Longitudinal Versus Traditional Residencies: A Study of Continuity of Care

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Background and Objectives: Continuity of care is one of the presumed advantages of longitudinal residencies. However, it is not clear how well such residencies provide continuity of care, and, further, there is no recognized acceptable rate of good continuity. We compared traditional and longitudinal residencies to determine the extent to which the residents provided their patients with continuity of care.

Methods: We conducted a systematic chart review at three longitudinal and three matched traditional block-rotation programs. In total, 628 charts were reviewed, and 6,256 visits were evaluated. Continuity with a primary resident was evaluated over a 2-year period, with continuity defined as the percentage of visits for which the patient saw the same resident.

Results: There was no significant difference in overall rates of continuity between longitudinal and traditional programs (59.6% versus 57.8%). One longitudinal program, however, had a 74.8% rate of continuity, which was significantly higher than the rates in the other five programs.

Conclusions: There was no significant difference found in continuity of care provided by residents at longitudinal programs, compared with those at traditional programs. Our results do not support the hypothesis that longitudinal residency programs achieve superior rates of continuity of care. Further comparison studies of longitudinal and traditional programs would be useful.

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Although there are differences among the many family practice residencies across the nation, the vast majority are organized in a traditional block-rotation format. Another model of residency training, the longitudinal residency program, puts emphasis on continuity of care in the family practice center, rather than on block rotations. Longitudinal residency training is a model in which family practice residents learn by providing care to their own patients, with primary emphasis on teaching by family physicians in the family practice center. This is in contrast to the traditional block-based family practice residency, in which much of the time, resident physicians learn by providing care for another health care professional’s patients in settings outside of the family practice center. In block-based programs, care provided in the family practice center is often perceived as interfering with residents’ activities in the hospital or specialist office.

The purported advantages of the longitudinal model include “adult learning/lifelong learning; role modeling, teaching, and resident evaluation by family physicians; and the promotion of continuity of care . . .”1 However, there has been no comparison between block-based programs and longitudinal programs, so at present there are no outcome data to show that the longitudinal method actually trains residents any better than a traditional block residency program or that continuity of care is improved.

Continuity of care is a cornerstone of longitudinal training and is an integral part of the specialty of family practice. In fact, the Residency Assistance Program, in its “Criteria for Excellence in Family Practice Residency” states that “Each resident should provide continuity of care of patients and families, which should be documented.”2 Good continuity of care has been shown

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to decrease the likelihood of hospitalizations, improve cancer screening rates, provide less-expensive care, improve patient compliance, and increase level of trust between physicians and patients. In addition to these benefits, continuity of care has also been shown to provide increased physician satisfaction. Thus, one of the aspects of good residency training is providing residents with high rates of continuity.

At present, there are few data about how well residencies practice continuity of care, no recognized acceptable rate of continuity, and no information available about whether longitudinal programs achieve better continuity than traditional block-based programs. The study reported here compared continuity of care in longitudinal and traditional residencies. The main objective was to determine if the rate of continuity was statistically different in longitudinal and traditional programs.

Methods

Program Selection

Longitudinal residency programs were identified through the use of the American Academy of Family Physicians Directory of Family Practice Residency Programs and program directors of longitudinal residencies. We were able to identify seven longitudinal programs, but we then excluded new programs, Armed Forces programs, and rural programs. This left us with three longitudinal programs to include in the study. We excluded new programs because they had not been operational for an adequate time to allow for good continuity to be established. Armed Forces and rural programs were excluded because the structure of these programs may be considerably different than most family practice residencies.

We then identified three traditional programs for comparison, matched to the three longitudinal programs for several characteristics. Matching criteria included that all programs be suburban and in existence for at least 12 years. Other matching criteria included similarity in infant death rate (as reported by health department data), per capita income, median family income in the area in which the residency is located, and percentage of various insurance providers of the patient clientele. Additionally, all sites are identical in that they are all located in equivalent metropolitan statistical areas (MSAs) (scale 0–9, with 0–2 being similar). We contacted four traditional programs; three agreed to participate. Each program, both the longitudinal and traditional, identified a coinvestigator who would be willing to conduct chart reviews.

Procedures

We developed a one-page chart review instrument to record the data collected from each patient’s chart. This instrument identified each patient’s date of birth, gender, and the third-year resident responsible for that patient’s care. The instrument also recorded the patient’s visits within the previous 22 months. The patients of all third-year residents at each site were included, with the exception of patients of residents who had taken extended leave of absences. This instrument was pilot tested at one site to ensure that the data collected would be accurate. Revisions were made to the instrument based on the pilot test, and the form was then sent to each site for use in the study.

We evaluated continuity of care during most of the second and third years of training of the cohort of residents included in the study. We chose a time interval that began on July 1, 1997, and ended May 11, 1999. This interval allowed residents an extended period of time to establish good continuity with patients and included nearly all of the second and third year of their residencies. A portion of May and all of June 1999 were excluded due to residents finishing training at different times, plus large numbers of residents taking vacation during this time period.

Chart reviewers at each site were instructed to start the review beginning on May 11, 1999, and to include in the audit the records of patients who had at least four visits in the preceding 22 months, working backward to July 1, 1997. For each resident in the programs, the auditing continued until data on 15 patients with at least four visits had been collected. Four visits were chosen as the cutoff, because we felt that this was a large enough number to permit an estimate of the resident’s continuity of care with that patient. If a patient had fewer visits in the time frame, we did not feel there would be justification for reporting continuity of care to be 100%, even if all were with their primary resident.

Continuity of care was defined as the proportion of visits to the same provider over the 22-month period from July 1, 1997, to May 11, 1999. This measure is often referred to as “most frequent provider continuity” (MFPC). The primary care physician was the resident who saw the patient for the majority of visits. For each patient visit, we were able to identify that visit as either “a continuity of care visit” or “not a continuity of care visit.”

One physician at each site conducted the chart reviews. As a check on the validity of the chart reviews, a preset number of charts (five per program) were copied in their entirety to enable a second investigator to verify that charts were being marked appropriately. This confirmation process revealed a 96% reproducibility for data collection.
**Analysis**

To test for differences in the rate of continuity between longitudinal and traditional programs, we used nominal logistic regression analysis with a nested hierarchical model. The dependent variable was the patient visit, defined as continuity of care visit, “yes” or “no.” The independent variables were the program structure (longitudinal versus traditional), the sites (which were also considered nested within each program), and the residents (which were considered nested within the sites). In this analysis, both program and resident were fixed effects, while site and patient visit are random effects. This model allowed us to compare longitudinal and traditional programs while adjusting for site and resident variability.

For simplicity in interpreting the results for each resident’s patient, we obtained a proportion of continuity visits. This was calculated by taking the number of continuity visits and dividing it by the total number of visits for that patient. Each of these continuity rates was weighted by the number of visits, and this was then pooled over all sites within each program. We called this the “overall rate of continuity.” The P value for this difference was obtained from the results of the logistic regression analysis, and 95% confidence intervals were also calculated. All analysis was performed using SAS® software.

Sample size estimation was performed prior to any chart auditing. Each patient was considered an independent Bernoulli trial that could either be “yes” or “no” with respect to continuity of care. The difference between the overall rates of continuity for longitudinal versus traditional programs could be then thought of as the difference between two binomial proportions. To detect a difference of 10% in the rates of continuity would require approximately 388 patients per program (two-tailed type-1 error equal to .05, type-2 error equal to 20%). Extrapolating this number back to the resident, we needed a sample size of at least 12 patients per resident. To ensure that an adequate number of patient records would be assessed, we instructed each site to review 15 charts per resident.

**Results**

A total of 628 patient charts were reviewed. Each medical record met the inclusion criteria of having at least four visits in the 22-month time interval under study. There was an average of 10 visits per patient; 6,256 visits were recorded in the medical record. These visits occurred with a total of 42 residents.

Both the longitudinal and traditional groups had similar characteristics, as shown in Table 1. In addition, the communities in which the residencies were located also had similar characteristics (Table 2).

There were no significant differences in overall rates of continuity between longitudinal and traditional programs (59.6% versus 57.8%, P = .87, Table 3). The combined average rate of continuity at all six sites was 58.5%.

**Discussion**

Family practice residency programs are currently being encouraged to adopt longitudinal training curricula. There are many presumed advantages to this type of training but no outcome data to prove the pre-
Continuity of care in our residency training is one of the cornerstones of family practice and one of the presumed advantages for programs to switch to the longitudinal approach. Our study provides continuity of care differences between longitudinal and traditional block-based family practice programs.

We found no significant difference in continuity of care provided by residents at longitudinal programs, compared with those at traditional programs. This result does not support the presumptive advantages of continuity of care in longitudinal programs. However, one of the longitudinal programs in our study had a continuity rate of 74.8% (95% CI, 69%–80%). With a continuity rate of 74.8%, this program’s continuity rate approaches the highest reported in the literature. There may be characteristics of this program that facilitate the high continuity rate, and the characteristics may be inherent to a longitudinal curriculum, but we did not study individual program characteristics and cannot determine why this program’s continuity was so high.

Continuity is a difficult outcome to measure due to the multiple ways it is defined. Further, studies often look at usual provider continuity (UPC), in which the denominator is derived from a physician’s panel of patients. Many residents do not have defined patient panels and even when panels exist, they are not as solidified as the panels of a practicing physician, thus making this measure ineffective for our study. Most importantly, many of the studies on continuity were done before managed care and in smaller practice groups, likely increasing the rate of continuity and providing residencies with comparisons that are not useful. In fact, it is reported now that nearly 20% of patients change health plans and providers each year. Thus, it is difficult to identify an optimal or practical rate of continuity.

**Limitations**

There were limitations in how our study was performed. The most important is that although an extensive search was carried out, we may have missed some longitudinal programs, as there is no centralized database of longitudinal residency programs to identify all longitudinal programs. However, a recent survey of 442 residencies found only five programs self-identifying as longitudinal programs. Having so few longitudinal programs in the country limited our sample size. Most importantly, there are attributes that contribute to continuity of care that are difficult to measure, such as how comfortable the appointment center staff is with asking patients to wait for their primary physician, the ease with which patients can make the appointment, how comfortable the patient is with asking for a particular physician, etc. None of these factors were evaluated in our study.

**Conclusions**

Continuity of care is one of the presumed advantages of longitudinal training. The results of our study do not support the presumption that longitudinal programs have superior continuity of care. The results do, however, provide rates of continuity that other programs can use as a norm and to which they can compare themselves to determine if they have continuity rates that are similar to other programs. In addition, there are many other differences between longitudinal and traditional programs that need to be examined before more programs switch to a longitudinal tract. Based on only one outcome—continuity—a switch from traditional to longitudinal programs can only be considered experimental and supported more by theory than data.

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**REFERENCES**