

Practice Management

Decreased Continuity in a Residency Clinic: A Consequence of Open Access Scheduling

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Background and Objectives: *Open access scheduling decreases waiting time to see physicians by using same-day appointment scheduling. In primary care residency training, continuity of care may be difficult to preserve with this method of scheduling because requirements for rotations often results in residents being unavailable in their primary clinic practice. Our objective was to examine continuity of care in a family medicine residency clinic during a 1-year period prior to implementation of open-access scheduling and during a 1-year period after open access scheduling started. **Methods:** Two indices to measure continuity were used: the Usual Provider Continuity Index (UPC) and the Modified Modified Continuity Index (MMCI). The Mann-Whitney test was used to determine differences in the UPC and MMCI between groups. **Results:** The mean UPC and MMCI scores decreased with open access scheduling. Mean UPC was 0.59 with traditional scheduling versus 0.55 with open access scheduling. Mean MMCI was 0.51 for traditional scheduling and 0.44 with open access. **Conclusions:** Continuity of care decreased in our clinic after implementation of open access scheduling. Our results have implications for all primary care residency training programs since one of the hallmarks of primary care is maintaining continuity in the physician-patient relationship.*

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Continuity of care, a sustained partnership between patients and clinicians, is an important characteristic of primary care. In response to the Institute of Medicine's 2001 *Crossing the Quality Chasm* report that portrays the fragmentation of the US health care system, the American Academy of Family Physicians^{1,2} in its Future of Family Medicine report emphasized continuity of care with the concept of a personal medical home.¹⁻³ The ambulatory setting of primary care allows for patients to return "home" to the same physician regularly for acute, chronic, and preventive medical services.

Studies on continuity of care consistently associate patient and physician satisfaction with higher levels of continuity.⁴⁻⁶ Improved health outcomes, including reduced numbers and duration of hospitalizations, improved medication compliance, increased health maintenance, and increased immunization rates, and fewer sick visits have been reported with increased continuity between physician and patients.⁷⁻¹¹ Other studies, however, found no improvement in the number of hospitalizations and emergency room visits or in

chronic disease management, particularly for diabetes, epilepsy, and hypertension.⁹⁻¹⁴

While continuity is not important to all patients, it is valued more by women, those with less education, those with Medicare or Medicaid coverage, patients who require multiple medications daily, and patients who report lower health status.^{6,8} One study found that continuity of care ranked third in patient priority after having a doctor that listens and having a doctor that explains problems well.²

Open access scheduling offers a way to improve continuity in primary care. In open access scheduling, patients make same-day appointments regardless of the type of problem or visit required. Open access scheduling provides care to patients at the time they need it, rather than at a future scheduled appointment. Provider schedules are left open with minimal pre-bookings to allow adequate capacity to meet demand for appointments. Open access scheduling contrasts with traditional scheduling, which oversaturates physicians' schedules and creates a backlog of patients waiting to be seen (Table 1).^{15,18}

Primary care training programs are using open access scheduling, but the effects on continuity of care have not been studied. In the private practice set-

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Table 1
Open Access Scheduling Versus Traditional Scheduling¹⁵⁻¹⁷

<i>Traditional Scheduling</i>	<i>Open Access Scheduling</i>
Patients call to schedule appointment and are offered next available—usually days to weeks from time of call.	Patients call to schedule appointment and are offered same-day appointment.
Timeliness is poor with long waiting times to see physician (average 55 days).	Timeliness is good—no waiting time to appointments.
Less than 10% of appointment slots are left open on given work day.	More than 65% of appointments are left open. Booked appointments reserved for elderly or those needing to notify jobs.
Appointment types include nonurgent and urgent.	One appointment type—“do today’s work today” paradigm
Urgent appointments lead to double booking into physician’s schedule.	Urgent appointments scheduled the same as regular office visit. Time left over dedicated to follow-up of preventive issues.
Triage system between nursing and scheduling staff to determine urgency and need for appointment.	Eliminates triage system since appointment times are available for all types of visits.
Continuity disrupted because primary care physician’s schedule full. Patient has to see available physician.	Continuity preserved since primary care physician has daily open appointments.
No-show rates frequent—patients forget about appointments scheduled too far in advance or if urgent matter, they get health care addressed at emergency rooms or urgent care.	No-show rates decrease—appointments are made for the same day as phone call. Patients less likely to forget, and urgent issues can be addressed promptly.
Patients frustrated with lack of continuity and accessibility to medical care.	Increased patient satisfaction because of timely visits and able to see their regular primary care physician.

ting, continuity of care has demonstrated variability. One study showed an improvement.²¹ Other studies showed no change or showed a decline in continuity that contributed to decreased physician and patient satisfaction.^{18,23,24}

We report here a study to examine continuity of care with open access scheduling compared to traditional scheduling in a community-based family medicine residency clinic. Despite the reported advantages of decreased no-show rates and reduced waiting time to appointments with open access scheduling,²¹⁻²⁴ we hypothesized that with implementation of open access scheduling in our residency clinic, continuity would decrease. Our rationale for this hypothesis was that when patients call for same-day appointments, patients’ primary providers (ie, residents and faculty) would frequently be unavailable due to their part-time presence in clinic because of off-site rotations and administrative duties.

Methods

Setting

This study was conducted at the Family Medicine Center (FMC). This clinic is the ambulatory site for the Banner Good Samaritan Family Medicine Residency program located in downtown Phoenix. The Banner Health System’s institutional review board granted an exemption to formal review of the study methods.

The FMC serves an urban population. There are 32 physicians—24 residents and eight faculty members. During each half-day session, there is variability in the number of physicians seeing patients. There generally

are three to nine physicians, a combination of both faculty and residents, working during each half-day clinic session. The clinic has about 12,000 patient visits per year.

Implementation of Open Access Scheduling

Prior to July 2003, the clinic used traditional scheduling. When patients called for an appointment, attempts were made to schedule them with their primary provider. Personnel at the scheduling desk had a schedule indicating physicians’ availability in clinic and could inform patients when the patient’s primary physician would be available. If the patient’s primary physician was not in clinic on the day for which the patient requested an appointment, the patient had the option of scheduling the visit with another physician who would be available at the desired date and time. Appointments could be scheduled up to 3 months in advance.

We implemented open access scheduling starting in July 2003. By December 2003, the transition to open access scheduling was complete, with the clinic seeing approximately the same number of patients daily as before implementation of open access scheduling.

With open access scheduling, patients call on the same day or within 24 hours before the day they want to be seen for a visit. Scheduling personnel ask patients for the name of their primary physician (faculty or resident). If the physician is in clinic at the time the patient desires an appointment, the patient is scheduled to see that physician. If the provider is not available, the patients are asked if seeing another doctor is acceptable or if they would like to wait until their primary provider is

in clinic. The schedulers have access to the physicians' schedules and can inform patients about what day and what time to call to make the appointment with the primary care provider.

Booking an appointment before the 24-hour time limit is referred to as pre-booking. Pre-booking is only done for adult well visits and prenatal visits. To stay true with the concept of open access scheduling, pre-bookings are limited. The majority of time, the provider starts off with a completely open schedule. The maximum number of patients that can be pre-booked with a given physician is two patients per half-day session. The number of open appointments varies by resident and faculty. First-year residents have four appointment times per half-day session, while third-year residents and faculty have up to 10 openings per half-day session. Faculty have 2 half days of clinic per week. Second- and third-year residents are in clinic on average of 4 half days per week, while interns are in clinic 1 half day per week.

Data Collection

We collected data for all patient visits that occurred during traditional scheduling during a 1-year period from January 1, 2001, to December 31, 2001, and then from a 1-year period after open access was established, from January 1, 2004, to December 31, 2004. The number of patient visits and the provider seen during the studied time periods were obtained from our computer billing and scheduling system, SOURCE 2000. Visits recognized in the computer scheduling system were verified with the patient's billing history to confirm that the number of visits correlated with the services charged. If discrepancy was noted between the scheduling and the billing programs, the patient was excluded from the study.

All patient visits that occurred during the aforementioned time periods were included unless they met our two exclusion criterion. Specifically, we excluded patients who were seen in the clinic fewer than three times during the study time or, as noted, if there was a discrepancy between the patient scheduling history and billing cycle. Patients with less than three visits during the study period were excluded. Calculation of continuity indices in patients with two visits would create large disparities in the calculated results—either the patient had zero for a continuity score or one, and the concept of continuity is meaningless with only one visit.

Measures

Numerous ways to measure continuity of care exist. We chose two previously published indices: the Usual Provider Continuity Index (UPC) and the Modified Modified Continuity Index (MMCI).^{19,20} The UPC is the ratio of the number of visits to the most frequently seen provider to the total number of visits to all providers.¹⁹ The formula for the MMCI is: $([1 - (n \text{ of providers} / \{n \text{ of visits} + 0.1\})] / [1 - (1 / \{n \text{ of visits} + 0.1\})])$.²⁰

The UPC index is more simple to understand but takes into account only the ratio of visits to the predominant provider. It does not reflect the total number of physicians seen. The MMCI, on the other hand, corrects for the degree of dispersion among different providers. Continuity scores for both indices range between 0 (if every visit is with a different provider) and 1 (if all visits are with the same provider). The two indices chosen (UPC and MMCI) were used in other studies measuring continuity in a residency setting.^{19,20,22,24,25}

Data Analysis

The UPC and the MMCI were calculated for all patients included in the study. Five variables (the number of visits to usual provider, the total number of visits, the number of providers seen, the UPC, and the MMCI) were reported as means and standard deviations. Categorical variables (age group, gender, and insurance) were reported as percentages.

The Mann-Whitney test was used to determine differences in UPC and MMCI scores between groups because the data were not normally distributed. A two-tailed $P < .05$ was considered significant.

Results

Subject Demographics

Of 2,208 patients seen at the FMC during traditional scheduling, 475 were included in the study. Of 2,418 patients seen during open access scheduling, 375 were included in the study. The remainder of patients were excluded because they had fewer than three visits during the respective study times. Table 2 compares the demographic information of patients seen during the times studied. The majority of patient visits during both scheduling formats were in the age group of 13–30, closely followed by the age group of 41–64. In both study groups, there was a female predominance in number of patient visits.

Inter-group Comparison of Continuity Indices

The mean UPC and MMCI were both lower during open access scheduling than during traditional scheduling (Table 3). The mean UPC was 0.561 with traditional scheduling versus 0.535 with open access scheduling ($P = .13$). Mean MMCI was 0.489 for traditional scheduling and 0.429 with open access scheduling ($P = .001$).

Discussion

Our findings suggest that open access scheduling decreases continuity of care in a residency clinic. No other changes in policy or clinic management occurred during the study time except for the scheduling method so the change in continuity is unlikely due to other factors. The factors that contributed most to a decline in continuity were a decreased number of visits to the primary physician with a corresponding increase in the number of physicians that each patient saw during open access scheduling. Although there were minor

differences in the demographics of patients seen during the two study periods, this simply reflects a large sample size and variation in the patients who came to the clinic during two study periods.

The structure of family medicine residencies often consists of faculty and residents who have between 1 and 5 half days of patient care sessions per week. Because resident rotation schedules change monthly, the amount of clinic time per week is adjusted monthly depending on the intensity of the rotation. For example, during the inpatient hospital month, residents might see patients only 1 half day per week, while on an outpatient elective, residents might be available 3–5 half days per week. Faculty also have erratic clinic presence as their schedules change weekly for ward coverage, precepting duties, and conference time. Continuity is disrupted because of this irregular provider availability. Open access scheduling further complicates accessibility to the primary care provider. Without pre-booking of appointments, patients only see providers who are available on the day they call for an appointment, rather than scheduling appointments in advance with their primary providers. Based on our experience, this results in less, rather than more, continuity.

Our findings in this study are important because training programs for primary care are required to provide continuity experience for their residents, and open access scheduling impedes continuity of care in our residency clinic. Despite inconsistent findings of improved health outcomes with increased continuity,^{9,11-14} to be eligible for board certification by the American Board of Family Medicine, residents must be able to demonstrate continuous care to a panel of patients.¹⁹ Our findings confirm what the developers of open access scheduling have suggested—continuity is difficult to achieve for providers who work less than 6 out of 10 half days per work week.¹⁵⁻¹⁷

Limitations

Our clinic is located in an inner urban section of a large city where urgent care centers are plentiful, and multiple hospitals with emergency rooms are in close proximity to our office. Programs in other settings may have a different experience with open access scheduling.

In addition, our patient population is young, with the majority of our patients less than 40 years of age. The results of continuity with open access scheduling might have been different with an older population. Such a population would have more chronic diseases, and patients might make more effort to be seen by their continuity physician.⁸ This limitation could be easily assessed by stratifying the results of our findings by age groups in a future study.

Table 2

Patient Visit Demographics*

Demographic Factors	Traditional Scheduling n=11,174	Open Access Scheduling n=11,579	P Value
Age, years			<.001
0–2	1,350 (12%)	1267 (11%)	
3–12	1,373 (12.3%)	1,190 (10.3%)	
13–30	3,172 (28.3%)	3,289 (28.4%)	
31–40	1,793 (16%)	1,867 (16.1%)	
41–64	2,930 (26.2%)	3,445 (29.8%)	
Over 65	556 (4.9%)	521 (4.5%)	
Gender			.018
Male	4,108 (36.7%)	4,437 (38.3%)	
Female	7,066 (63.2%)	7,142 (61.6%)	
Insurance			.001
Self pay	1.80%	2.10%	
Military insurance	2.40%	2.20%	
Private	49.60%	52.80%	
Medicaid	29.50%	24.00%	
Medicare	16.70%	18.80%	

* All comparisons between traditional and open scheduling variables performed using chi square testing.

Table 3

Summary of Continuity of Care With Traditional Scheduling Versus Open Access Scheduling

	Mean UPC* (SD)	Mean MMCI** (SD)
Traditional scheduling	0.59 (0.23)	0.51 (0.30)
Open access scheduling	0.55*** (0.22)	0.44**** (0.29)

* UPC—usual provider continuity index (number of visits to most frequently seen provider)/(total number of visits to all providers).

** MMCI—modified modified continuity index; ratio of number of providers to total number of visits by $([1-(n \text{ of providers}/\{n \text{ of visits}\})]/[1-(1/\{n \text{ of visits} + 0.1\})])$

*** different from traditional scheduling P value= .013 (Mann-Whitney test)

**** different from traditional scheduling P value=.0001 (Mann-Whitney test)

SD—standard deviation

We assumed the continuity provider for the patients in this study was the physician most frequently seen by the patient. We did this based on the definition of the usual provider identified in previous studies.^{18,19,21,23} The patient, however, may not have identified the most frequently seen physician as their continuity doctor. This is a limitation not only of our study but also of open access scheduling in a training setting—patients are left to see physicians that are in the clinic frequently and not their own provider.

Finally, we based continuity only on the number of patient visits to the primary physician. Other aspects of continuity, such as phone management, management of referrals, and hospitalizations where the provider was involved, were not considered in our analysis. Some of these other methods of care—especially phone management by the primary provider—might have eliminated the need for an office visit with that provider and thus lowered the measured rate of continuity. We do not think, however, that this appreciably influenced the results of our study because similar phone management took place both before and after implementation of open access scheduling.

Conclusions

Continuity of care decreased in our clinic as a consequence of implementing open access scheduling. We speculate that the irregular physician availability and the inability to pre-book were reasons why continuity decreased with open access scheduling. Another possibility is that our patients prefer immediate access to care in the short run sacrificing continuity for the long run. Further studies, including patient satisfaction surveys, are needed to determine definitively what aspects of open access scheduling led to a decline in continuity in our office.

Our results have implications for all primary care residency training programs because one of the hallmarks of primary care is maintaining the physician and patient relationship. Though open access scheduling improves access to care, it appears to decrease continuity.

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