

## Does continuity of care improve patient outcomes?

Michael D. Cabana, MD, MPH, and Sandra H. Jee, MD, MPH

Child Health Evaluation and Research Unit, Division of General Pediatrics,  
University of Michigan Health System, Ann Arbor, Mich

### Practice recommendations

- Sustained continuity of care (SCOC) improves quality of care, by decreasing hospitalizations, decreasing emergency department use, and improving receipt of preventive services (SOR: **B**, based primarily on cohort studies).
- SCOC has been consistently documented to improve quality of care for patients with chronic conditions such as asthma and diabetes (SOR: **B**, primarily on cohort studies).

### Abstract

**Objective** Continuity of care is a cornerstone of primary care that has been promoted by recent trends in medical education and in the way health care delivery is organized. We sought to determine the effect of sustained continuity of care (SCOC) on the quality of patient care.

**Data sources** We conducted a systematic review of all articles in Medline (January, 1966 to January, 2002), Educational Resources Information Center (ERIC), and PSYCH INFO using the terms "continuity of care" or "continuity of patient care."

*Corresponding author: Michael D. Cabana, MD, MPH, 6-D-19 NIB, Box 0456, 300 North Ingalls Street, Ann Arbor, MI 48109-0456. E-mail: mcabana@med.umich.edu*

We identified additional titles of candidate articles by reviewing the bibliographies of articles from our original MEDLINE search, contacting experts in primary care, health care management, and health services research, and by reviewing bibliographies of textbooks of primary care and public health.

**Study selection and data extraction** Two investigators (MDC, SHJ) independently reviewed the full text to exclude articles that did not fulfill search criteria. Articles excluded were those that focused on physicians-in-training, on SCOC in a non-primary care setting, such as an inpatient ward, or on transitions from inpatient to the outpatient setting. We also excluded articles that did not correlate SCOC to a quality of care measure.

**Data synthesis** From 5070 candidate titles, we examined the full text of 260 articles and found 18 (12 cross-sectional studies, 5 cohort studies and 1 randomized controlled trial) that fulfilled our criteria. Five studies focused on patients with chronic illness (eg, asthma, diabetes).

**Results** No studies documented negative effects of increased SCOC on quality of care. SCOC is associated with patient satisfaction (4 studies), decreased hospitalizations and emergency department visits (7 studies), and improved receipt of preventive services (5 studies).

**Conclusions** SCOC improves quality of care, and this association is consistently documented for patients with chronic conditions. Programs to promote SCOC may best maximize impact by focusing on populations with chronic conditions.

Continuity of care (COC) has been promoted recently by such trends as the concept of the "medical home" for patients, use of gatekeepers in managed care organizations (MCOs), and "continuity clinics" for residency training.<sup>1-4</sup> In assessing quality of care provided by MCOs, COC is indirectly measured through physician turnover rate.<sup>5</sup> In addition, many states have enacted laws to guarantee patients' rights to continue seeing their physician, when a physician's contract with a MCO has been terminated.<sup>6</sup>

Continuity refers to "care over time by a single individual or team of health care professionals and to effective and timely communication of health information."<sup>7</sup> Previous work distinguishes continuity from longitudinality. *Continuity* refers to whether a patient sees the same clinician from one visit to the next. *Longitudinality* refers to whether the patient has an established, long-term relationship with a clinician.<sup>8</sup> The term *continuity* is often used when actually describing *longitudinality*.

In this analysis, we distinguish between the 2 concepts and focus on the *sustained continuity of care between a patient and a health care provider through a relationship over time*. Since this focus most closely resembles the concept of longitudinality, we will distinguish this from COC as *sustained continuity of care* (SCOC).

SCOC may encourage communication between physician and patient throughout the course of a long-term relationship. As health care providers gain familiarity with a patient's history, they may more effectively manage chronic conditions or monitor long-term development.

The advantage of SCOC lessens, however, as electronic medical information becomes more prevalent, allowing different providers to stay up to date on long-term issues. There are tradeoffs, too, with SCOC, such as not being able to see the next available provider in an urgent situation.<sup>9</sup> Also, one provider voices one perspective or opinion; access to multiple perspectives can serve as a "check" for avoiding incorrect or delayed diagnoses.<sup>10</sup> Providers with different expertise<sup>11</sup> may

be able to complement others' skills and thus provide better services overall.<sup>12</sup> Furthermore, SCOC could decrease communication if physicians or patients assume they know (or are known by) the other so well that new issues are not introduced or discussed.

Given these tradeoffs, it is not surprising that different studies suggest conflicting results regarding SCOC and quality.<sup>13-15</sup> Although Dietrich et al previously reviewed this topic, the following analysis incorporates new studies published since the previous analysis.<sup>16</sup>

## ■ METHODS

### Data sources

We conducted a systematic review to identify studies examining the relationship between SCOC and quality of care. We searched articles limited to the English language and human subjects, published from January 1, 1966, to January 1, 2002, using Medline, the Educational Resources Information Center (ERIC) and PSYCH INFO. Candidate articles were those with titles containing the medical subject heading (MeSH) descriptors "continuity of patient care" or "continuity of care."

Additional titles were found in the bibliographies of articles accepted in our original search, through experts in primary care, health care management, and research, and in the bibliographies of relevant textbooks.

### Data selection

Two investigators (MDC, SHJ) screened titles and full bibliographic citations to identify candidate articles. We excluded letters, editorials, and practice guidelines. We accepted randomized controlled trials (RCT), cross-sectional, case-control, and cohort studies.

We excluded articles in which a significant percentage of providers were physicians in training. Our focus was SCOC in the outpatient setting; we excluded articles that analyzed inpatient or chronic care facility settings, or transitions to or from an outpatient setting (eg,

As health care providers gain familiarity with a patient's history, they may better manage chronic conditions

post-hospitalization discharge care).

In many RCTs, implementation of SCOC was part of a multifaceted intervention (eg, multidisciplinary clinic and home care).<sup>17,18</sup> Although these studies examined quality of care, the effect of SCOC was indistinguishable from that of broader intervention. If the effect of SCOC could not be distinguished, we excluded the study. Finally, we excluded articles that did not measure SCOC in relation to a quality of care endpoint or a cost of care endpoint, defined below.

#### Quality-of-care and cost endpoints for analysis

The definition of quality of care was based on a framework described by Donabedian.<sup>19</sup> *Structure* is part of this framework for quality and includes resources (such as buildings, equipment, staff) available to provide health care that may or not promote SCOC. Since SCOC itself is a product of structure, we did not include structure in our analysis.

We defined 4 possible endpoints: process of care, outcomes, satisfaction, and cost of care. *Process of care* refers to differences in the delivery of care or differences in the receipt of care by patients. *Outcome* is any change in the health status of a patient. *Satisfaction* is an individual's (eg, patient, caregiver, or provider) emotional or cognitive evaluation of the structure, process, or outcome of health care.<sup>20</sup> *Cost of care* encompasses direct and indirect costs to patient, payer, and society.

#### Determination of SCOC

Though there is no standard method to determine SCOC, we accepted only studies that fulfilled the criteria below.

The method had to (i) *measure SCOC at the provider-level*. We did not use a site-based meas-

ure, since it is possible for a patient to visit the same clinic multiple times and see different providers.

The method had to (ii) *determine SCOC over a time frame longer than one visit*. We did not include studies that used "did you see the physician at the last visit?" as a method for determining SCOC. Although this fulfills definition for *continuity* used in other studies,<sup>8</sup> the purpose of the current analysis was to examine the effect of SCOC (ie, longitudinality) on quality.

The method had to (iii) *be applied consistently to all patients*. We did not accept studies that used "number of physicians seen" if the study did not standardize the observation period. Patients observed for longer periods would likely have seen more physicians in general, and have been at greater risk for lower SCOC, than would patients observed for shorter periods. Since it is not clear if the SCOC measure would be consistently applied, a study using this type of measure was excluded.

Finally, the method had to (iv) *account for the possibility of more than one provider during the observed time period*. We did not include studies that used "duration of time that the patient has seen the provider" as a measure of SCOC. Theoretically, any number of other providers could have seen the patient during this time and affected the SCOC.

Two investigators (MDC, SHJ) independently reviewed the full text to exclude articles not fulfilling criteria. Differences were resolved by informal consensus. We calculated a kappa score to measure the degree of agreement in the selection process.

#### Data extraction and analysis

We abstracted study design, location, population, method to calculate SCOC, and the association of SCOC with a study endpoint. We grouped articles in relation to endpoint measured. Simple counts and descriptive statistics of the articles were calculated. If 2 articles used data from the same study, we used the more recent article.

## ■ RESULTS

### Search yield

We found 5087 candidate titles in our original search. We excluded 4891 titles after examination of the bibliographic citation, which left 196 articles. After examining the full text of these remaining articles, 18 fulfilled our criteria (**Table 1**, available online at [www.jfponline.com](http://www.jfponline.com)). The kappa to measure the preconsensus inter-rater reliability for article selection was 0.93.

### Study designs

Of the 18 articles in the final analysis, 12 (67%) were cross-sectional studies,<sup>21-32</sup> five (28%) were cohort studies,<sup>33-37</sup> and one (6%) was an RCT.<sup>38</sup> In the RCT, subjects were elderly men enrolled in a Veteran's Administration outpatient clinic. Subjects randomized to the "discontinuity" group had a 33% chance of being scheduled with a different provider at each visit and were also scheduled with a different provider if they had seen the same provider for the previous 2 visits. Subjects in the "continuity" group were scheduled to see the same provider routinely.<sup>38</sup>

### Study populations, providers, and settings

Fifteen of the 18 studies (83%) were conducted in the United States. Ten studies (56%) focused on specific groups of patients: those insured by Medicaid (n=4), adults with diabetes (n=2), multiethnic women, elderly men, adults with seizure disorder, children with chronic diseases, and children and adults with asthma (n=1 each).

Health care providers in these studies included different primary care specialties, such as family medicine (n=4), pediatrics (n=4), general practice (n=2), internal medicine (n=1), and mixed primary care physicians (n=5). One study included pediatric subspecialists. In 5, the SCOC was described for the patient's "regular physician."

### Methods used to measure SCOC

**Table 2** (available online at [www.jfponline.com](http://www.jfponline.com)) displays the different methods and data sources used to determine SCOC. Data sources included

No studies documented any negative effects of increased sustained continuity of care on quality of care

medical records (n=3), medical claims data (n=5), and surveys (n=10). One study calculated SCOC separately using both medical records and a patient survey.<sup>22</sup>

Six of the methods used formulas to account for different combinations of factors, such as number of visits, dispersion of providers, and number of visits to a particular provider (see **Appendix**, available online at [www.jfponline.com](http://www.jfponline.com)). There were 8 different methods to determine SCOC based on survey responses, ranging from single item questions<sup>24,32</sup> to a 23-item perception of continuity scale.<sup>22</sup>

### Associations between SCOC and quality or cost of care

Overall, we found no studies documenting any negative effects of increased SCOC on quality or care. Due to the heterogeneity of methods to calculate SCOC and endpoints, we were unable to combine results.

**Costs.** Two cross-sectional studies examined factors associated with cost of care (**Table 1**). Increased SCOC measured by the usual provider continuity (UPC) index correlated with increased provider or MCO cost of care ( $P<.05$ ); however, the results were not significant when SCOC was measured using other indices.<sup>22</sup> Another study found that increased SCOC was associated with decreased total annual health care expenditures.<sup>23</sup>

**Satisfaction.** Although we could not pool results of studies due to heterogeneity, there is a consistent association between SCOC and patient satisfaction, based on the results of 4 studies (**Table 1**).

Three cross-sectional studies in different settings<sup>21,22,31</sup> found a positive association between increased SCOC and patient satisfaction. However, all 3 studies used subjective methods to determine SCOC. One study that used quantitative

## Increased sustained continuity of care heightens patient satisfaction and improves receipt of preventive services

methods to measure SCOC (ie, COC index, UPC scale) did not find a statistically significant association with patient satisfaction.<sup>22</sup> One RCT found no effect on satisfaction with patient-provider interaction overall ( $P>.05$ ).<sup>38</sup>

**Patient outcomes.** The effect of SCOC seems consistent across studies for patients with chronic conditions who were hospitalized or visited emergency departments (Table 1).

In one RCT, the continuity group had fewer hospital days (5.7 vs. 9.1,  $P=.02$ ); fewer intensive care days (0.4 vs. 1.4,  $P=.01$ ); shorter hospital length of stay (15.5 vs. 25.5,  $P=.008$ ); and lower percentages of emergent hospitalization (20% vs 39%,  $P=.002$ ) compared with the discontinuity group. Of note, the subjects were all elderly men, of whom 47% had cardiovascular disease and 18% had respiratory disease.<sup>38</sup>

In 2 cross-sectional and 4 cohort studies, SCOC led to decreased hospitalizations and emergency department use, and to some improvements in preventive health behavior. Half of the studies focused on patients with chronic conditions (asthma or diabetes).<sup>33,34,37</sup> Medicaid claims data analyses suggest that higher SCOC is associated with decreased likelihood of making single and multiple emergency department visits, hospitalizations overall, and hospitalizations for chronic conditions.<sup>26,36</sup> However, higher SCOC did not decrease the risk of hospitalization for acute ambulatory care sensitive conditions (eg, gastroenteritis).<sup>36</sup>

**Process of care.** For preventive services, 5 cross-sectional studies found that increased SCOC improved receipt of preventive services (Table 1).<sup>24,28-30,32,33,35</sup>

Two cross-sectional studies examined the association between SCOC and patient-provider communication.<sup>25,27</sup> One study found that increased SCOC improved communication and patient per-

ception regarding the ability to influence treatment.<sup>27</sup> One study on epilepsy care found greater patient ease in talking to the physician.<sup>25</sup>

One RCT found no differences in scheduled or unscheduled clinic visits, specialty referrals, or receipt of preventive care procedures such as blood pressure measurement, weight assessment, or assessment of smoking status ( $P>.05$ ).<sup>38</sup>

## DISCUSSION

Increased SCOC has not had any negative effects on quality of care. Indeed, in many cases, increased SCOC heightens patient satisfaction, decreases hospitalizations and emergency department visits, and improves receipt of preventive services. The positive effect of SCOC on health care use has been well documented for patients with chronic conditions. Although our search strategy and exclusion criteria differed from a previous review by Dietrich et al, we report similar conclusions regarding SCOC and patient satisfaction.<sup>16</sup>

We observed that the association between SCOC and quality of care appears most consistent for patients with chronic conditions, and we think there are several reasons for this relationship. Improved care should evolve throughout the course of a long-term relationship. The time frame of most studies in our analysis was limited, with the longest being only 2 years. It is possible that the benefits of SCOC do not become manifest until a much longer time period or after many visits with the same primary care provider.

However, patients with chronic disease are more likely to use outpatient, emergency department, and hospital services than are otherwise healthy persons. The increased number of outpatient visits by a patient with chronic disease may establish SCOC more quickly in a relationship, compared with patients who have fewer outpatient visits in general. The increased frequency of emergency department use and hospitalizations for patients with chronic disease may also magnify the effects and benefits of SCOC. As a result, it may be easier to detect the positive effects of SCOC for patients with chronic disease.

Finally, low SCOC may simply be a marker for other factors (associated with the patient or health care system) that are linked to decreased quality of care or increased costs.

### Limitations

Because this review included only published articles, it is susceptible to publication bias.<sup>40</sup> We included only studies that looked at the effect of SCOC on quality of care, and excluded studies that considered SCOC as part of a larger intervention. It is not clear if this under- or overestimates the effect of SCOC. However, by including only such studies, we are underreporting the overall evidence base of the effect of SCOC on quality of care.

Benefits of SCOC may occur if a patient develops a consistent relationship with a specific clinic or practice site. Since we limited our analysis to the provider-level, our results might not reflect the benefits of SCOC in broader contexts.

Although SCOC has many positive effects on quality of care, absolute or complete SCOC may not necessarily be ideal. There may be tradeoffs between SCOC and patient access to care. One study suggested that in certain scenarios (ie, "minor problems"), convenience was more important than SCOC; however for chronic issues, SCOC was more valued.<sup>39</sup> Although this analysis suggests that SCOC is associated with improved quality of care, it is beyond the scope of this study to suggest the ideal level of SCOC in relation to other factors such as access. The published studies in this analysis were not designed to address these issues.

Finally, patient satisfaction may not be an appropriate measure for quality in this particular analysis. Patients who are dissatisfied with care may be more likely to change physicians and thus have less continuity. However, in this analysis we examined quality-of-care endpoints separately from other endpoints.

### Implications and future research

Based on our study criteria, our analysis suggests an association between SCOC and patient satis-

Patients who are dissatisfied with care may be more likely to change physicians and have less continuity

faction, as well as improved process of care and patient outcomes.

Other areas remain to be investigated. We found few studies, for example, that examined the impact of SCOC on cost of care. Programs that attempt to maximize SCOC may require significant administrative resources and costs (ie, to improve scheduling or provider availability). In an era of limited resources, promoting increased investment in this area may necessitate a demonstration of the long-term financial effects of SCOC and the absence of any unintended consequences (eg, delays in diagnosis). Although there are specific expenditures associated with promoting SCOC, such changes should theoretically lower health care costs overall by decreasing avoidable hospitalizations or emergency department visits.

Future research should investigate which populations benefit most from SCOC. A significant portion of the evidence for the positive effects of SCOC on quality of care includes patients with chronic disease, such as asthma and diabetes. Programs or clinics with limited resources to promote SCOC may be able to maximize impact by focusing on such populations.

### ACKNOWLEDGEMENTS

*Presented in part at the Pediatric Academic Societies Annual Meeting, Seattle, Wash. May 6, 2003. Support (SHJ) provided by the National Institute of Child Health and Human Development T32 HD07534-03. The authors would like to thank Ms. Lucy M. Schiller and Ms. Kathryn L. Wheeler for their assistance in data collection, as well Ms. Kathryn Slisk for her editorial assistance.*

### CONFLICTS OF INTEREST

*The authors have no conflicts of interest to report.*

### REFERENCES

1. Starfield B. *Primary Care: Concept, Evaluation and Policy*. New York, NY: Oxford University Press; 1998.

2. American Academy of Pediatrics. The Medical Home: Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children. *Pediatrics* 2002; 110:184-186.
3. Hunt CE, Kallenberg GA, Whitcomb ME. Trends in clinical education of medical students. *Arch Pediatr Adol Med* 1999; 153:297-302.
4. Halm EA, Causino N, Blumenthal D. Is gatekeeping better than traditional care? A survey of physicians' attitudes. *JAMA* 1997; 278:1677-1681.
5. National Committee for Quality Assurance. *HEDIS 2003*, Volume 2. Washington, DC: National Committee for Quality Assurance, 2003: Health Plan Stability, pp. 151-158.
6. Guglielmo WJ. Mandated continuity of care: a solution in search of a problem? *Med Econ* December 1999. pp. 45-52.
7. Institute of Medicine. *Primary Care: America's Health in a New Era*. Washington, DC: National Academy Press; 1996.
8. Starfield B. Continuous confusions? *Am J Pub Health* 1980; 70:120.
9. Love MM, Mainous AG. Commitment to a regular physician: how long will patients wait to see their own physician for acute illness? *J Fam Pract* 1999; 48:202-207.
10. Freeman G, Hjortdahl P. What future for continuity of care in general practice? *BMJ* 1997; 314:1870.
11. Schroeder SA. Primary care at the crossroads. *Acad Med* 2002; 77:767-773.
12. Gallagher TC, Geling O, Comite F. Use of multiple providers for regular care and women's receipt of hormone replacement therapy counseling. *Med Care* 2001; 39:1086-1096.
13. Christakis D. Consistent contact with a physician improves outcomes. *West J Med* 2001; 175:4.
14. Wachter RM. Discontinuity can improve patient care. *West J Med* 2001; 175:5.
15. Freeman G. What is the future for continuity of care in general practice? *BMJ* 1997; 314:1870.
16. Dietrich AJ, Marton KI. Does continuous care from a physician make a difference? *J Fam Pract* 1982; 15:929-937.
17. Becker MH, Drachman RH, Kirscht JP. A field experiment to evaluate various outcomes of continuity of physician care. *Am J Pub Health* 1974; 64:1062-1070.
18. Katz S, Vignos PJ, Moskowitz RW, Thompson HM, Svec KH. Comprehensive outpatient care in rheumatoid arthritis. *JAMA* 1968; 206:1249-1254.
19. Donabedian A. Evaluating the quality of medical care. *Milbank Quarterly* 1966; 44:166.
20. Campbell SM, Roland MO, Buetow S. Defining quality of care. *Soc Sci Med* 2000; 51:1611-1625.
21. Breslau N, Mortimer EA. Seeing the same doctor: determinants of satisfaction with specialty care for disabled children. *Med Care* 1981; 19:741-758.
22. Chao J. Continuity of care: incorporating patient perceptions. *Fam Med* 1988; 20:333-337.
23. Connelius LJ. The degree of usual provider continuity for African and Latino Americans. *J Health Care Poor Underserved* 1997; 8:170-185.
24. Ettner SL. The relationship between continuity of care and the health behaviors of patients: does having a usual physician make a difference? *Med Care* 1999; 37:547-555.
25. Freeman GK, Richards SC. Personal continuity and the care of patients with epilepsy in general practice. *Brit J Gen Pract* 1994; 44:395-399.
26. Gill JM, Mainous AG, Nsereko M. The effect of continuity of care on emergency department use. *Arch Fam Med* 2000; 9:333-338.
27. Love MM, Mainous AG, Talbert JC, Hager GL. Continuity of care and the physician-patient relationship. *J Fam Pract* 2000; 49:998-1004.
28. O'Malley AS, Forrest CB. Continuity of care and delivery of ambulatory services to children in community health clinics. *J Comm Health* 1996; 21:159-173.
29. O'Malley AS, Mandelblatt J, Gold K, Cagney KA, Kerner J. Continuity of care and the use of breast and cervical cancer screening services in a multiethnic community. *Arch Intern Med* 1997; 157:1462-1470.
30. Strumberg JP, Schattner P. Personal doctoring: its impact on continuity of care as measured by the comprehensiveness of care score. *Austral Fam Physician* 2001; 30:513-518.
31. Weiss GL, Ramsey CA. Regular source of primary medical care and patient satisfaction. *QRB* 1989; 180-184.
32. Lambrew JM, DeFriesse GH, Carey TS, Ricketts TC, Biddle AK. The effects of having a regular doctor on access to primary care. *Med Care* 1996; 34:138-151.
33. Christakis DA, Feudtner C, Pihoker C, Connell FA. Continuity and quality of care for children with diabetes who are covered by Medicaid. *Amb Peds* 2001; 1:99-103.
34. Christakis DA, Mell L, Koepsell TD, Zimmerman FJ, Connell FA. Association of lower continuity of care with greater risk of emergency department use and hospitalization in children. *Peds* 2001; 103:524-529.
35. Christakis DA, Mell L, Wright JA, Davis R, Connell FA. The association between greater continuity of care and timely measure-mumps-rubella vaccination. *Am J Pub Health* 2000; 90:962-965.
36. Gill JM, Mainous AG. The role of provider continuity in preventing hospitalizations. *Arch Fam Med* 1998; 7:352-357.
37. Parchman ML, Pugh JA, Noel PH, Larne AC. Continuity of care, self-management behaviors, and glucose control in patients with type 2 diabetes. *Med Care* 2002; 40:137-144.
38. Wasson JH, Sauvigne AE, Mogielnicki P, et al. Continuity of outpatient medical care in elderly men. *JAMA* 1984; 252:2413-2417.
39. Kearley KE, Freeman GK, Health A. An exploration of the value of the personal doctor-patient relationship in general practice. *Brit J Gen Pract* 2001; 51:712-718.
40. Begg CB, Berlin JA. Publication bias: a problem in interpreting medical data. *J R Stat Soc* 1988; 151:419-463.

## FOR OUR AUTHORS

Beginning in January 2005, the *Journal of Family Practice* will begin accepting manuscript submissions online for our Applied Evidence, Original Research, and other articles. Potential authors are directed to our website:  
<http://mc.manuscriptcentral.com/jfp>.  
 New authors will need to create a login. Please direct any questions about this to the managing editor at Paul.Rieder@dowdenhealth.com.