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# Medical Group Structural Integration May Not Ensure That Care Is Integrated, From The Patient's Perspective

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**ABSTRACT** Structural integration is increasing among medical groups, but whether these changes yield care that is more integrated remains unclear. We explored the relationships between structural integration characteristics of 144 medical groups and perceptions of integrated care among their patients. Patients' perceptions were measured by a validated national survey of 3,067 Medicare beneficiaries with multiple chronic conditions across six domains that reflect knowledge and support of, and communication with, the patient. Medical groups' structural characteristics were taken from the National Study of Physician Organizations and included practice size, specialty mix, technological capabilities, and care management processes. Patients' survey responses were most favorable for the domain of test result communication and least favorable for the domain of provider support for medication and home health management. Medical groups' characteristics were not consistently associated with patients' perceptions of integrated care. However, compared to patients of primary care groups, patients of multispecialty groups had strong favorable perceptions of medical group staff knowledge of patients' medical histories. Opportunities exist to improve patient care, but structural integration of medical groups might not be sufficient for delivering care that patients perceive as integrated.

Care integration has emerged as critical to improving health system quality and reducing costs,<sup>1</sup> especially for chronically ill patients. The challenges of caring for patients with chronic illnesses are significant and intensifying.<sup>2</sup> Forty-five percent of Medicare beneficiaries have four or more chronic conditions.<sup>3</sup> Care for the chronically ill tends to be multifaceted, long-term, distributed across many providers, and complicated by socioeconomic challenges.<sup>4</sup> Transforming the health system to deliver care that is truly integrated has proved challenging.

Structural change among care delivery organizations has garnered attention as a pathway

toward improving care coordination.<sup>5</sup> In theory, organizations that are more structurally integrated may be more capable of managing care processes, coordinating care across specialties and settings, and exploiting economies of scale and scope—thereby lowering costs and improving quality.<sup>6</sup> Accordingly, some practitioners and policy makers have expressed enthusiasm about and made investments in both horizontal and vertical integration. *Horizontal integration* generally refers to physicians merging into large, multispecialty groups; *vertical integration* refers to physicians and hospitals merging through ownership and contractual arrangements.<sup>6</sup> However, empirical studies of the associations

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between these structural characteristics and cost, quality, and patient experience outcomes have yielded mixed results.<sup>8,9</sup>

These mixed results may stem from the notion that the structural integration of health care organizations is conceptually distinct from integrated care delivery.<sup>10</sup> Integrated care is coordinated across entities, continuous over time, tailored to patients' and families' needs and preferences, and based on patients' and caregivers' sharing responsibility.<sup>10</sup> From this perspective, it is clear that structural integration may or may not lead to integrated care. Unfortunately, comprehensive measures of integrated care have not been readily available until recently, so the empirical relationship between structural integration and integrated care has remained unclear.

In this study we refined a previously validated integrated care survey,<sup>11</sup> administered it to a national sample of Medicare beneficiaries with multiple chronic conditions, and developed a new set of measures and operational assessments of integrated care that were more detailed than existing measures.<sup>12</sup> We report on the empirical relationships we observed between these measures and structural characteristics (such as size and ownership) of medical groups. We characterized structural integration in this study using measures of organizational structure (larger size, hospital ownership, and multispecialty status) and structural capabilities (more advanced information technology [IT] systems and care management processes).

In the United States, the number of large multispecialty groups has grown,<sup>5</sup> and the percentage of physicians describing themselves as independent practice owners has declined.<sup>13</sup> Understanding whether and how these changes improve care integration from the patient's perspective is critical, yet in much of the research on care integration, the patient's perspective is missing. Our survey offers a way to incorporate this perspective in assessments of care integration and to identify opportunities for health systems to improve care for patients with chronic illnesses.

## Study Data And Methods

**SURVEY INSTRUMENTS** We started with two surveys—the Patient Perceptions of Integrated Care survey, which collects data on patient-perceived care integration,<sup>11</sup> and the National Study of Physician Organizations, which collects data on medical group integration.<sup>14</sup>

With input from a panel of twenty-seven expert advisers, we refined the first survey instrument to specifically address care integration issues among high-need patients. We added several

items and adjusted frequency scales to address problems that were identified in cognitive testing of the survey. The refined version underwent pilot and further cognitive testing and was assessed for reliability and validity. (For details about the survey refinement, scale development, and psychometric analysis, see online Appendix A1).<sup>15</sup> In addition to sixteen questions about demographic and other patient characteristics, the refined survey contained fifty-nine questions about patients' experience of care across the following settings: the primary provider's office, specialists' offices, hospitals, and home.

**SAMPLES** We drew a sample of 150 medical groups from the 2012 and 2013 National Study of Physician Organizations. We stratified the sample by organizational characteristics (size, ownership, specialty mix, IT capabilities, and care management processes).<sup>14</sup> To link the groups to physicians in them, we used National Provider Identifier numbers in the National Plan and Provider Enumeration System, developed by the Centers for Medicare and Medicaid Services (CMS) to assign unique identifiers to providers.

Using 2011 Medicare Provider Analysis and Review claims data and the Master Beneficiary Summary File Chronic Conditions segment, we sampled 12,364 mostly elderly Medicare beneficiaries who had two or more chronic conditions and who saw physicians affiliated with one of the selected medical groups. We chose beneficiaries with multiple chronic conditions because research has indicated that care integration is particularly important and challenging for this population of patients.<sup>10</sup> We attributed patients to medical groups based on a plurality of outpatient claims from a given physician. Then we randomly selected up to 120 beneficiaries per medical group, oversampling hospitalized patients so that they made up 33 percent of the sample.

We administered the refined survey by mail in the period July–October 2014. Surveys were mailed to beneficiaries in three waves. After we excluded 412 beneficiaries whose surveys were returned as undeliverable, who had died, or who requested removal from the database, the final sample consisted of 3,067 respondents who received care in 144 medical groups, for a response rate of 26 percent. This response rate is consistent with similar mail-based patient surveys, which often report rates around 30 percent.<sup>16–18</sup> Our methods for addressing nonresponse included regression weighting for nonresponse and comparing respondents to nonrespondents.

**DOMAINS OF INTEGRATED CARE** For each survey item, we tabulated the percentages of respondents answering “never,” “sometimes,” “usually,” or “always” to each question. We translated

# For ACOs and patient-centered medical homes, structural change may be necessary but insufficient for integrating care.

each response to a four-point Likert scale (ranging from low to high agreement, or from “never” to “always”) to create numeric item scores. Using exploratory and confirmatory factor analyses on a split sample, we derived six domains of integrated care: (1) provider knowledge of the patient (medical history, needs, and values); (2) staff knowledge about the patient’s medical history; (3) specialist knowledge about the patient’s medical history; (4) provider support for the patient’s self-directed care; (5) provider support for the patients’ medication adherence and home health management; and (6) test result communication.

We calculated domain scores as the unweighted average of the survey item scores within each domain. The six-domain structure achieved good model fit, internal validity, discriminant validity, and construct validity (for psychometric properties and domain structure, see Appendix A1).<sup>15</sup>

**PATIENT CHARACTERISTICS** The refined survey gathered demographic information, which we converted to binary variables to indicate a respondent’s having some college education, being male, being ages seventy-five and older, having an annual household income of more than \$40,000, being white, being Hispanic ethnicity, and living alone. The survey also included a control for whether the respondent had help completing the survey and a twenty-four-point scale that measured life orientation toward optimism,<sup>19</sup> as optimism has been linked to better subjective well-being, more proactive behavior, and better physical health.<sup>20</sup> We used the number of chronic conditions reported by CMS to measure health status.

**MEDICAL GROUP CHARACTERISTICS** Measures of medical group characteristics were derived from the National Study of Physician Organizations. These measures were group size (solo; small, with two to nine physicians; or large, with

ten or more physicians), hospital ownership, practice type (multispecialty or primary care), a technological capabilities index; and a care management index.<sup>21</sup> We defined practices as more structurally integrated if they were multispecialty, large, and hospital-owned. Based on existing theory, we hypothesized that practices with greater structural integration and IT capability and better care management processes would be associated with higher patient perception of integrated care.<sup>22</sup>

**STATISTICAL ANALYSES** Because domain scores were derived from categorical survey responses, we treated them as ordered categorical variables, and we divided patients’ responses into quartiles to ease interpretation. We used ordered logistic regression models to estimate the odds of patients’ perceptions of integrated care being associated with each medical group characteristic, controlling for the other group characteristics and for patient health, optimism, and demographic characteristics.

Ordered logistic models assume that, given a set of categorical outcomes, the relative odds associated with each possible pair of outcomes is equivalent for all pairs. A Brant test of this proportional odds assumption was nonsignificant, which confirmed that our use of ordered logistic regression was appropriate.

Consistent with common reporting methodologies, we excluded from the analysis medical groups with fewer than five respondents, to minimize individual patient nonresponse bias. We imputed patient characteristics using mean imputation—that is, we replaced missing values with the mean of available cases—to minimize the impact of missing values.<sup>23</sup> We used the SVY procedure in Stata to account for the complex, multilevel sampling design and to weight for survey nonresponse. Regressions were weighted at the patient level by the inverse probabilities of selection for the sample, a method recognized as producing estimates that resemble population statistics more closely, compared to unweighted models.<sup>24</sup> Standard errors of all regressions were clustered by medical group to account for the nonindependence of observations and improve the accuracy of statistical tests.

We performed robustness checks using alternative specifications such as using ordinary least squares and including medical groups with fewer than five patient respondents, and we obtained similar results (see Appendices A4–A6).<sup>15</sup> Our results were not adjusted for multiple comparisons. Because the integration domains were significantly correlated, these data violated a key assumption of multiple comparison adjustments: independence across tests.<sup>25</sup> Because our findings emphasize the lack of strong relation-

ships among patients' perceptions of integrated care and structural variables, not applying a false discovery rate was conservative.

**LIMITATIONS** This study had several limitations. First, our sample was cross-sectional, which limited our ability to make causal inferences.

Second, because medical group data were collected in late 2012 and 2013 while patient survey data were collected in 2014, organizational features recorded in our study could differ from those the patients experienced if an organization had changed structurally (for example, merged with another organization) in the interim. Such discordance was likely uncommon, given the slow pace of organizational change.

Third, the levels of integrated care perceived by this sample of mainly elderly patients with multiple chronic conditions might not be the same levels perceived by younger and healthier patients, who face fewer opportunities for care fragmentation and may have greater capacity to manage their own care.

Finally, while the response rate was similar to

that of mail-based patient surveys, bias could have arisen from systematic differences between responders and the underlying population. Sample nonrespondents had slightly more chronic conditions than respondents did (mean: 7.2 versus 6.7;  $p < 0.01$ ). Past research has shown that late survey respondents often share characteristics with nonrespondents,<sup>26</sup> and we did not find significant ( $p = 0.07$ – $0.97$ ) differences in patient perceptions when we compared respondents in the first and last waves of the survey.

### Study Results

The mean number of chronic conditions among respondents was 6.7 (Exhibit 1). Most respondents were white, and a majority were female and had at least some college education.

**SURVEY RESPONSES BY INTEGRATED CARE DOMAIN** The three domains with the most consistently positive responses were test result communication (with 73.4 percent of the responses in the most favorable category), provider knowledge of the patient (65.8 percent), and specialist knowledge about the patient's medical history (61.1 percent) (Exhibit 2). The two domains with the least consistently positive responses were provider support for medication and home health management (13.4 percent) and support for self-directed care (33.2 percent). Both of these two domains also had relatively high percentages of responses in the least favorable category—19.9 percent and 10.7 percent, respectively. Results were more mixed for the last domain, staff knowledge about the patient's medical history (for details, see Appendix A3).<sup>15</sup>

**RELATIONSHIPS OF INTEGRATED CARE DOMAINS WITH PATIENT CHARACTERISTICS AND STRUCTURAL CHARACTERISTICS OF MEDICAL GROUPS** We found several strong, consistent relationships between patient characteristics and patients' perceptions of integrated care. For example, for every one-point increase in the optimism score, patients exhibited 1.56 times greater odds of responding in a higher quartile for provider knowledge of the patient than in a lower quartile (Exhibit 3).

In contrast, structural characteristics of medical groups exhibited fewer significant relationships with patients' perceptions of integrated care. Compared to patients of primary care medical groups, patients of multispecialty groups had 1.73 times greater odds of responding in a higher quartile for staff knowledge about the patient's medical history than in a lower quartile.

There were no strong relationships between patients' perceptions and either hospital ownership or technological capabilities, with odds ratios close to 1.00 for all domains—which means

#### EXHIBIT 1

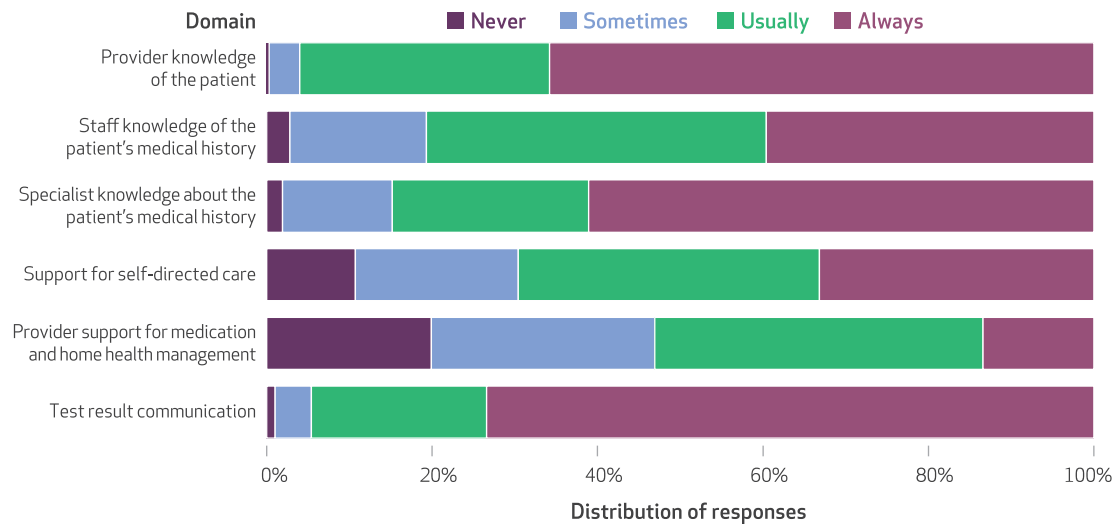
Characteristics of a sample of Medicare beneficiaries with multiple chronic conditions and of their medical groups

	Number (%) of groups	Beneficiaries	Mean
<b>BENEFICIARY CHARACTERISTICS</b>			
Ages 75 and older		54.1%	
Male		41.4	
At least some college		55.2	
Hispanic		3.7	
White		89.2	
Living alone		34.1	
Annual household income over \$40,000		41.6	
Received help completing the survey		12.4	
Number of chronic conditions			6.7
Optimism score <sup>a</sup>			22.58
<b>MEDICAL GROUP CHARACTERISTICS</b>			
Size (number of physicians)			
Solo (1)	19 (13)	12%	
Small (2–9)	62 (43)	44	
Large (10 or more)	63 (44)	44	
Multispecialty	65 (45)	44	
Primary care	79 (55)	56	
Hospital owned	72 (50)	48	
Not hospital owned	72 (50)	52	
Technological capabilities index <sup>b</sup>			10.07
Care management index <sup>c</sup>			5.04

**SOURCE** Authors' analysis. **NOTES** There were 3,067 beneficiaries who responded to the survey. Percentages are based only on the numbers of respondents answering a given question. The share of nonrespondents was less than 10 percent for all items except for income, which was 23.7 percent. There were 144 medical groups included in the regression analysis (6 of the original 150 groups were excluded because of lack of response). <sup>a</sup>On a scale of 0 to 24, with higher scores indicating greater optimism. <sup>b</sup>On a scale of 0 to 19, with higher indexes indicating greater capability. <sup>c</sup>On a scale of 0 to 15, with higher indexes indicating better care management.

**EXHIBIT 2**

**Perceptions of integrated care among Medicare beneficiaries with multiple chronic conditions, by domain of integrated care**



**SOURCE** Authors' analysis. **NOTES** There were 3,067 beneficiaries who responded to the survey. The percentages of responses shown for each domain were calculated as the numerical average of the Likert-scale responses (1 was never, 2 was sometimes, 3 was usually, and 4 was always) for each survey item in the domain, rounded to the nearest whole number. "Provider knowledge of the patient" refers to the provider's knowledge of the patient's medical history, needs, and values.

that patients were as likely as not to give responses that reflected greater perceived care integration. This result was particularly consistent for technological capabilities, with odds ratios across domains ranging from 0.99 to 1.01.

There were no consistent patterns between medical group size and domains of patient-perceived integration. Compared to patients of large medical groups, patients of both solo practices and small groups had greater odds of responding in a higher than a lower quartile for three of the domains, but the odds were significant only for patients in small groups and the domain of provider support for patient's medication adherence and home health management.

The results for care management processes suggest a slightly negative relationship with patients' perceptions of integrated care, with the odds ratios all less than or equal to 1.00. However, only in the domain of test result communication were the odds significant.

**Discussion**

Our results suggest two main findings. First, patients perceive less integrated care in domains that particularly reflect patient-centeredness, compared to other domains. Second, medical groups that are more structurally integrated as defined in this study (those that are large, multi-specialty, and owned by a hospital; have technological capabilities; and use care management

processes) do not systematically provide care that patients perceive as more integrated.

Specifically, in the two survey domains that we believe particularly reflect patient-centered care—provider support for both the patient's self-directed care and the patient's medication and home health management—patients were the least likely to perceive integrated care. Only 33 percent of respondents said that providers always supported them in the first domain, and just 13 percent said that providers always supported them in the second. In neither domain did the more structurally integrated medical groups achieve significantly higher perceptions of care integration, compared to other groups. In fact, compared to patients in small groups, patients in large groups reported significantly lower perceptions of integrated care in the domain of provider support for the patient's medication and home health management. These findings lend some support to past research indicating that dimensions of care that are important to patients are often neglected by providers in their efforts to integrate care, including by providers in patient-centered medical homes and in physician groups that are integrated with hospitals.<sup>27</sup>

In addition, we did not find strong evidence that patients of more structurally integrated medical groups perceived their care as more integrated. This finding suggests caution for providers moving toward more structural integra-

EXHIBIT 3

Associations between domains of integrated care and the characteristics of medical groups and of Medicare beneficiaries with multiple chronic conditions

Domain	Provider support for:					
	Provider knowledge of the patient	Staff knowledge of the patient's medical history	Specialist knowledge about the patient's medical history	Self-directed care	Medication and home health management	Test result communication
<b>MEDICAL GROUP CHARACTERISTICS</b>						
Multispecialty (vs. primary care)	1.14	1.73**	1.09	1.09	1.18	0.95
Hospital owned (vs. not hospital owned)	0.94	1.04	1.00	0.94	1.07	0.98
Solo (vs. large) <sup>a</sup>	1.04	1.57	0.80	1.19	1.15	0.73
Small (vs. large) <sup>a</sup>	1.06	1.11	0.85	0.94	1.34***	1.08
Technological capabilities index <sup>a</sup>	0.99	0.99	1.01	0.99	1.01	1.01
Care management index <sup>a</sup>	0.99	0.98	1.00	0.99	0.99	0.93***
<b>BENEFICIARY CHARACTERISTICS</b>						
Ages 75 and older	1.00	1.09	0.92	0.84**	0.81***	0.93
Male	1.09	1.33*	1.09	1.24**	1.25***	0.97
At least some college	0.75***	0.60***	0.77**	0.79***	0.68***	0.81**
Hispanic	0.87	1.23	1.77	0.78	0.75	0.49**
White	1.35**	1.04	1.04	0.75**	0.86	1.39**
Higher income <sup>b</sup>	0.80**	1.07	0.79**	0.79**	0.77***	1.17
Living alone	1.09	1.62***	1.08	1.03	0.92	1.11
Survey help	0.82	0.76	0.81	1.01	1.15	1.00
No. of chronic conditions <sup>c</sup>	0.99	1.09***	1.04**	1.01	1.04***	0.95***
Optimism score <sup>a</sup>	1.56***	1.65***	1.42***	1.52***	1.25***	1.33***
No. of respondents	2,609	727	1,622	2,621	2,556	2,013
No. of medical groups	136	85	125	136	136	127

**SOURCE** Authors' analysis. **NOTES** The exhibit shows odds ratios from ordered logistic regressions relating the six domains to the characteristics of beneficiaries and medical groups. Odds ratios are interpreted as the average odds of a patient's providing responses in a higher quartile of perceived integration relative to responses in lower quartiles. For example, patients of multispecialty groups have 1.73 times greater odds of being in a higher quartile versus a lower quartile of staff knowledge of the patient's medical history compared to patients in the reference category (those in primary care medical groups). "Provider knowledge of the patient" refers to the provider's knowledge of the patient's medical history, needs, and values. <sup>a</sup>Explained in the Exhibit 1 Notes. <sup>b</sup>Annual household income over \$40,000. <sup>c</sup>Number of twenty-seven conditions defined by CMS as chronic. \**p* < 0.10 \*\**p* < 0.05 \*\*\**p* < 0.01

tion: Even if structural features of integration increase a medical group's technical capacity for coordination, the care it delivers might not be experienced as more integrated than care delivered by medical groups that are not structurally integrated. In fact, as noted above, patients in small practices were more likely to perceive care as integrated, compared to patients in large practices. Furthermore, patients in practices with greater technological capability were no more likely than patients in other practices to perceive care as more integrated. It is possible, for instance, that physicians with more sophisticated IT systems spend more time interacting with electronic health records, which takes time away from direct interaction with patients. A similar phenomenon has been observed in the airline industry, where heavy reliance on IT has been found to weaken relationships that are critical to coordination in uncertain, interdependent, and time-constrained environments.<sup>28</sup>

More fundamentally, organizational efforts to

increase structural integration may at times be misaligned with what patients perceive as integrated care. For example, the lack of higher perceptions of integrated care in hospital-owned groups, compared to other groups, is consistent with previous research suggesting that hospital and medical group ownership changes are often driven by market power and financial consolidation instead of changes in care practices.<sup>29</sup>

From a practical perspective, our findings indicate that health care practitioners and policy makers should not assume that structural integration of provider practices will yield care improvements for people with multiple chronic illnesses. Rather, providers and policy makers should focus on the conditions and strategies that enable structurally integrated organizations to capitalize on their ability to deliver care that is more integrated. Similarly, future research and policy should focus on the conditions and strategies that enable less structurally integrated systems to deliver more integrated care even

without the benefits of scale and scope.

The perspective offered by our study is particularly important in consideration of recent policy efforts to increase integration through accountable care organizations (ACOs) and patient-centered medical homes. For ACOs, it is important to look beyond structural changes to identify mechanisms that enable the delivery of truly integrated care that improves patient health. For patient-centered medical homes, implementing new processes alone may be insufficient, if the underlying mechanisms that enable care integration across the medical home's components are not considered. For both, structural change may be necessary but insufficient for integrating care. A deeper understanding of—and greater investment in—innovation implementation capabilities may also be required.<sup>30</sup> For example, to overcome cross-specialty coordination challenges, multispecialty medical groups may need to invest in promoting information exchange and aligning workflows.

Additionally, medical groups may need to identify potential divestments as well as invest-

ments to avoid continuing to perform engrained activities that distract providers from integrating care. For example, medical groups that implement care management practices might place less importance on autonomous decision making in favor of collective goal setting and performance management.

## Conclusion

Motivation to deliver care that patients perceive to be integrated may grow as providers assume increasing financial risk and as the burden of chronic disease rises because of the aging of the population. Medical groups may continue their efforts to achieve structural integration. It will be critical to monitor these structural integration efforts to determine whether they translate into care that patients actually perceive as integrated, and further research on the mechanisms that underlie integrated care is needed. The patient-centered measures of integrated care presented in this study can assist medical groups and policy makers in their monitoring efforts. ■

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## NOTES

- Blumenthal D, Abrams MK. Tailoring complex care management for high-need, high-cost patients. *JAMA*. 2016;316(16):1657–8.
- Bodenheimer T, Chen E, Bennett HD. Confronting the growing burden of chronic disease: can the U.S. health care workforce do the job? *Health Aff (Millwood)*. 2009;28(1):64–74.
- Cubanski J, Swoope C, Boccuti C, Jacobson G, Sallillas G, Griffin S, et al. A primer on Medicare: key facts about the Medicare program and the people it covers [Internet]. Menlo Park (CA): Henry J. Kaiser Family Foundation; 2015 Mar [cited 2017 Mar 14]. Available from: <http://files.kff.org/attachment/report-a-primer-on-medicare-key-facts-about-the-medicare-program-and-the-people-it-covers>
- Fryer AK, Friedberg MW, Thompson RW, Singer SJ. Achieving care integration from the patients' perspective: results from a care management program. *Healthc (Amst)*. 2016;4(1):36–44.
- Burns LR, Goldsmith JC, Sen A. Horizontal and vertical integration of physicians: a tale of two tails. *Adv Health Care Manag*. 2013;15:39–117.
- Shortell SM, Gillies RR, Anderson DA, Erickson KM, Mitchell JB. Re-
- making health care in America: the evolution of organized delivery systems. 2nd ed. San Francisco (CA); Jossey-Bass; 2000.
- Solberg LI, Asche SE, Shortell SM, Gillies RR, Taylor N, Pawlson LG, et al. Is integration in large medical groups associated with quality? *Am J Manag Care*. 2009;15(6):e34–41.
- Neprash HT, Chernew ME, Hicks AL, Gibson T, McWilliams JM. Association of financial integration between physicians and hospitals with commercial health care prices. *JAMA Intern Med*. 2015;175(12):1932–9.
- McWilliams JM, Chernew ME, Zaslavsky AM, Hamed P, Landon BE. Delivery system integration and health care spending and quality for Medicare beneficiaries. *JAMA Intern Med*. 2013;173(15):1447–56.
- Singer SJ, Burgers J, Friedberg M, Rosenthal MB, Leape L, Schneider E. Defining and measuring integrated patient care: promoting the next frontier in health care delivery. *Med Care Res Rev*. 2011;68(1):112–27.
- Singer SJ, Friedberg MW, Kiang MV, Dunn T, Kuhn DM. Development and preliminary validation of the Patient Perceptions of Integrated Care survey. *Med Care Res Rev*. 2013;70(2):143–64.
- For example, whereas the Consumer Assessment of Healthcare Providers and Systems focuses on integration within the medical office, our survey makes it possible to assess integration across groups, such as specialists and primary care providers.
- Physicians Foundation. 2014 survey of America's physicians [Internet]. Columbia (SC): Physicians Foundation; 2014 [cited 2017 Mar 31]. Available from: [http://www.physiciansfoundation.org/uploads/default/2014\\_Physicians\\_Foundation\\_Biennial\\_Physician\\_Survey\\_Report.pdf](http://www.physiciansfoundation.org/uploads/default/2014_Physicians_Foundation_Biennial_Physician_Survey_Report.pdf)
- Wiley JA, Rittenhouse DR, Shortell SM, Casalino LP, Ramsay PP, Bibi S, et al. Managing chronic illness: physician practices increased the use of care management and medical home processes. *Health Aff (Millwood)*. 2015;34(1):78–86.
- To access the Appendix, click on the Appendix link in the box to the right of the article online.
- Bergeson SC, Gray J, Ehrmantraut LA, Laibson T, Hays RD. Comparing web-based with mail survey administration of the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Clinician and Group Survey. *Prim Heal Care*. 2013;3.

- 17 Elliott MN, Edwards C, Angeles J, Hambarsoomians K, Hays RD. Patterns of unit and item nonresponse in the CAHPS® Hospital Survey. *Health Serv Res.* 2005; 40(6 Pt 2):2096-19.
- 18 Hays RD, Shaul JA, Williams VS, Lubalin JS, Harris-Kojetin LD, Sweeny SF, et al. Psychometric properties of the CAHPS 1.0 survey measures. *Med Care.* 1999; 37(3, Suppl):MS22-31.
- 19 Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers Soc Psychol.* 1994;67(6): 1063-78.
- 20 Carver CS, Scheier MF, Segerstrom SC. Optimism. *Clin Psychol Rev.* 2010;30(7):879-89.
- 21 For example, for the technological capabilities index, each of the nineteen questions about the availability, access, and use of an electronic health record; the use of e-prescribing; and the use of electronic registries for selected diseases was worth one point on the score.
- 22 Tollen L (Kaiser Permanente Institute for Health Policy; Oakland, CA). Physician organization in relation to quality and efficiency of care: a synthesis of recent literature [Internet]. New York (NY): Commonwealth Fund; 2008 Apr [cited 2017 Mar 15]. (Commonwealth Fund Pub. No. 1121). Available from: [http://www.commonwealthfund.org/~media/files/publications/fund-report/2008/apr/physician-organization-in-relation-to-quality-and-efficiency-of-care-a-synthesis-of-recent-literatu/tollen\\_physician\\_org\\_quality\\_efficiency\\_1121-pdf.pdf](http://www.commonwealthfund.org/~media/files/publications/fund-report/2008/apr/physician-organization-in-relation-to-quality-and-efficiency-of-care-a-synthesis-of-recent-literatu/tollen_physician_org_quality_efficiency_1121-pdf.pdf)
- 23 Agency for Healthcare Research and Quality. The CAHPS clinician and group survey database: how results are calculated [Internet]. Rockville (MD): AHRQ; 2015 Jun [cited 2017 Mar 15]. Available from: [https://cahpsdatabase.ahrq.gov/cahpsidb/Public/Files/Doc4\\_How\\_Results\\_are\\_Calculated\\_CG\\_2014.pdf](https://cahpsdatabase.ahrq.gov/cahpsidb/Public/Files/Doc4_How_Results_are_Calculated_CG_2014.pdf)
- 24 Solon G, Haider SJ, Wooldridge JM. What are we weighting for? *J Hum Resour.* 2015;50(2):301-16.
- 25 Benjamini Y, Hochberg Y. Controlling the false discovery rate: a practical and powerful approach to multiple testing. *J R Stat Soc Series B Stat Methodol.* 1995;57(1):289-300.
- 26 Miller LE, Smith KL. Handling nonresponse issues. *J Ext.* 1983; 21(5):45-50.
- 27 Martsolf GR, Alexander JA, Shi Y, Casalino LP, Rittenhouse DR, Scanlon DP, et al. The patient-centered medical home and patient experience. *Health Serv Res.* 2012; 47(6):2273-95.
- 28 Gittel JH. Organizing work to support relational co-ordination. *Int J Human Res Manage.* 2000;11(3): 517-39.
- 29 Budetti PP, Shortell SM, Waters TM, Alexander JA, Burns LR, Gillies RR, et al. Physician and health system integration. *Health Aff (Millwood).* 2002;21(1):203-10.
- 30 Singer S, Shortell SM. Implementing accountable care organizations: ten potential mistakes and how to learn from them. *JAMA.* 2011;306(7): 758-9.



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