The Impact of Interpersonal Continuity of Primary Care on Health Care Costs and Use: A Critical Review

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ABSTRACT

PURPOSE Interpersonal continuity has been shown to play an essential role in primary care's salutary effects. Amid 2 decades of rapid evolution in the health care payment model, we sought to summarize the range of peer-reviewed literature relating continuity to health care costs and use, information critical to assessing the need for continuity measurement in value-based payment design.

METHODS After comprehensively reviewing prior continuity literature, we used a combination of established medical subject headings (MeSH) and key words to search PubMed, Embase, and Scopus for articles published between 2002 and 2022 on "continuity of care" and "continuity of patient care," and payor-relevant outcomes, including cost of care, health care costs, cost of health care, total cost of care, utilization, ambulatory care–sensitive conditions, and hospitalizations for these conditions. We limited our search to primary care key words, MeSH terms, and other controlled vocabulary, including primary care, primary health care, family medicine, family practice, pediatrics, and internal medicine.

RESULTS Our search yielded 83 articles describing studies that were published between 2002 and 2022. Of these, 18 studies having a total of 18 unique outcomes examined the association between continuity and health care costs, and 79 studies having a total of 142 unique outcomes assessed the association between continuity and health care use. Interpersonal continuity was associated with significantly lower costs or more favorable use for 109 of the 160 outcomes.

CONCLUSIONS Interpersonal continuity today remains significantly associated with lower health care costs and more appropriate use. Further research is needed to disaggregate these associations at the clinician, team, practice, and system levels, but continuity assessment is clearly important to designing value-based payment for primary care.

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INTRODUCTION

Interpersonal continuity of care, defined as the ongoing relationship between the physician and the patient, was labeled a core attribute of high-quality primary care in 2 seminal reports from the National Academy of Medicine.[1,2] As a measurement construct, continuity can be assessed by analyzing the duration, density, dispersion, or sequence of patient visits to the same physician.[3] The importance of continuous trusting relationships was highlighted during the COVID-19 pandemic, a time of disinformation and growing patient distrust and associated vaccine hesitancy.[4] Continuity has been shown to improve trust in one's physician overall[5,6] and specifically among African Americans,[7] low-income women,[8] and the elderly,[9] populations disproportionately impacted by the pandemic. Trusting, continuous relationships have also been tied to higher levels of vaccination, vital amid growing distrust in science and medical institutions.[10,11] Simultaneously, there have been documented declines in patients' ability to identify usual sources of primary care, as patients increasingly make first contact with the health system using open-access scheduling, urgent care, and virtual options.[12-14]

In a pair of evidence reviews, Saultz and Lochner[15] and Saultz and Albedaiwi[16] summarized the continuity literature published between 1962 and 2002, with specific focus on the relationship of interpersonal continuity of care with patient satisfaction, measures of care, health care use, and costs of care. Assessing 22 studies and 41 outcomes identified as relevant to cost and use, they found continuity to be associated with decreased costs and improved use as indicated

by fewer hospitalizations and greater uptake of preventive services. The 20 years since have witnessed radical shifts in health information technology, a pivot away from continuity as patient-centered medical homes have emphasized open-access scheduling, and new health care measures, including clinician- and practice-level measures of primary care continuity and their relationship to policy-relevant outcomes. Additionally, growth in the number and proportion of insured patients, spurred on by the Patient Protection and Affordable Care Act (ACA) and the Medicare Access and CHIP Reauthorization Act (MACRA), have galvanized movement toward measure-driven, value-based payment models. This trend continues to grow, and evidence links its implementation to reduced health care costs and more desirable use.[17]

Despite the observed declines in continuity relationships, the ACA actually provided protections to improve patients' continuity of care.[18] Innovations in care delivery, including telehealth and asynchronous communication tools such as portals and applications (apps) whose adoption was accelerated by the COVID-19 pandemic, also offer the potential to positively impact continuity of care.[19] In this context of radical transformations of delivery, payment, data, and relationships, an updated summary of evidence related to continuity of care is needed. To fill this gap, we conducted a comprehensive literature review on continuity from the end point of the review by Saultz and Lochner[15] in April 2002 through November 2022. We specifically sought studies that assessed the association of continuity of care with health care costs or use in the primary care setting, hoping to inform a new era of value-based payment design.

METHODS

Our comprehensive literature review began with an assessment of the content domain before 2002, followed by a structured search of peer-reviewed publications as outlined in Supplemental Table 1. Guided by a research librarian (L.H.), we searched the PubMed, Embase, and Scopus databases, using a combination of key words, medical subject headings (MeSH), and other controlled vocabulary for articles published between April 30, 2002 and November 6, 2022.

At least 2 authors independently reviewed the titles and abstracts of all outputs using specific inclusion criteria: studies needed to measure primary care continuity and assess its association with health care costs or use. We eliminated articles not relevant to our focused aims and outcomes, including those focused on care coordination or transition rather than care continuity. All references in relevant articles were also reviewed to identify other articles possibly missed by the search. Although we intentionally limited our search terms related to hospitalizations to hospitalizations for ambulatory care–sensitive conditions (ACSC), we also reviewed studies examining all-cause and other types of hospitalization identified by the initial search.

After the articles were reviewed and irrelevant ones removed, we categorized the articles reporting studies based on the outcomes measured, how they were measured, and the study's key findings. We also split the study articles into 2 outcome-based groups: cost and use. Those assessing continuity's association with use were further grouped based on type of use: hospitalizations, emergency department (ED) use, other undesirable use, desirable use, and primary care use.

We then summarized the key aspects of each study into tables; those analyzing both cost and use were coded as such in the appropriate tables. The study aspects summarized included the methods used, setting, sample size, how continuity or its proxy was measured, whether a relationship was observed, and a summary of the key findings.

Cost outcomes were categorized as showing a positive association (ie, more continuity of care was associated with lower cost), negative association, or no or conflicting association. Similarly, use outcomes were scored by at least 2 authors as showing positive, negative, or no or conflicting associations. A positive association was defined as more continuity leading to a better outcome (ie, more use of desirable health care services and less use of undesirable health care services such as unnecessary hospitalizations or ED visits).

The sources for the continuity of care measures used in the studies were obtained and are briefly summarized in Supplemental Table 2. We followed a similar analytic process for the 4 reviews.

RESULTS

Article Identification

Our structured search yielded 571 articles after duplicates were removed (Figure 1). The abstract and title scan and the review process ultimately reduced the number to 87 articles (83 studies plus 4 reviews) on the association of continuity with health care costs and/or use published between 2002 and 2022. Characteristics of the studies are shown in Table 1.

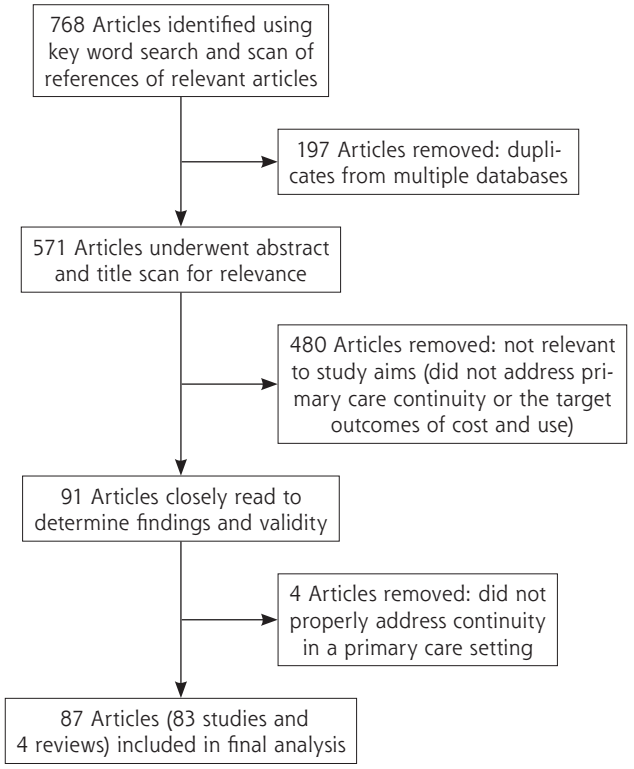
Of the 83 studies, 18 studies assessed continuity's association with some form of health care costs, including total costs, drug costs, and hospitalization costs, among others, and 79 studies assessed continuity's association with some form of health care use, described further below. Collectively, the 83 studies captured 160 unique cost and use outcomes of interest for this review.

Associations of Continuity With Outcomes

Findings of the 160 study outcomes stratified by the nature of the association with continuity (positive, negative, or no/conflicting association) are summarized in Table 2. Overall, greater continuity was associated with significantly lower costs or more favorable use for 109 of 160 outcomes.

The 18 studies assessing the association of continuity with health care costs are summarized in Supplemental Table 3 (studies assessing only cost) and Supplemental Table 4 (studies assessing cost and use). Among these 18 studies, 14 found

Figure 1. Flowchart of process used to identify relevant articles.



continuity to be associated with lower costs of care, while the other 4 found no significant difference.

The 79 studies assessing the association of continuity with health care use had 142 total unique outcomes. These studies are summarized in Supplemental Table 5 (studies assessing use only) and Supplemental Table 4 (studies assessing use and cost). For 95 of the 142 outcomes, continuity was associated with more favorable use. For the other 47 outcomes, 36 showed no clear relationship or a mixed relationship, 3 showed greater continuity to be associated with less favorable use, and 8 primary care use outcomes had an unclear or negative association.

The 4 reviews are summarized in Supplemental Table 6.

Specific Use Outcomes

Various measures of use were assessed. A total of 42 studies with 57 unique use outcomes analyzed continuity's association with hospitalization. For 38 of the 57 outcomes, greater continuity was associated with lower hospitalization rates. Categorizing the use outcomes further, 14 of the 20 outcomes found a clear relationship between increasing continuity and fewer ACSC hospitalizations. Of the 27 studies that included all-cause hospitalizations as an outcome, 20 found an association between greater continuity and fewer hospitalizations. Among studies assessing the rest of the hospitalization outcomes, 1 study of acute hospitalizations reported no relationship with continuity; 4 out of 5 studies of diabetes-related hospitalizations found a positive relationship (less use); 2 studies of hospitalization for serious mental illness found no association; 1 study of heart failure–related hospitalization found no relationship; and 1 study found that continuity did not influence number of nights in a hospital, nursing home, or convalescent home.

A total of 40 studies assessed the association of continuity with ED use using 43 unique measures. For 35 of these measures, increasing continuity was significantly associated with less ED use.

A total of 14 studies having 15 unique outcomes assessed the association of continuity with what is termed desirable or

Table 1. Characteristics of Included Studies by Outcome Category (N = 83 Studies)

Outcome Category	No. of Studies[a]	Study Design			Study Location	Study Population
		Retrospective Cohort	Prospective Cohort	Other		
Cost	18	14	3	1	8 United States, 3 Korea, 2 Canada, 2 Taiwan, 1 Belgium, 1 Israel, 1 United Kingdom	General adults or children; patients with dementia, diabetes, CHF, COPD, hypertension, angina, CKD, osteoarthritis, ESRD, hypercholesterolemia, stroke, knee OA, or serious mental illness
Use	79	60	13	6	38 United States, 10 Taiwan, 10 Canada, 6 United Kingdom, 3 Korea, 3 Australia, 2 Brazil, 2 Israel, 2 Norway, 1 Netherlands, 1 Germany, 1 Europe	General population, children, adults, elderly patients, infants, or sexually active women; disease groups including patients with diabetes, cancer, hypertension, knee OA, dementia, CHF, COPD, hypercholesterolemia, serious mental illness, HIV, asthma, hyperlipidemia, ESRD, CAD, OA, osteoporosis, depression, and obesity, as well as children with medical complexities

CAD = coronary artery disease; CHF = congestive heart failure; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; ESRD = end-stage renal disease; OA = osteoarthritis.

[a] Some studies assessed both cost and use outcomes.

appropriate use. Examples of the desirable use or procedures studied are outlined in Supplemental Table 5. For the 15 outcomes reported, 7 showed a significant association between greater continuity and desirable (more) use. Twelve studies assessed some form of undesirable use, which has been defined in campaigns such as Choosing Wisely as use that is of low value to the health care system.[20,21] These outcomes are also outlined in Supplemental Table 5. Eight out of the 12 studies found that continuity was associated with more favorable (less) use.

Lastly, 13 studies with 15 unique outcomes assessed the association of continuity with use of primary care. Continuity was associated with more favorable primary care use for only 7 of these 15 outcomes.

DISCUSSION

Despite implementation of the ACA, changes in the delivery system such as patient-centered medical homes, and movement toward value-based payment over the past 2 decades, our review confirms that continuity of primary care still has positive effects on 2 outcomes deemed essential to policy makers and payors, lowering costs and reducing undesirable use. Like Saultz and Lochner[15] in 2005, we found increased interpersonal continuity to be associated with a decrease in health care costs and more effective health care use across most identified articles.

In terms of health care costs, our results showed favorable associations in 14 out of the 18 studies, similar to the overall findings of the 2005 review.[15] These outcomes included measures of total costs, hospital costs, primary care costs, and others, all of which generally decreased with increasing continuity. Important outliers included a study finding that continuity was associated with more drug purchases, and another study finding that it was associated with higher medication costs. It is clear, as none of the other 16 studies investigated drug costs, that more investigation of these outcomes is necessary to help assess how much of the associations relates to greater access, insurance variability, and selection bias. In contrast, 3 of our included studies showed that continuity decreased antibiotic prescriptions and duplicated medications. Although these 18 studies did not provide a clear conclusion of the impact of continuity on prescription drug use and costs, overall health care costs decreased with greater continuity of care.

In terms of health care use, we found significant positive associations for 95 out of the 142 outcomes assessed. Although not as strong of an association as that with cost of care, these findings are consistent with those of Saultz and Lochner,[15] which showed that 35 out of the 41 cost or use variables they assessed, including hospitalizations and preventive care, improved with continuity. As it pertains to the different types of use, ED use and the miscellaneous other undesirable use categories had the most consistent association with continuity, with the vast majority of outcomes showing a positive relationship and only 1 outcome between these 2 categories combined showing a negative relationship. Hospitalization and desirable use also showed an association for the majority of the outcomes assessed, but these relationships were weaker, with only slightly more than one-half of the included outcomes showing a clear positive association. Although fewer studies showed a clear positive relationship, only 1 of the hospitalization outcomes, specifically in a study examining ACSC hospitalizations, was shown to increase with improved continuity. This same study, however, found continuity was associated with fewer all-cause hospitalizations, less ED use, and lower total costs, indicating that continuity still reduced use overall. As for desirable use, only 2 out of the 15 outcomes found continuity to be either negatively or not associated with any form of desirable use or procedure, with the rest showing an association between higher continuity and a greater use of some but not all desirable health care services. None of our use findings were unexpected, and all were largely consistent with those of Saultz

Table 2. Summary Findings of the Association of Continuity With Cost and Use Outcomes (N = 160 Outcomes)

Outcome Category	No. of Outcomes	Association of Continuity With Outcome		
		Positive[a]	Negative	None or Conflicting
Cost	18	14	1	3
Use	142	95	4	43
Hospitalization	57	38	1	18
ASCS	20	14	1	5
All cause	27	20	0	7
Other	10	4	0	6
ED use	43	35	1	7
Desirable use[b]	15	7	1	7
Undesirable use[c]	12	8	0	4
Primary care use[d]	15	7	0	8

ACSC = ambulatory care–sensitive conditions; ART = antiretroviral therapy; CRC = colorectal cancer; CT = computed tomography; ED = emergency department; HbA_{1c} = glycated hemoglobin; ICU = intensive care unit; LDL = low-density lipoprotein cholesterol; LVF = left ventricular function; TB = tuberculosis.

[a] Greater continuity was associated with lower costs or with better use outcome (more use of desirable health care services or less use of undesirable health care services).

[b] Guideline-concordant receipt of vaccinations; lead, anemia, and TB screening; prescription drug use; HbA_{1c} screening; annual LDL screening; annual nephropathy screening; annual serum creatine screening; annual LVF test for patients with heart failure; breast, cervical, CRC, and prostate cancer screening; chlamydia screening; recognition of chronic disease; HIV ART adherence; medication/statin adherence; receipt of medical advice about child nutrition, development, and dental health; primary care follow-up within 30 days of inpatient stay.

[c] CT scan of brain, chest radiograph, and urinalysis; total inpatient and outpatient days; duplicated medication (being prescribed drugs in the same pharmacotherapeutic subgroups by separate physicians with overlapping prescription days); use and overuse of various medical procedures; antibiotic prescriptions; ICU use.

[d] Frequency, number, and type (eg, routine well care) of visits to primary care.

and Lochner.[15] Use of primary care, however, did not appear to be consistently affected by continuity, as higher continuity was associated with more use of primary care for only 7 of 15 outcomes.

The evident benefits of continuity of care are even more noteworthy when considering possible confounding variables. For instance, sicker people and those with medical reasons for more frequent visits would likely have more relational continuity. Logically, this situation would cause higher costs and use in high-continuity patients. Our discovery that this is generally not the case may actually make our findings more noteworthy, suggesting a further association of continuity with improvements in cost and use outcomes.

Several limitations of our review should be noted. Nearly all of the included studies had retrospective or prospective cohort designs, and our search did not identify any randomized trials, limiting our ability to declare anything but correlation between continuity and these outcomes. We also recognize that individual studies present their own biases; however, our large sample size (83 studies, 160 outcomes) limits the concern that bias in any individual study would substantially alter our findings.

Our review reaffirms the heterogeneity of continuity measurement as well as its importance, and hints at the potential power of such measurement in an age of value-based payment.[22,23] The importance of continuity as a proxy for trust and desirable use has only increased as the nation wrestles with the dual threats of a pandemic and systemic inequality. Continuity alone is hardly a panacea, but the results of this new review remind us of the importance of continuity of primary care in addressing critical health system challenges. Many have noted threats to continuous relationships in an age of fragmentation, technologic substitutes for primary care, and a lack of supporting payment incentives.[24] The percentage of US citizens able to identify an individual usual source of care has been in decline for decades,[14] as integrated health systems promote open access over continuity of interpersonal primary care, a particular concern among the chronically ill.[22,25]

Our findings should be of great interest to policy makers and payers who have yet to contain annual cost increases and a simultaneous pricing problem for hospital and acute service delivery.[26] Health care policy to promote continuity of primary care might be achieved through new payment incentives rewarding higher measured continuity of care, protections for continuity introduced by the ACA, or novel initiatives such as one in California aimed at improving continuity by assigning patients to specific medical professionals and establishing continuous relationships with that professional.[27] Initiative results suggested that patients consistently seeing their assigned primary care clinician had lower rates of ED use and hospitalization. Initiatives like this one, paired with recognition of the value of continuity by primary care physicians and patients themselves, have the potential to improve health care costs and use.

Our review also highlights the need for more tailored research into additional gaps of knowledge around continuity and outcomes. These areas for research include the individual effects of clinician-, team-, and practice-level continuity, and the relationships of continuity with a variety of other outcomes aligned with health system goals.

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Key words: continuity of care; primary care; health care costs; health care utilization; measurement; value-based health care; health services; health services research; health services needs and demand; health policy

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Supplemental materials

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