medicaid FFS, and Medicaid MC. The analysis uses 2008 as the baseline year. During that year, PFK had \$108.53 PMPM costs on ~3.5 million member-months per year. FFS cost \$67.03 PMPM more than PFK ( $P < .001$ ) and MC cost \$23.75 more than PFK ( $P < .001$ ). Looking at cost

growth from 2008 forward, the PFK PMPM grew at a rate of \$2.40 per year, and MC grew at a rate of \$6.47 per year. This rate was not significantly greater than the cost growth rate of PFK ( $P < .121$ ). FFS grew at a rate of \$16.15 per year, significantly greater than the rate of growth in PFK ( $P < .001$ ).

### Quality

#### AHRQ Measures

Table 3 compares performance on the AHRQ indicators between 2008–2010 and 2011–2013. There was a modest

improvement in gastroenteritis admission rate, pediatric quality acute composite, and pediatric quality overall composite. Performance declined on diabetes short-term admission rates and perioperative hemorrhage or hematoma rates. There were no significant differences on the other 10 measures.

#### PFK Quality Targets

Improvements in the quality of care included a significant decrease in NICU days per 1000 PFK member-months and a significant increase in

**TABLE 2** Demographic Characteristics of PFK Population

Variable	2008–2010 <sup>a</sup> (N = 418 447)	2011–2013 <sup>a</sup> (N = 437 876)
Age, y <sup>b</sup>		
<1	17.5	14.8
1–4	23.4	23.1
5–12	36.6	38.5
13–17	22.5	23.6
Female gender	49.1	48.9
Rural <sup>c</sup>	33.1	32.3
Urban		
Rural	66.9	67.7
Median household income in zip code, \$ <sup>c</sup>	40 325 (36 250–48 182)	40 659 (36 418–49 731)
Percentage of adults ≥25 y old in zip code with a BS degree <sup>c</sup>	10.2 (7.6–15.5)	10.4 (7.7–15.5)
Percentage of subjects in zip code living below the poverty level <sup>c</sup>	19.2 (12.9–24.6)	18.8 (12.8–24.6)
Percentage of children aged <5 y in zip code living below the poverty level <sup>c</sup>	34.7 (21.0–44.1)	34.7 (21.0–44.1)
Enrollment continuity		
Continuous enrollment ≥24 mo, January 2008–September 2013	33.8	33.1
Continuous enrollment <24 mo, January 2008–September 2013	21.7	24.4
Discontinuous enrollment ≥24 mo, January 2008–September 2013	38.2	36.4
Discontinuous enrollment <24 mo, January 2008–September 2013	6.3	6.1
Enrollment breaks		
No break in enrollment while enrolled, January 2008–September 2013	55.5	57.5
1 break in enrollment while enrolled, January 2008–September 2013	28.0	26.9
>1 break in enrollment while enrolled, January 2008–September 2013	16.5	15.6

BS, bachelor of science.

<sup>a</sup> Percentages and medians (interquartile ranges) are shown and are based on all PFK members who were aged 0 to 17 years at any point during the entire study period and who were enrolled for at least 1 month during the particular period indicated.

<sup>b</sup> Age was determined as of July 1, 2009, and July 1, 2012, for the 2008–2010 and 2011–2013 time periods, respectively.

<sup>c</sup> Based on the child's zip code as of July 1, 2009, and July 1, 2012, for the 2008–2010 and 2011–2013 time periods, respectively. Zip code-level characteristics came from the 2007–2011 American Community Survey of the US Census Bureau. If a child was not covered by PFK on July 1, 2009, but was covered at some point during 2008–2010, the nearest date during 2008–2010 on which they were covered by PFK was used to determine these characteristics for the 2008–2010 period. If a child was not covered by PFK on July 1, 2012, but was covered at some point during 2011–2013, the nearest date during 2011–2013 on which they were covered by PFK was used to determine these characteristics for the 2011–2013 period.

the number of well-child visits per 1000 PFK members (Table 4). The average monthly median HbA1c value deteriorated, although this difference may not be clinically relevant.

## DISCUSSION

PFK successfully improved the value of pediatric health care over time, primarily through cost containment. We believe this is the first evaluation of a pediatric ACO, and our data demonstrate the potential for an ACO to minimize the growth in the cost of

care for a pediatric population compared with a state Medicaid FFS program (ie, Ohio).

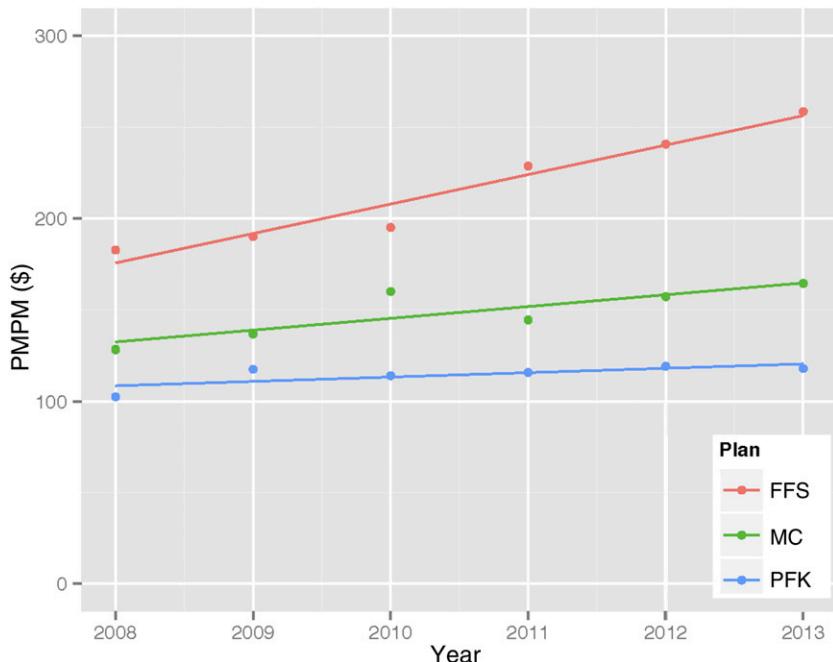
The lower rate of cost growth achieved by PFK bodes well for the short-term success of PFK's business model and other pediatric ACOs.

PFK's PMPM costs were consistently lower than those of other Ohio Medicaid MC organizations, with no overlap after 2008 in the confidence intervals surrounding the regression lines describing the growth. MC organization PMPM costs were higher than PFK and grew slightly faster

than PFK PMPMs, but the latter difference was not significant, possibly due to the relatively brief period of comparative years. Over 5 years, PFK experienced a 15.1% increase in PMPM. How would this finding compare with national measures of Medicaid cost growth? To our knowledge, there is no single national estimate of spending increases per child enrolled in Medicaid for these years. However, each indicator of cost growth that we could locate reflects higher growth than occurred at PFK. The Consumer Price Index for health care services increased 17.1% during the same years as our study, whereas overall Medicaid spending per enrollee has been estimated to have increased from 3% to 4% per year on average over the 5 years of our study, which would be 16% to 22% increases over 5 years.

Quality measures of PFK care remained generally stable over our study period. Although there were several modest improvements in AHRQ quality indicators, because these measures were not specifically targeted by PFK, it is unclear whether these improvements resulted from our organizational initiatives. The quality of care improved for NICU days per 1000 PFK members and well-child visits. The PFK board specifically targeted these measures, however. They were addressed directly by multidisciplinary and multi-institutional quality improvement teams and resulted in improved outcomes. In contrast, asthma emergency department visits and HbA1c values did not improve, with the latter showing a small but significant deterioration.

In summary, the PFK model substantially reduced growth in the cost of care relative to the growth experienced by other Ohio Medicaid enterprises serving children. At the same time, quality of care measures held steady, with a mix of several small improvements and minor



**FIGURE 1**

In 2008, FFS cost more than PFK ( $P < .001$ ) and MC cost more than PFK ( $P < .001$ ). The growth in FFS costs was faster than the growth for PFK ( $P < .001$ ). The difference between the MC organizations' cost growth and PFK growth was not significant ( $P < .121$ ).

deteriorations. Therefore, PFK delivered on the promise of the ACO to reduce the rate of health care cost growth while maintaining or improving the quality of care.

We suggest that the PFK model achieved these results because pediatric ACOs are better positioned to bridge coordination gaps in care than either an individualized

patient-centered medical home or an insurer could do alone; the ACOs are, in effect, the medical neighborhood for the medical home. Individualized medical practices are limited in their ability to track health care use across the system because their records reflect only visits to their individual practices or hospitals. Our recent data on quality of care for attention-

deficit/hyperactivity disorder underscore this issue.<sup>17</sup> In contrast, PFK manages care coordination, patient enrollment in digital communications and health record portals, coaching, and scheduling for many specialty pediatric patients area; it also provides pediatricians with report cards and follow-up data. Health plans are limited in their ability to influence practices and coordinate multiple quality initiatives because they invariably have only partial penetration of all children in the community. In Ohio, 5 different Medicaid MC organizations enroll pediatric members using different formularies, care guidelines, and care coordination models. For central and southeastern Ohio, PFK is able to provide a single set of provider guidelines for common conditions, a single set of collaborative activities for clinicians, and unified care coordination with pediatric specialty teams. As a physician/hospital organization, PFK is also more directly involved in the specialty care than a typical insurance company and can provide a unified voice on coordination and guidelines.

Although the low rate of medical inflation is important for sustainability, improvements in the value of health care should ideally be achieved by affecting both sides of the value equation. Value in health care can be achieved through improvements in quality as well as reductions in costs. It is disappointing that we did not identify a greater improvement in the quality of care. We believe there are several reasons for this outcome. First, the lack of widely accepted, clinically meaningful quality measures for pediatric ACOs limits the ability to demonstrate changes in quality. Second, the relative scarcity of many specialty pediatric conditions even in a population this size prevents reliable measurement of change in outcomes over time. Third, the AHRQ Pediatric Quality Indicators have serious limitations in terms of their

**TABLE 3** AHRQ Pediatric Quality Indicators: Comparison of 2008–2010 Versus 2011–2013

Quality Measure	Events/1000	Events/1000	<i>P</i>
	2008–2010	2011–2013	
Accidental puncture or laceration rate	0.46	0.38	.706
Asthma admission rate	0.44	0.43	.439
Central venous catheter-related bloodstream infection rate	0.17	0.21	.999
Diabetes short-term complications admission rate	0.13	0.15	.027
Gastroenteritis admission rate	0.16	0.11	.000
Iatrogenic pneumothorax rate	0.14	0.07	.442
Perioperative hemorrhage or hematoma rate	0.00	3.99	.048
Postoperative respiratory failure rate	7.71	5.02	.445
Postoperative sepsis rate	14.58	17.63	.695
Pressure ulcer rate	0.82	0.26	.359
Urinary tract infection admission rate	0.08	0.08	.326
Pediatric patient safety for selected indicators	1.39	1.44	.918
Pediatric quality acute composite	0.12	0.09	.018
Pediatric quality chronic composite	0.46	0.43	.288
Pediatric quality overall composite	0.58	0.53	.046

*P* values are results from Fisher's exact tests.

**TABLE 4** Quality of Care on Targeted Variables: Comparison of 2008–2010 Versus 2011–2013

Quality Measure	2008–2010	2011–2013	P
NICU days per 1000 PFK member-months	10.05	9.48	.000 <sup>a</sup>
Well-child visits per 1000 PFK member-months	575.98	583.75	.000 <sup>a</sup>
Asthma: averages of monthly admissions to ED per 1000 PFK member-months	2.53	2.23	.104 <sup>b</sup>
HbA1c: averages of monthly medians	8.38	8.51	.001 <sup>b</sup>

ED, emergency department.

<sup>a</sup> P value associated with Fisher's exact test.<sup>b</sup> P value associated with a t test.

ability to accurately measure preventable complications and admissions. In fact, a recent multicenter study recommended that they not be used as a comparative tool but rather as a screening tool to target more in-depth chart review.<sup>18</sup> In addition, the PFK claims database contains a limited number of diagnosis and procedure codes with which to calculate the AHRQ Pediatric Quality Indicators. Finally, the experience in PFK is that quality changes require more time than cost savings in a large network. PFK administrators and clinicians have been able to rapidly identify cost reduction targets such as rapid repeat admissions, inappropriate use of high-cost drugs or procedures, and patients in need of specialty care coordination that had not been detected by MC organizations without pediatric expertise. However, quality improvement activities require building large-scale clinician quality collaborative projects with external partner agencies, educating patients over time, launching shared quality improvement databases, tracking outcomes, and, often, new leadership. All of these activities are essential

infrastructure steps that should yield changes in quality outcomes over time, if they are sustained.<sup>5,19</sup> We plan to more robustly implement these infrastructure changes in PFK.

Although an additional 30 million Americans will have access to health coverage under the Patient Protection and Affordable Care Act, the difficult work of creating a system of better care, better health, and lower cost (what former Centers for Medicare & Medicaid Services administrator and pediatrician Don Berwick calls the "triple aim" of health care reform) will occur gradually. These reforms will come about through pilot projects designed to encourage innovation, increase effectiveness, and improve costs.

One of the primary vehicles through which the new law encourages such innovation is through provisions that establish ACOs in Medicare and, for pediatrics, in Medicaid/Children's Health Insurance Program. The fact that pediatric ACOs were singled out from adult ACOs in the legislation reflects 2 points. First, it shows an understanding that pediatric care is a critical intervention point where, as

a nation, we can shift from a culture of acute care to a culture of prevention in its most primary representation: children. Second, it reflects an appreciation for the different market forces in pediatric health care.<sup>8</sup>

Our results suggest that, at least for Medicaid, pediatric ACOs may be efficient models of reforming health care. At the same time, there are also challenges for improving pediatric quality of care and for measuring that quality. The National Committee for Quality Assurance is developing an accreditation and measurement proposal for ACOs, and PFK will be participating in its testing.

## CONCLUSIONS

NCH's PFK has demonstrated part of the vision behind pediatric ACOs by reducing costs while maintaining quality of care. PFK had many attributes working in its favor that contributed to the successful implementation of the ACO model, including an institutional emphasis on quality and safety outcomes,<sup>20,21</sup> strong partner Medicaid MC plans, a highly integrated network of pediatricians with strong market share, state Medicaid support, second- and third-generation technology, and a 120-year hospital history in the community. Many providers seeking to implement pediatric ACOs will have additional factors to contend with in their environment.

**FINANCIAL DISCLOSURE:** Dr Kelleher is an unremunerated member of the Board of Directors for Partners for Kids, the case study for this article. Ms Carr is the executive director of Partners for Kids and has a possible conflict of interest. The other authors have indicated they have no financial relationships relevant to this article to disclose.

**FUNDING:** Supported in part by Funding Opportunity Number CMS-1c1-12-0001 from the Centers for Medicare & Medicaid Services, Centers for Medicare & Medicaid Innovation. The contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of US Department of Health and Human Services or any of its agencies.

**POTENTIAL CONFLICT OF INTEREST:** Dr Kelleher is an unremunerated member of the Board of Directors for Partners for Kids, the case study for this article. Ms Carr is the executive director of Partners for Kids and has a possible conflict of interest. The other authors have indicated they have no potential conflicts of interest to disclose.

**COMPANION PAPER:** A companion to this article can be found on page e705, online at [www.pediatrics.org/cgi/doi/10.1542/peds.2014-3739](http://www.pediatrics.org/cgi/doi/10.1542/peds.2014-3739).

## REFERENCES

1. 111th US Congress. Patient Protection and Affordable Care Act; 2010
2. Gold M. Accountable care organizations: will they deliver? Available at: [www.mathematica-mpr.com/publications/pdfs/health/account\\_care\\_orgs\\_brief.pdf](http://www.mathematica-mpr.com/publications/pdfs/health/account_care_orgs_brief.pdf). Accessed August 21, 2014
3. Colla CH. Spending differences associated with the Medicare Physician Group Practice Demonstration. *JAMA*. 2012;308(10):1015–1023
4. Fisher ES, Shortell SM. Accountable care organizations: accountable for what, to whom, and how. *JAMA*. 2010;304(15):1715–1716
5. Kocot SL, Dang-Vu C, White R, McClellan M. Early experiences with accountable care in Medicaid: special challenges, big opportunities. *Popul Health Manag*. 2013;16(suppl 1):S4–S11
6. Chesney ML, Lindeke LL. Accountable care organizations: advocating for children and PNP within new models of care. *J Pediatr Health Care*. 2012;26(4):312–316
7. Gardner W, Kelleher K. A learning health care system for pediatrics. *JAMA Pediatr*. 2014;168(4):303–304
8. American Academy of Pediatrics. Accountable care organizations (ACOs) and pediatricians: evaluation and engagement. Available at: [www.aap.org/en-us/professional-resources/practice-support/Pages/Accountable-Care-Organizations-and-Pediatricians-Evaluation-and-Engagement.aspx](http://www.aap.org/en-us/professional-resources/practice-support/Pages/Accountable-Care-Organizations-and-Pediatricians-Evaluation-and-Engagement.aspx)
9. Colla CH, Lewis VA, Shortell SM, Fisher ES. First national survey of ACOs finds that physicians are playing strong leadership and ownership roles. *Health Aff (Millwood)*. 2014;33(6):964–971
10. Song Z, Safran DG, Landon BE, et al. Health care spending and quality in year 1 of the alternative quality contract. *N Engl J Med*. 2011;365(10):909–918
11. Makni N, Rothenburger A. Children's hospital-based accountable care: a national survey. In: *Children's Hospital Association Annual Leadership Conference*. Palm Desert, CA: Children's Hospital Association; 2014
12. Agency for Healthcare Research and Quality. Pediatric quality indicators overview. Available at: [www.qualityindicators.ahrq.gov/modules/pdi\\_overview.aspx](http://www.qualityindicators.ahrq.gov/modules/pdi_overview.aspx). Accessed August 9, 2014
13. Ohio Office of Medical Assistance. Ohio Department of Medicaid (MCD) projected Medicaid service expenditures report. Available at: [www.healthtransformation.ohio.gov/LinkClick.aspx?fileticket=KNT-2e69Bhs=&tstabid=136](http://www.healthtransformation.ohio.gov/LinkClick.aspx?fileticket=KNT-2e69Bhs=&tstabid=136). Accessed August 21, 2014
14. Agency for Healthcare Research and Quality. Pediatric Quality Indicators overview. Available at: [www.qualityindicators.ahrq.gov/Modules/pdi\\_resources.aspx](http://www.qualityindicators.ahrq.gov/Modules/pdi_resources.aspx). Accessed March 24, 2014
15. McDonald KM, Davies SM, Haberland CA, Geppert JJ, Ku A, Romano PS. Preliminary assessment of pediatric health care quality and patient safety in the United States using readily available administrative data. *Pediatrics*. 2008;122(2). Available at: [www.pediatrics.org/cgi/content/full/122/2/e416](http://www.pediatrics.org/cgi/content/full/122/2/e416)
16. United States Census Bureau. American community survey. Available at: [www.census.gov/acs/www/](http://www.census.gov/acs/www/). Accessed August 21, 2014
17. Epstein JN, Kelleher KJ, Baum R, et al. Variability in ADHD care in community-based pediatrics. *Pediatrics*. 2014;134(6):1136–1143
18. Scanlon MC, Harris JM 2nd, Levy F, Sedman A. Evaluation of the agency for healthcare research and quality pediatric quality indicators. *Pediatrics*. 2008;121(6). Available at: [www.pediatrics.org/cgi/content/full/121/6/e1723](http://www.pediatrics.org/cgi/content/full/121/6/e1723)
19. Iglesias JK. Assessing an ACO prototype—Medicare's Physician Group Practice demonstration. *N Engl J Med*. 2011;364(3):198–200
20. Brilli RJ, McClead RE Jr, Crandall WV, et al. A comprehensive patient safety program can significantly reduce preventable harm, associated costs, and hospital mortality. *J Pediatr*. 2013;163(6):1638–1645
21. Brilli RJ, Allen S, Davis JT. Revisiting the quality chasm. *Pediatrics*. 2014;133(5):763–765

## **Cost Saving and Quality of Care in a Pediatric Accountable Care Organization**

Kelly J. Kelleher, Jennifer Cooper, Katherine Deans, Pam Carr, Richard J. Brilli,

Steven Allen and William Gardner

*Pediatrics*; originally published online February 9, 2015;

DOI: 10.1542/peds.2014-2725

### **Updated Information & Services**

including high resolution figures, can be found at:  
<http://pediatrics.aappublications.org/content/early/2015/02/04/peds.2014-2725>

### **Subspecialty Collections**

This article, along with others on similar topics, appears in the following collection(s):

#### **For Your Benefit**

[http://pediatrics.aappublications.org/cgi/collection/for\\_your\\_benefit](http://pediatrics.aappublications.org/cgi/collection/for_your_benefit)

### **Permissions & Licensing**

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:  
<http://pediatrics.aappublications.org/site/misc/Permissions.xhtml>

### **Reprints**

Information about ordering reprints can be found online:  
<http://pediatrics.aappublications.org/site/misc/reprints.xhtml>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2015 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



# PEDIATRICS<sup>®</sup>

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## Cost Saving and Quality of Care in a Pediatric Accountable Care Organization

Kelly J. Kelleher, Jennifer Cooper, Katherine Deans, Pam Carr, Richard J. Brilli,  
Steven Allen and William Gardner

*Pediatrics*; originally published online February 9, 2015;  
DOI: 10.1542/peds.2014-2725

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/early/2015/02/04/peds.2014-2725>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2015 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

