Continuity of Care for Children in Foster Care

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ABSTRACT. Objective. To compare the continuity of care experienced by children who are in foster care with that of children who are not in foster care and are covered under Medicaid managed care and Medicaid fee-for-service (FFS).

Methods. This retrospective cohort study used Medicaid claims/encounter data from Washington state. A total of 903 children who were in foster care and continuously enrolled in Medicaid for 24 months (1998–1999) were matched by age, gender, and rural/urban residence to 903 Medicaid managed care enrollees and 903 FFS beneficiaries who were not in foster care. Indices of the continuity of primary care experienced were calculated for each patient, and differences in continuity among the cohorts were assessed by running 3 multiple linear regression models for all possible pairings of cohorts, controlling for age, gender, rural/urban residence, and total number of primary care visits.

Results. Foster care status was associated with decreased continuity of care relative to nonfoster managed care status ($\beta = -0.12; 95\%$ confidence interval [CI]: $-0.15$ to $-0.09$). Nonfoster FFS status was associated with lower continuity than managed care ($\beta = -0.09; 95\%$ CI: $-0.12$ to $-0.06$) and slightly higher continuity than foster care status ($\beta = 0.03; 95\%$ CI: $0.01$–$0.06$).

Conclusion. Although not dramatically different, continuity seems somewhat lacking for children in foster care. It is unclear to what degree the observed difference is confounded by the managed care/FFS distinction. As the enrollment of children in foster care into managed care plans has been controversial, efforts to promote the consistency of contact with providers while maintaining the flexibility afforded by FFS coverage seem warranted. Pediatrics 2003;111:e208–e213. URL: http://www.pediatrics.org/cgi/content/full/111/3/e208; foster home care, continuity of patient care, child, Medicaid.

ABBREVIATIONS. COC, continuity of care; FFS, fee-for-service.

The estimated number of children in relative and nonrelative foster family homes in the United States as of March 31, 2000, was roughly 430,000.1 The plight of these children as medically vulnerable, disproportionately high users of mental and health care services has been repeatedly described in the literature.2–23 Previous authors have characterized children in foster care as having been abused and neglected by biological parents,2,15,16,18 having lived in poverty,11,16,17,22 having a high prevalence of chronic conditions,5,6,11,14–16,18,21 and receiving inadequate health care services once in the foster care system.3,4,6,8,11,13,15,17,18,21,22

The medical and social needs of children in foster care have prompted the American Academy of Pediatrics to issue multiple calls for continuity of care (COC) for these children.23–25 There is a growing body of evidence that COC is associated with desirable outcomes in pediatric populations, including increased immunization rates, decreased emergency department and inpatient utilization, increased patient perceptions of quality, and decreased risk of elevated glucose levels in patients with diabetes.26–30

Studies of both children and adults have also shown benefits of continuity, including decreased emergency department utilization and hospitalization.31,32 In addition, a study of mother–infant dyads found continuity between prenatal and well-child care to be associated with higher immunization rates.33

Unfortunately, children in foster care are at increased risk for discontinuity of care because each change in foster care placement may be associated with a change in provider. It has been reported that the average length of stay in foster care is roughly 2 years, that roughly half of the children in foster care are subject to at least 1 change of placement, and that almost one-fifth move at least 3 times in an average of 10 months.6,16

To date, no studies have quantified the COC experienced by children in foster care relative to those not in the foster system. In the state of Washington, most children who are covered by Medicaid are enrolled in a managed care plan. A minority of children who are covered by Medicaid, including those in foster care and other children with special health care needs, are exempt from managed care and covered by a Medicaid fee-for-service (FFS) plan. Our objective was to compare the COC experienced by children who are in foster care with that experienced by children who are covered under traditional Medicaid managed care and Medicaid FFS. Our hypothesis was that children in foster care would have significantly lower COC.

METHODS

We used the state of Washington Medicaid claims (ie, FFS) and encounter (ie, managed care) data corresponding to calendar years 1998 and 1999. We required subjects to be continuously enrolled in Medicaid for the full 24-month study period. Of those continuously enrolled, we identified 903 children in foster care who were 2 to 19 years of age as of the last date of the study period.
in which a patient sees the same provider for every visit. Different providers for every visit and 1 corresponds to a situation in which a patient sees a different provider for every visit and 1 corresponds to a situation in which a patient sees the same provider for every visit.

Our index is thought to be the values most likely to represent primary care providers: physician/nurse practitioner/operating room technician/physician assistant/registered nurse and licensed practitioner (all of which were coded under the same value in the data), health department, health maintenance organization/managed care plan, and advanced registered nurse practitioner. Fourth, provider specialties were limited to general practice, family practice, obstetrics/gynecology, pediatrics, internal medicine, “clinic,” and “Federally Qualified Health Center.”

These subjects were eligible for Medicaid as children in foster care. For each of the 24 months and included those receiving supplemental security income payments and those eligible under Title IV-E. However, we did not include children who were receiving adoption assistance (ie, ongoing financial support for special care needs postadoption) as we did not want to combine children in foster care long-term with those who had ultimately been placed with adoptive parents. These determinations of Medicaid eligibility via specific foster care programs were made using codes available in the Medicaid eligibility files that identify underlying reasons for eligibility. No other data, such as data from a child welfare agency, were used in this analysis.

For comparison, the 903 children in foster care were matched by age (in years), gender, and a modification of a measure characterizing residence zip code into varying levels of urban/rural status (Rural Health Research Center www.fammed.washingтон.edu/wwwamirhc/) to: 1) 903 Medicaid beneficiaries enrolled in the state’s Medicaid managed care program, Healthy Options, who had at least 4 primary care visits during the study period and 2) 903 Medicaid beneficiaries who were not in foster care and were exempted from Healthy Options and covered by the traditional FFS program and had at least 4 primary care visits during the study period.

Although most of the children covered by Medicaid in Washington are automatically enrolled in Healthy Options, during the time frame of this study, exemptions were granted to children with special medical needs and to children who resided in areas where managed care coverage does not exist. Shortly after the study period, Washington state exempted all children in foster care from Healthy Options. Healthy Options beneficiaries may receive care provided by traditional FFS providers when services are unavailable through the managed care plan.

In calculating COC, we considered 1 visit per subject per provider per day. That is, multiple data records showing care provided by the same provider on the same day were counted as only 1 visit. In records in which the performing provider’s information was absent, the billing provider’s information was used. COC during the 2-year period was calculated using an established COC index described in detail elsewhere.28 The general form of this index is:

\[ \text{COC} = \frac{\sum_{j=1}^{s} n_j^2 - N}{N(N - 1)} \]

where \( N \) = total number of visits, \( n_j \) = number of visits to provider \( j \), and \( s \) = number of providers. The COC index ranges from 0 to 1, where 0 corresponds to a situation in which a patient sees a different provider for every visit and 1 corresponds to a situation in which a patient sees the same provider for every visit.

We examined differences in COC between 3 pairings of subject cohorts: 1) the foster care cohort versus the Healthy Options cohort, 2) the foster care cohort versus the nonfoster FFS cohort, and 3) the Healthy Options cohort versus the nonfoster FFS cohort. We used multiple linear regression models with the COC index as the dependent variable; a dummy variable for cohort membership as the independent variable; and age, gender, urban/rural categorizations, and total number of primary care visits during the study period as covariates. All analyses were conducted using SAS Version 8.02 (SAS Institute, Inc. Cary, NC).

**RESULTS**

Distributions of the demographic variables observed in the study sample are shown in Table 1. Overall, the 2709 subjects in the sample were 47% female with 79% residing in urban areas. The median age was 12 years with roughly one quarter of the subjects between ages 2 and 6 and another quarter between 16 and 19. These characteristics held true for each of the 3 cohorts because both the Healthy Options and the nonfoster FFS cohorts were created by matching subjects to the subjects in the foster cohort on the basis of age, gender, and urban/rural gradations.

There were a total of 25 053 primary care visits for the 2709 subjects in the sample, ranging from 4 to 85 visits per person (median: 7 visits per person). Among the foster cohort, visits ranged from 4 to 54 per person with a median of 7, whereas the Healthy Options cohort ranged from 4 to 62 with a median of 6. In the nonfoster FFS cohort, visits ranged from 4 to 85 with a median of 9. The top 3 reasons for receipt of primary care were consistent across cohorts, including routine infant/child health, upper respiratory infection, and otitis media, and accounted for roughly 15% to 18% of all primary care visits per cohort.

A total of 883 (98%) of the 903 subjects in the foster care cohort were never enrolled in Healthy Options at any time during the study period. Just 12 subjects were enrolled in Healthy Options for all 24 months, and 8 were enrolled between 1 and 6 months. It is interesting that all primary care visits for the 903 subjects in the foster cohort—including those of the few enrolled in managed care—were billed through the FFS system.

In general, the distributions of the COC index showed unimodal or slightly bimodal spreads with a spike at the end of the right-hand tail. In all 3 cohorts, the index ranged from 0.0 to 1.0, with an overall median of 0.38. The mean and median index values are summarized in Table 1.

**TABLE 1.** Demographic Attributes of Each of the 3 Study Cohorts

<table>
<thead>
<tr>
<th>Cohort size (no. of subjects)</th>
<th>903</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>47%</td>
</tr>
<tr>
<td>Male</td>
<td>53%</td>
</tr>
<tr>
<td>Age (y)</td>
<td></td>
</tr>
<tr>
<td>Minimum-maximum</td>
<td>2–19</td>
</tr>
<tr>
<td>Median</td>
<td>12</td>
</tr>
</tbody>
</table>

Urban/rural classification of census tract

<table>
<thead>
<tr>
<th>Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban core or strongly tied to urban core</td>
<td>79%</td>
</tr>
<tr>
<td>Weakly tied to urban core or large town</td>
<td>11%</td>
</tr>
<tr>
<td>or strongly tied to large town</td>
<td></td>
</tr>
<tr>
<td>Weakly tied to large town or small town</td>
<td>7%</td>
</tr>
<tr>
<td>or strongly tied to small town</td>
<td></td>
</tr>
<tr>
<td>Weakly tied to small town or isolated small rural</td>
<td>3%</td>
</tr>
</tbody>
</table>
TABLE 2. Regression Results of Independent Effects of Cohort Membership, Gender, Age, Urban/Rural Residence, and Total Number of Primary Care Visits on COC

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: Foster (Versus Healthy Options)</th>
<th>Model 2: Nonfoster FFS (Versus Foster)</th>
<th>Model 3: Nonfoster FFS (Versus Healthy Options)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort effect*</td>
<td>-0.12 (-0.15 to -0.09)</td>
<td>0.03 (0.01-0.06)</td>
<td>-0.09 (-0.12 to -0.06)</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural gradient 1† (Refrerent)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural gradient 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural gradient 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural gradient 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total visits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.04</td>
<td>0.02</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Data are statistically significant coefficients and 95% confidence intervals.

* Effect of membership in the cohort of interest versus the referent cohort. For example, the cohort effect in model 1 (second column) shows the average COC index for the foster cohort to be 0.12 lower than the average COC index for the Healthy Options cohort.

† Rural gradient 1 = least rural, rural gradient 4 = most rural.

Running 3 separate models allowed us to make pair-wise comparisons of every combination of 2 of the 3 cohorts. Table 2 shows the values of the statistically significant coefficient estimates for each of the models, along with the $R^2$ values.

Although the $R^2$ values were uniformly low, the data demonstrated a statistically significantly lower level of COC in both the foster and nonfoster FFS cohorts relative to Healthy Options. Controlling for age, gender, urban/rural residence, and total number of primary care visits, the average COC index of the foster care cohort was 0.12 lower than that of the Healthy Options cohort. Likewise, the average COC index of the nonfoster FFS cohort was estimated to be 0.09 lower than that of Healthy Options. The nonfoster FFS cohort was found to have significantly higher continuity than the foster cohort, although the magnitude of that difference (0.03) was much less than the difference between foster and Healthy Options.

DISCUSSION

We found that children in foster care for the long-term are apt to experience decreased COC relative to Medicaid managed care beneficiaries not in foster care. To obtain a better visualization of the observed differences, we created Table 3, which shows hypothetical sequences of visits and the corresponding COC values for 5 fabricated patients who each experienced 7 primary care visits (the median observed in this study) in a 24-month period. As shown in the table, as the visits become increasingly concentrated among fewer providers, the COC index values increase by roughly 0.10, a magnitude similar to that observed as the difference between the foster and Healthy Options cohorts. For example, patients 3 and 4 have COC indices that bound the overall median value of 0.38 observed in this study. Patient 3 has 7 visits spread among 3 providers, whereas patient 4 has 7 visits spread among 2 providers.

Although seemingly small, the magnitude of the observed difference could be large enough to be clinically meaningful. In previous studies, Christakis et al.28 showed that outcomes vary by tertile of the COC index. For example, in a study of the risk for emergency department visits, the middle tertile (COC index values: 0.19–0.40) showed a statistically significant hazard ratio of 1.28 (95% confidence interval: 1.20–1.36) relative to the highest tertile (COC index values: 0.41–1.00), ie, as continuity increased, risk for an untoward outcome decreased. In our current study, median foster and Healthy Options COC indices of 0.31 and 0.47, respectively, straddled the cutoff point between the middle and high tertiles of that previous study. It might be reasonable to expect that subtly lower levels of COC may be potentially more problematic for children with special health care needs than for healthy children.

The results of our study must be interpreted with the following limitations in mind. First, requiring our subjects to have 2 years of continuous Medicaid enrollment may have yielded a sample that is not representative of all children in foster care. It was noted in the introduction that an estimate of the average length of stay in foster care is 2 years. However, many children move between the homes of their

TABLE 3. Example Visit Sequences and COC Indices for 5 Hypothetical Patients Each With 7 Primary Care Visits

<table>
<thead>
<tr>
<th>Hypothetical Patient</th>
<th>No. of Visits to Provider A</th>
<th>No. of Visits to Provider B</th>
<th>No. of Visits to Provider C</th>
<th>No. of Visits to Provider D</th>
<th>Example Sequence of Visits</th>
<th>COC Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>ABABCCD</td>
<td>0.14</td>
</tr>
<tr>
<td>Patient 2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>AABABCC</td>
<td>0.24</td>
</tr>
<tr>
<td>Patient 3</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>AAAAAABC</td>
<td>0.33</td>
</tr>
<tr>
<td>Patient 4</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>AABAAABB</td>
<td>0.43</td>
</tr>
<tr>
<td>Patient 5</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>AABABAB</td>
<td>0.52</td>
</tr>
</tbody>
</table>
birth parents and foster parents on much shorter time frames. From an analysis perspective, it is difficult to study COC in situations in which insurance coverage is not continuous, whereby continuity is difficult to achieve in the first place. Thus, we chose to study children in foster care for longer periods of time knowing that our results most likely would not reflect the experience of children who move in and out of foster placements at a much higher frequency.

Second, our study was conducted in a single state and only compared children in foster care with other children covered by Medicaid. It is possible that the COC experienced by privately insured individuals may differ from that of Medicaid beneficiaries and that a comparison between privately insured individuals and children in foster care would yield a different conclusion as to the adequacy of COC for this population. Third, we did not have access to data from other agencies participating in the foster care system, such as child welfare services, and could not analyze important aspects of the foster care experience such as placement stability.

Our results could be confounded by 2 phenomena: 1) differences in the type of care sought by each cohort and 2) the role of managed care. Although the Washington state exemption from mandatory managed care enrollment did not take effect until after this study period, the majority of children in the foster cohort were never enrolled in managed care during the study period. This could have been attributable either to the presence of special health care needs or the unavailability of managed care services in the areas in which the children in foster care resided. Given that almost 80% of each cohort resided in or near an urban core, the latter reason is less likely. There was some indication that the primary care received by each cohort was similar. Even so, if the children in the foster cohort essentially represented a cohort of children with special needs whereas the Healthy Options cohort represented children without special needs, then these underlying differences in health status could have independently affected the provision and receipt of primary care. The actual direction of that effect is unclear. All else being equal, one might expect higher COC for children with special needs as a result of factors such as elevated concern among medical providers and placement in foster homes with more extensively trained foster parents.

It is also unclear to what degree the observed difference in COC between the foster cohort and the Healthy Options cohort is a function of fundamental differences in the provision of care between the FFS and managed care delivery systems and not a reflection of the different experiences based on foster care status, per se. One might expect COC naturally to be higher in a managed care, gatekeeper-based system. We did see that the third cohort of FFS beneficiaries not in foster care exhibited significantly lower continuity than the Healthy Options cohort. However, this cohort also exhibited significantly higher continuity than the foster cohort, although the magnitude of this difference was even smaller than the difference between the foster and Healthy Options cohorts.

Some have argued in favor of managed care as a potential solution to providing more effective management of the health care needs of children in foster care. However, others have raised concerns with managed care and have even decried managed care for children in foster care, arguing that capitation rates and restricted access to specialists do not adequately reflect the special needs of children in foster care, therefore preventing them from receiving all of the services that they require. Acknowledging the emerging dominance of managed care in the health care sector, Batistelli outlined strategies for child welfare agencies to pursue in managed care contracting to ensure adequate care for children in foster care, including higher capitation rates, elimination of patient cost sharing, extensive and/or specially tailored benefit packages, relaxed prior-approval requirements, and monitoring of plan performance. In the state of Washington, the decision was made to exempt children in foster care from managed care because it was believed that the complex problems faced by these children were not well suited to a managed care environment.

We believe that our results lay the foundation for additional health services research in this area. To understand better the COC experience of children in foster care for shorter time spells, it could be useful to study a cohort of children continuously enrolled in Medicaid for some extended period of time, say 24 months, who were placed in foster care for some but not all of those 24 months. It would be fruitful to examine the relationship between the COC experienced by children in foster care as it relates to health care outcomes. In addition, if it were possible to obtain linked Medicaid–child welfare services data, then it could be possible to study COC as a function of foster placement stability.

From a programmatic standpoint, efforts to promote the consistency of contact with providers while maintaining the flexibility afforded by FFS coverage seem warranted. Previous efforts in other locations have revolved around 2 basic concepts: 1) establishing centralized foster care specialty clinics and 2) creating a medical “passport” that contains summary medical history information and accompanies a given child in foster care moving through a series of providers.

Related to the former is the concept of medical homes for children with special health care needs. In regard to foster care specifically, foster care specialty clinics have not been widely adopted. Anecdotally, this could be attributable to practical impediments such as foster parents’ resistance to the idea of being forced to travel to centralized, designated foster care clinics and being asked to use providers other than those with whom they may have formed relationships for other children in their care.

Related to the concept of medical passports, several authors have advocated a streamlined flow of patient information in general. Part of the impetus for this is similar to a basis for the argument in

http://www.pediatrics.org/cgi/content/full/111/3/e208
favor of centralized clinics, ie, given the special needs of children in foster care spanning an array of clinical domains, it is improbable to achieve COC of a single child by a single provider.6 In the past, passports have been conceived of and implemented as hard-copy summary sheets—containing information on past diagnoses, medications, and providers seen—that are brought to visits by foster parents.7,11,22

In 1993, Lindsay et al18 reported on the development of a computerized passport system for children in foster care. In 2000, Simms et al22 suggested that systems that are more effective than hard-copy passports might be developed on computerized platforms. With the advancement of secure web-based technologies, it should be possible to explore online access to passport-level information further, thereby experimenting with the notion of establishing “virtual continuity” for children in foster care that could readily transfer information across providers and eliminate the need for foster parents to update and remember to carry paper forms. Researchers internationally have begun to examine the use of web-based technologies as a means of improving continuity.39–41 These pilot projects have sought to demonstrate the ability to combine information from multiple settings and information systems and distribute the information securely.39,40

The challenge of developing an acceptably secure and usable system should not be understated, however. Because the problem being addressed is that of providers needing rapid access to the medical information of patients who “roam” from provider to provider, the system would need to allow all Medicaid providers access to the records of any given child in foster care. In addition, one could ultimately imagine joining medical providers and child welfare providers through the same system, which adds even more complexity. Despite the hurdles, for an administratively self-contained yet geographically and clinically disparate population such as children in a state’s foster care system, such technologies could prove to be an effective means of improving care.

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REFERENCES


