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### Title

Adoption of Patient Engagement Strategies by Physician Practices in the United States.

### Permalink

<https://escholarship.org/uc/item/659922xm>

### Journal

Medical Care, 60(9)

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### Publication Date

2022-09-01

### DOI

10.1097/MLR.0000000000001748

Peer reviewed



# HHS Public Access

Author manuscript

*Med Care*. Author manuscript; available in PMC 2023 September 01.

Published in final edited form as:

*Med Care*. 2022 September 01; 60(9): 691–699. doi:10.1097/MLR.0000000000001748.

## Adoption of Patient Engagement Strategies by Physician Practices in the United States

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### Abstract

**Background:** Patient engagement strategies can equip patients with tools to navigate treatment decisions and improve patient-centered outcomes. Despite increased recognition about the importance of patient engagement, little is known about the extent of physician practice adoption of patient engagement strategies nationally.

**Methods:** We analyzed data collected from the National Survey of Healthcare Organizations and Systems (NSHOS) on physician practice adoption of patient engagement strategies. Stratified-cluster sampling was used to select physician practices operating under different organizational structures. Multivariable linear regression models estimated the association of practice ownership, health information technology functionality, use of screening activities, patient responsiveness, chronic care management processes, and the adoption of patient engagement strategies, including shared decision-making, motivational interviewing, and shared medical appointments. All regression models controlled for participation in payment reforms, practice size, Medicaid revenue percentage, and geographic region.

**Results:** We found modest and varied adoption of patient engagement strategies by practices of different ownership types, with health system-owned practices having the lowest adoption of ownership types. Practice capabilities, including chronic care management processes, routine screening of medical and social risks, and patient care dissemination strategies were associated with greater practice-level adoption of patient engagement strategies.

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**Conflicts of interest:** The authors declare no conflict of interest.

**Conclusions:** This national study is the first to characterize the adoption of patient engagement strategies by U.S. physician practices. We found modest adoption of shared decision-making and motivational interviewing, and low adoption of shared medical appointments. Risk-based payment reform has the potential to motivate greater practice-level patient engagement, but the extent to which it occurs may depend on internal practice capabilities.

### Keywords

Healthcare systems; care management; organizational change; organizational innovation; diffusion of innovation; practice ownership; patient participation; chronic disease

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### Introduction

Improving patient engagement has been central to policy initiatives in the U.S., including the creation of the Center for Medicare and Medicaid Innovation and the Patient-Centered Outcomes Research Institute under the Affordable Act.<sup>1</sup> The National Academy of Medicine has highlighted the importance of actively encouraging patients to be the source of control in their care and enabling high-performing patient-centered care teams.<sup>2</sup> Patient engagement strategies including shared decision-making (SDM), motivational interviewing, and shared medical appointments (SMAs) can equip patients with tools to navigate treatment decisions, increase treatment adherence, and improve patient-centered outcomes.<sup>3–11</sup> Despite increased recognition about the importance of patient engagement for the U.S. health care system, little is known about the extent of physician practice adoption of patient engagement strategies nationally.

Patient engagement strategies require technical and relational capabilities to implement effectively.<sup>12,13</sup> SDM strategies involve informing patients of their options, supporting them to compare those options, and then make choices that are aligned with their informed goals and values.<sup>3,8,14,15</sup> Decision aids provide objective information on benefits/harms to help patients clarify their values and make preference-aligned decisions.<sup>6,8,16</sup> The use of SDM requires sufficient time for staff training, workflow adaptations, and robust health information technology (HIT) to enable prompts for SDM processes.<sup>17,18</sup> Motivational interviewing involves patient-centered prioritization techniques to support patients with goal-setting for behavior change.<sup>5,19</sup> Practices adopting motivational interviewing can benefit from training, corrective feedback, a strong follow-up system, and monitoring of goals.<sup>19–21</sup> SMAs are medical encounters where clinicians simultaneously meet with multiple patients, reinforcing self-management education and medication management as patients learn from the experiences and treatment of peers.<sup>22–24</sup> SMAs have been found to improve self-management of chronic conditions, but complex logistics inhibit widespread adoption.<sup>25</sup>

Past research has conceptualized physician decision-making as influenced by multilevel factors, including their individual clinical judgement, local practice setting, affiliation with larger networks and organizations, and the market environment.<sup>26,27</sup> While physicians and staff may directly engage patients, practices can support patient engagement by investing in motivational interview training, developing shared decision-making tools, and

organizing logistically complex shared medical appointments. We extended and tailored the conceptual model of physician decision-making by Reschovsky and colleagues to inform our examination of practice adoption of patient engagement strategies. Our adapted conceptual model (Figure) depicts the organizational capabilities and external incentives that influence more extensive practice adoption of patient engagement strategies.

We focus on strategies to engage patients in their own clinical care, including motivational interviewing, SDM, and SMAs, and illustrate how innovation characteristics can influence practice-level adoption of patient engagement strategies.<sup>28</sup> These strategies were prioritized for research because of their importance for engaging patients with a range of health problems and conditions. Previous research has found that SMAs are an innovative strategy with accumulating evidence of their implementation and effectiveness<sup>22</sup> and that motivational interviewing and SDM are core strategies to guide patient preference-aligned health and treatment decisions.<sup>11</sup>

Informed by our conceptual model and prior research on adoption of chronic care management processes and patient-centered practices,<sup>29–33</sup> we examined two hypotheses in a nationally representative survey of U.S. physician practices. First, we hypothesized that physician practices with more HIT functionality, more chronic care management processes, a greater number of internal patient care dissemination strategies, a larger count of medical and social risk factors screening, and more processes to support patient responsiveness will also adopt more patient engagement strategies compared to physician practices with fewer capabilities.

Evidence from the implementation of the Patient-Centered Medical Home (PCMH) model and chronic care management processes highlight specific organization capabilities that could support physician practice adoption of patient engagement strategies. Chronic care management processes are structural capabilities for delivering chronic care as compared to patient engagement strategies which are more interpersonally focused interventions.<sup>34,35</sup> Greater use of chronic care management practices may be positively associated with the adoption of patient engagement strategies because they provide a strong foundation to measure clinician performance and target patients for engagement using information from disease registries.

Routine screening for medical and social risks provides opportunities to engage patients to resolve their needs, including using motivational interviewing for health behavior change and SMAs for patients sharing common screened risks. Greater HIT functionality may promote patient engagement, as HIT has been linked to greater adoption of chronic care management processes and broader screening of patient medical and social risks.<sup>29,30,36</sup> Similar to previous research that found that an increased emphasis on patient-centered care was positively associated with the adoption of care management processes and perceived team effectiveness, practices that emphasize patient-centered care may adopt more patient engagement strategies.<sup>37,38</sup> Practices that are more responsive to patients' needs and promptly respond to patients' complaints may be better able to involve patients using patient engagement strategies, facilitating practice adoption.

Second, we hypothesized that physician practices owned by hospitals or health care systems adopt more patient engagement strategies compared to independent physician practices because systems can support practices with infrastructure and slack resources that support adoption of patient-centered innovations. Previous research found more robust infrastructure for implementing chronic care management processes in practices owned by a larger health system.<sup>31,32,39,40</sup> Health care system-owned physician practices may benefit from organizational slack, or extra resources to draw upon in innovation, including available staff and equipment.<sup>41</sup> Health care systems may facilitate human resource intensive strategies by redeploying employees to aid with implementation rather than hiring staff for each practice site. In contrast, it may be that health care system infrastructure is necessary but insufficient to aid routine implementation of interpersonally intensive patient engagement strategies, including SDM, motivational interviewing, and SMAs. Health care systems may also constrain practice adoption of innovations through more structured and regulated operations that allow for less experimentation, resulting in lower adoption compared to independently owned practices that have relatively more autonomy to adopt patient engagement strategies.<sup>33</sup>

## Methods

We analyzed data collected from the National Survey of Healthcare Organizations and Systems (NSHOS) on the adoption of patient engagement strategies in physician practices. NSHOS was a nationally representative survey administered between 2017–2018 to primary care practice sites. The practice sample was drawn from an IQVIA OneKey database, and we restricted the outgoing sample to primary care or multi-specialty medical practices with three or more primary care physicians. A stratified-cluster sampling design was used to select physician practices operating under different ownership and composition structures, such as independent and system-owned physician practices. Details about NSHOS sampling are described in detail elsewhere.<sup>42</sup> A knowledgeable key informant at each practice, often the physician chief or practice manager, responded to survey questions. NSHOS included content from the National Study of Physician Organizations (fielded three times over the last 15 years) and new measures of patient engagement strategies tested using cognitive interviews of health system leaders and physicians. From 2,333 total responses (response rate=47%), we excluded duplicate surveys and those with high non-response on key study questions, which resulted in an analytic sample of 2,190 physician practices.

## Outcome Measures

The study outcomes were four composite measures of patient engagement strategy adoption: 1) shared decision-making, 2) motivational interviewing, 3) shared medical appointments, and 4) overall patient engagement strategies.

The SDM composite included 10 items that assessed how many physicians and staff are formally trained in SDM, routinely engage in SDM, routinely use decision aids, and follow-up on patients' treatment decisions after initial discussion of treatment tradeoffs. Further, they reported how many eligible patients received decision aids for selecting medication for diabetes, osteoarthritis treatment (hip or knee replacement), breast cancer screening,

colorectal cancer screening, and lung cancer screening. The composite scale was calculated by averaging the ten ordinal item responses scored as: “none” (0), “some” (33.3), “most” (66.6), and “all” (100) (range=0–100; internal consistency reliability  $\alpha=0.93$ ).

The motivational interviewing composite consisted of questions that assessed the extent of formal training and routine use of five motivational interviewing strategies. Formal training responses were scored: “no” 0, “yes, clinicians or staff only” (50), and “yes, both clinicians and staff” (100). Items regarding the routine use of motivational interviewing for smoking cessation, weight loss, physical activity, and medication adherence were scored: “no” (0) and “yes” (100). The composite scale was calculated by averaging the five item responses (range=0–100;  $\alpha=0.93$ ).

The SMA composite assessed the use and breadth of practice adoption of SMAs for five clinical subpopulations. Practices reported whether their SMAs focused on cardiovascular disease, chronic obstructive pulmonary disease/asthma, diabetes, or advanced directives. A composite scale was calculated by averaging SMA use and breadth items scored: “no” (0) and “yes” (100) (range=0–100;  $\alpha=0.86$ ).

The fourth study outcome was a composite measure of overall adoption of patient engagement strategies, which included the unweighted average of the motivational interviewing, SDM, and SMA composites (range=0–100;  $\alpha=0.90$ ).

### Independent Variables

Physician practice ownership types included a larger physician group, hospital or health care system, Federally Qualified Community Health Center (FQHC), independently owned, or other ownership types.

We included multiple measures of organizational capabilities. Basic HIT functionality was calculated based on the unweighted average of responses to six questions assessing electronic health record (EHR) functionality, including clinician notification that a patient was admitted to a local hospital or emergency department (range=0–100;  $\alpha=0.86$ ). An advanced HIT functionality index was calculated as a count (0–5) of five potential EHR functionalities allowing patient involvement, including patient medical record access and physician-patient email.

We measured the use of chronic care management processes as a composite scale of 23 potential processes (clinical decision-support tools, patient registries, and the measurement of individual clinician performance), each scored: “No” (0) and “Yes” (100) (range=0–100;  $\alpha=0.95$ ). We measured screening activity by calculating the average of 13 possible patient medical and social risks screened (e.g., tobacco use, housing instability, and transportation needs), each scored: “No” (0) and “Yes” (100) (range=0–100;  $\alpha=0.84$ ). Internal patient care dissemination strategies were measured from the use of six organizational processes to disseminate best patient care practices: regular staff meetings, listserv emails, departmental champions, an electronic database of practice/system endorsed guidelines, embedded decision support tools, and performance improvement events (e.g., LEAN Kaizen training) (range=0–100;  $\alpha=0.75$ ).

To measure patient responsiveness, we included a measure adapted from the National Malcolm Baldrige Quality Award criteria assessing “consumer-focused organizations.” Physician practices reported whether they agreed: they did a good job of assessing patient needs, they promptly resolved patient complaints, patients’ complaints were assessed, and the practice used data from patients to improve care. A patient responsiveness composite was calculated as the average of all item responses scored on a 5-point Likert scale ranging from “strongly disagree” (0) to “strongly agree” (100) (range=0–100;  $\alpha=0.79$ ).

### Covariates

Previous studies found positive associations between external incentives (e.g., payment reform) and the adoption of chronic care management processes and patient-centered practices.<sup>29,43</sup> We included a count (range: 0–4) of practice participation in four risk-based payment reform initiatives: capitated contracts with commercial health plans, Medicare **Accountable Care Organization** (ACO) risk bearing contracts (Pioneer, Next Gen, Medicare Shared Savings Program track three), Medicaid ACO contracts, and commercial ACO contracts. We also control for practice size (number of physicians), percentage of practice revenue from Medicaid, and U.S. census region.

### Analyses

Descriptive statistics were used to compare unadjusted adoption rates for each of the patient engagement strategies and physician practice characteristics across the five ownership types. We tested for significant differences in the study variables between ownership types, using Chi-square tests for categorical variables and ANOVA tests for continuous variables.

We estimated four multivariable linear regression models to examine the association of practice ownership, basic/advanced HIT, use of screening activities, patient responsiveness, chronic care management processes, and the adoption of: 1) Overall patient engagement strategies, 2) SDM strategies, 3) motivational interviewing strategies, and 4) SMAs. All regression models controlled for participation in payment reforms, practice size, Medicaid revenue percentage, and geographic region. All continuous covariates were standardized with a mean of 0 and a variance of 1 to improve the legibility and comparability of regression coefficients.

We conducted collinearity and model fit diagnostics for multivariable models. We calculated Variance Inflation Factors (VIFs) for each independent variable, with values greater than 2.0 indicating collinearity. We computed Pearson correlation coefficients for study covariates and considered correlations above 0.60 as highly correlated. Because SMAs had low overall adoption, we estimated a logistic model predicting the adoption of any SMAs (0, 1) as a sensitivity analysis. We conducted a Harman single factor test for all survey items to assess potential common method bias because both independent and dependent study variables were sourced from the same survey.<sup>44</sup> All analyses accounted for the complex survey design and differential sampling probabilities and non-response using weights.<sup>42</sup>



## Results

Nearly half of physician practices were owned by a health system (46.48%), followed by independently owned (25.8%), owned by an FQHC (13.34%), owned by a larger physician group (11.1%), and other forms of ownership (2.28%) (Table 1). The mean number of payment reform initiatives participated by practices was 1.3, with independently owned practices participating in the least (overall: mean=1.3, standard deviation (SD)=1.3; independently owned: mean=1.0, SD=1.0). All organizational capabilities were significantly different across ownership types ( $p$ -value<0.001), except for basic HIT (overall: mean=68.6, SD=20.5,  $p$ =0.38).

Overall adoption of patient engagement strategies was low, but adoption levels varied by practice ownership (overall: mean=33.7, SD=21.4,  $p$ -value<0.001) (Table 2). In unadjusted analyses, adoption of motivational interviewing (overall: 43.7, SD=37.3) and SDM were modest (overall: 42.1, SD=24.6) and significantly different across ownership types ( $p$ -value<0.001). Roughly half of physician practices provided motivational interviewing training, 22.7% for clinicians only and 16.9% for both clinicians and staff. The extent of SDM training (overall: mean=39.3, SD=33.8) was lower than the routine use of SDM by clinicians (overall: mean=52.3, SD=29.5). SMAs were the least adopted strategy (overall: mean=15.3, SD=28.8); 23.9% of physician practices routinely used any SMAs, which varied across ownership types ( $p$ -value=0.001). Diabetes was the most common clinical focus area for SMAs, available in 10.8% of physician practices.

In multivariable regression analyses, chronic care management processes ( $\beta$ =3.81,  $p$ <0.001), routine screening of medical and social risks ( $\beta$ =5.31,  $p$ <0.001), and internal patient care dissemination strategies ( $\beta$ =4.86,  $p$ <0.001) were strongly associated with more extensive practice-level adoption of patient engagement strategies (Table 3). Basic ( $\beta$ =1.81,  $p$ =0.001) and advanced ( $\beta$ =1.30,  $p$ =0.02) HIT functionality were also significantly associated with greater adoption of patient engagement strategies, but processes to support patient responsiveness were not. Health system-owned practices adopted fewer patient engagement strategies compared to all other practice ownership types. Compared to physician practices with 20+ physicians, smaller physician practices with 4–7 physicians ( $\beta$ =−5.98,  $p$ <0.001) and 13–19 physicians ( $\beta$ =−6.74,  $p$ =0.001) adopted fewer patient engagement strategies.

Statistically significant regression model coefficients were consistent across the three types of patient engagement strategies assessed, with some notable exceptions. Patient responsiveness ( $\beta$ =2.35  $p$ <0.001) was associated with greater use of SDM strategies. Advanced HIT was not associated with SDM adoption, and both basic and advanced HIT were not associated with SMA adoption. Physician practices with no Medicaid revenue had greater adoption of SDM strategies ( $\beta$ =4.97,  $p$ =0.01) and fewer SMAs ( $\beta$ =−4.50,  $p$ =0.03) compared to physician practices with low (1–29%) Medicaid revenue. Payment reform participation was associated with greater use of SDM strategies, but not other strategies ( $\beta$ =1.53,  $p$ =0.02).

All variable VIFs were less than 2.0, indicating that variables in the final regression models were not collinear. In sensitivity analyses, estimates of a multivariable logistic



model estimating physician practice adoption of any SMAs yielded similar findings to the multivariable linear regression model for the SMAs composite measure, except the significant association of Medicaid revenue and SMAs attenuated in the logistic regression model (Supplementary Table 1). The Harman single factor test for all survey items explained 35% of the variance.

## Discussion

Despite increased interest in improving patient engagement in health care, patient engagement strategies had varying uptake in U.S. physician practices. Few U.S. physician practices offered clinician or staff training for motivational interviewing and SDM processes, decision aids to support SDM were inconsistently available for patients, and SMAs were adopted by only 24 percent of practices.

Supporting hypothesis 1, we found multiple organizational capabilities to be positively associated with practice adoption of patient engagement strategies, including more HIT functionality, chronic care management processes, risk screening, and internal patient care dissemination strategies. Routine care management and risk screening, in particular, enable regular opportunities to engage patients on identified needs, such as cueing conversations about recently documented smoking habits using motivational interviewing techniques.<sup>45</sup> Practices with a broad range of evidence dissemination strategies can use multiple methods to spread best practices and share implementation resources, including clinical champions,<sup>46</sup> on-site trainings, and web-based refresher courses.<sup>13</sup>

We found that practices with more processes in place to support patient responsiveness adopted SDM to greater degrees, but not other strategies. Practices with systems in place to proactively respond to patients' needs may be better prepared to overcome the complex collaborative processes of SDM, which are focused on informed patient treatment decisions.<sup>47</sup> This is in contrast to motivational interviewing, which is centered on goal-setting and monitoring of specific behavior changes prioritized by patients.<sup>11</sup> These processes to respond to patients' needs may not help practices overcome the logistical complexity of adopting SMAs.<sup>25</sup> Taken together, building organizational capabilities may improve practice capacity to adopt new innovations, learn from implementation experiences, and better understand the needs of patients they are trying to engage.

Health system-owned practices had the lowest adoption levels of all ownership types, counter to Hypothesis 2. These findings are in stark contrast with previous evidence that health care and hospital system ownership supported the adoption of chronic care management processes.<sup>31,32,39,40</sup> Health system resources such as shared information systems and access to capital may improve practice-level capabilities to care for patients, but system ownership may be less helpful for helping practices overcoming complex interpersonal barriers associated with the implementation of patient engagement strategies. Our finding that larger practices adopt more patient engagement strategies is consistent with prior studies of patient-centered medical home processes and high-intensity patient engagement.<sup>32,48</sup> Larger practices may be able to pool resources and offer opportunities for intra-organizational learning without having to be owned by a health system.

Our results also highlight that practices owned by physician groups or FQHCs adopted more patient engagement strategies than system-owned practices. FQHCs had the most extensive use of motivational interviewing compared to other ownership types. In addition to using motivational interviewing strategies for a wider range of clinical foci, these efforts were bolstered by high levels of clinician/staff training. FQHCs are valued partners of ACOs and health systems because of their expertise with managing high-cost, high-need populations that can benefit from motivational interviewing and other patient engagement strategies.<sup>49</sup> Our results suggest that practices caring for patients struggling with low health literacy and with more social risk factors may be most inclined to adopt innovative strategies to engage patients in their own care.<sup>48</sup>

Payment reform, a control variable, was associated with greater adoption of SDM, but not other strategies. One reason why payment reform may be associated with greater SDM adoption is because SDM is required for organizations participating in the Medicare Shared Savings Program.<sup>50</sup> Similar requirements for the use of motivational interviewing and SMAs could encourage practice-level adoption of these strategies.

Our study has several limitations. First, NSHOS was completed by single respondents from each organization assessed and they may have overreported adoption of patient engagement strategies because of social desirability response bias. The respondents, however, were selected for their experience, knowledge, and understanding of organizational processes and the level of organizational adoption of patient engagement strategies reported was moderate. Second, we assessed organizational adoption of motivational interviewing, SDM, and SMAs because they focus on patient engagement in their own health care, but do not assess their impact. A broader range of strategies, including patient advisory councils, and the association of organizational adoption of these strategies with patient-level outcomes should be examined in future research. Third, there is a possibility of common method bias because both independent and dependent study variables were sourced from the same survey.<sup>44</sup> While respondent bias cannot be ruled out, the results of our Harman single factor test indicate a lack of common method variance. Fourth, we do not assess causal relationships because the analyses are cross-sectional, so we cannot fully account for unmeasured non-response biases that may impact results. To address potential biases, we include a robust set of covariates in our regression models and include non-response and sampling weights.<sup>42</sup> Finally, we were not able to isolate the specific roles that the survey respondents considered when reporting staff or clinician involvement. Future research should clarify the team members leading the routine use of patient engagement strategies.

## Conclusion

This national study, the first to characterize the adoption of patient engagement strategies by U.S. physician practices, identified the organizational capabilities most strongly associated with their adoption, which include HIT functionality, chronic care management processes, routine social risk and clinical screening, and patient care dissemination strategies. Overall, we found modest adoption of SDM and motivational interviewing, and low adoption of SMAs. The results suggest that external incentive programs, such as ACOs and risk-based payment reform initiatives, have the potential to motivate greater physician practice

engagement with their patients, but the extent to which it occurs may depend on internal practice capabilities.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgements:

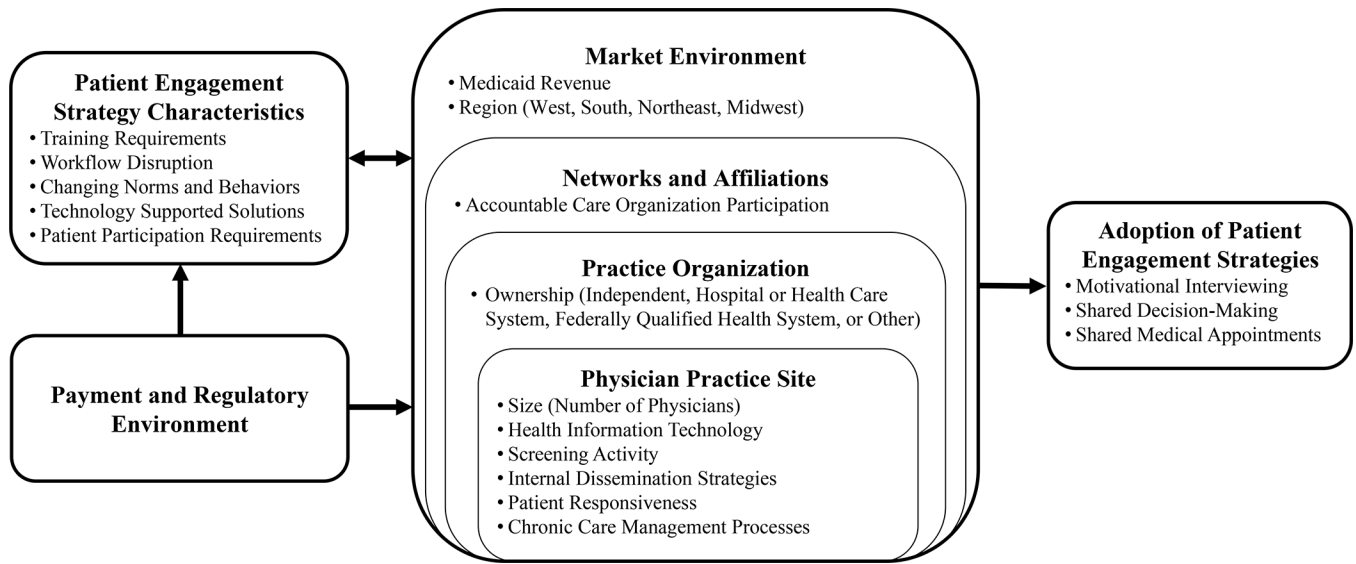
This study was supported by the Agency for Healthcare Research and Quality's (AHRQ's) Comparative Health System Performance Initiative under Grant # 1U19HS024075, which examines how health care delivery systems promote evidence-based practices and patient-centered outcomes research in delivering care. The statements, findings, conclusions, views, and opinions contained and expressed in this article are based in part on data obtained under license from IQVIA information services: OneKey subscription information services 2010–2017, IQVIA incorporated all rights reserved. The statements, findings, conclusions, views, and opinions contained and expressed herein are not necessarily those of IQVIA Incorporated or any of its affiliated or subsidiary entities. Dr. Miller-Rosales was supported by the National Institute of Mental Health (NIMH) under training grant T32MH019733.

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**Figure:** Conceptual Model: Organizational Capabilities and External Incentives that Influence More Extensive Adoption of Patient Engagement Strategies in Physician Practices.

**Table 1:**

Characteristics of Physician Practices Stratified by Ownership Type, Weighted (2017/2018)

	Overall	Independent	Larger Physician Group	Federally Qualified Health Center	Hospital or Health Care System	Other	p-value
<b>n (% of organizations)</b>	2190	565 (25.8%)	243 (11.1%)	314 (13.34%)	1,018 (46.48%)	50 (2.28%)	
<b>Organizational Capabilities, mean (SD)</b>							
Basic Health Information Technology	68.6 (20.5)	70.6 (19.0)	66.8 (23.8)	67.6 (18.5)	68.2 (21.5)	65.6 (20.2)	0.38
Advanced Health Information Technology	2.9 (1.4)	2.5 (1.4)	3.2 (1.4)	2.9 (1.4)	3.1 (1.3)	2.8 (1.2)	<0.001
Screening Activity	54.2 (25.5)	51.6 (21.7)	55.3 (28)	65.8 (24.2)	51.2 (26.5)	54.8 (26)	<0.001
Internal Dissemination Strategies	63.3 (31.4)	47 (29.1)	71.7 (30.4)	73.2 (24.6)	68.8 (31.7)	64.1 (27.7)	<0.001
Patient Responsiveness	76.9 (16.2)	79.1 (13.9)	78.1 (17.6)	75.9 (15.4)	75.2 (17.6)	81.9 (13.2)	<0.001
Chronic Care Management Processes	49.3 (33.3)	43.9 (33.7)	56.9 (35.8)	56.6 (29.5)	48.6 (33.1)	48.5 (28.3)	<0.001
<b>Payment Reform, mean (SD)</b>	1.3 (1.3)	1 (1)	1.6 (1.4)	1.4 (1.3)	1.5 (1.4)	1.7 (1.4)	<0.001
<b>Medicaid Revenue, %</b>							
None (0%)	13.2	27.3	16.1	3.8	7.6	12	<0.001
Low (1–33%)	65	63.9	69.6	48.7	69.5	66	
High (33% or above)	21.9	8.9	14.4	47.5	23	22	
<b>Practice Size, %</b>							
0–3 physicians	24.6	34.2	23.1	18.2	21.6	26	<0.001
4–7 physicians	38.6	43.5	32.5	34.1	38.6	40	
8–12 physicians	15.1	12.9	9.9	19.1	16.3	16	
13–19 physicians	7.6	3.5	10.3	14	7.6	2	
20+ physicians	14.1	5.8	24.3	14.7	15.9	16	
<b>Region, %</b>							
West	25	23.2	37	32.5	20.4	34	<0.001
South	28.8	20.5	21.4	23.6	37.2	20	
Northeast	19.8	22.1	15.6	22.3	19.1	12	
Midwest	26.4	34.2	25.9	21.7	23.3	34	

Source: National Survey of Healthcare Organizations and Systems (NSHOS). Results are weighted and displayed as percentages for binary variables and mean (standard deviation) for continuous variables. P-value represents statistically significant differences in the variable across ownership types using Chi-square tests for categorical variables and ANOVA tests for continuous variables.



**Table 2:**

Adoption of Patient Engagement Strategies Among Physician Practices of Different Ownership Types, Weighted (2017/2018)

	Overall	Independent	Larger Physician Group	Federally Qualified Health Center	Hospital or Health Care System	Other	p-value
<b>Overall Patient Engagement Composite, mean (SD)</b>	33.7 (21.4)	31.9 (18.3)	39.5 (27.8)	41.6 (21.3)	30.7 (21.0)	33.3 (20.6)	<0.001
<b>Motivational Interviewing Composite, mean (SD)</b>	43.7 (37.3)	39.2 (31.8)	47.1 (39.9)	59.0 (36.3)	40.0 (39.0)	45.8 (37.6)	<0.001
Training: None, %	55.1	63.5	50.2	36.6	57.3	54	<0.001
Training: Yes, clinicians only, %	22.7	23.4	24.7	21.3	22.7	16	
Training: Yes, staff only, %	5.3	3.9	5.8	10.2	4.4	4	
Training: Yes, both, %	16.9	9.2	19.3	31.9	15.6	26	
Area: Smoking cessation, %	58.7	58.7	59.6	69.4	54.8	53.2	0.01
Area: Weight loss, %	59.7	60.2	61.5	70.2	54.9	60.4	0.01
Area: Physical activity, %	57.2	57.2	60.1	67.6	52.6	58.4	0.01
Area: Medication adherence, %	55	56.4	57.5	65.4	49.3	56.9	0.01
<b>Shared Decision-Making Composite, mean (SD)</b>	42.1 (24.6)	43.7 (22.9)	46.8 (26.3)	42.4 (23.5)	39.8 (25.6)	43.1 (23.0)	0.03
Training	39.3 (33.8)	37.5 (32.6)	45.9 (36.6)	43.5 (30.3)	37.1 (35.1)	46.4 (31)	0.01
Routine use	52.3 (29.5)	52.4 (29.4)	55.4 (30.4)	50.3 (26.8)	52.3 (30)	52.1 (28.9)	0.68
Treatment decision follow-up	47 (29.9)	47.8 (29.4)	48.5 (30.5)	45.3 (25.9)	46.8 (31.3)	45.4 (32.7)	0.90
Decision Aids: Overall	39 (29.8)	38.4 (29.1)	44.2 (32.2)	40.4 (26.5)	37.6 (30.9)	41.8 (26.2)	0.19
Decision Aid: Diabetes medication	36.7 (31.4)	42.6 (31.3)	39.7 (34.4)	38 (27.6)	32.1 (31.3)	30.4 (27.7)	<0.001
Decision Aid: Hip/knee replacement	34.5 (31.9)	37.9 (30.5)	40.4 (34.8)	32.5 (29.2)	31.6 (32.9)	34.7 (30.2)	0.01
Decision Aid: Breast cancer screening	41.6 (34.4)	45.4 (33)	47.3 (37.2)	43.2 (31.9)	37 (35.4)	43.1 (28.2)	0.01
Decision Aid: Prostate cancer screening	42.4 (34.1)	46.2 (33.1)	46.2 (36.5)	42.4 (32)	38.7 (34.9)	46.1 (26.7)	0.02
Decision Aid: Colorectal cancer screening	44.9 (34.5)	48.4 (32.9)	51.9 (37)	45.1 (32.4)	40.9 (35.5)	44.4 (28.9)	0.01
Decision Aid: Lung cancer screening	38.8 (32.9)	39.7 (31.2)	44.6 (37.4)	38.1 (30.4)	37 (33.9)	40.5 (32)	0.20
<b>Shared Medical Appointment Composite, Mean (SD)</b>	15.3 (28.8)	12.7 (25.2)	24.6 (41.0)	23.3 (31.0)	12.27 (26.3)	11.0 (22.5)	<0.001
Any Use, %	23.9	20.0	32.0	35.9	20.4	17.8	0.001
Cardiovascular disease, %	5.6	4.7	15.7	7.7	3.4	2.9	<0.001
Diabetes, %	10.8	8.3	21.8	17.6	7.7	9.2	<0.001
Advance directives, %	5.2	4.3	14.9	8.0	2.8	1.4	<0.001
Asthma/Chronic obstructive pulmonary disease, %	5.5	4.2	14.9	9.7	2.8	2.7	<0.001

Source: National Survey of Healthcare Organizations and Systems (NSHOS). Results are weighted. Binary variables shown as percentages, continuous variables as mean (standard deviation). Shared decision-making items are a continuous measure (range: 0–100) of ordinal responses. P-value represents statistically significant differences across ownership types using Chi-square tests for binary variables and ANOVA tests for continuous variables.

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**Table 3:**

Multivariable Linear Regression Results: Association of Physician Practice Characteristics and Adoption of Patient Engagement Strategies, Weighted (2017/2018)

	Overall Patient Engagement Strategies	Shared Decision-Making	Motivational Interviewing	Shared Medical Appointments
<b>Ownership</b>				
Hospital or Health Care System	Ref.	Ref.	Ref.	Ref.
Larger Physician Group	5.31 ** (1.85)	4.01 * (1.80)	2.61 (2.92)	9.30 ** (3.12)
Federally Qualified Health Center	6.26 *** (1.62)	-0.45 (2.03)	13.16 *** (3.26)	6.06 * (2.58)
Independent	3.58 ** (1.32)	4.93 ** (1.80)	2.36 (2.59)	3.46 (2.11)
Other	1.77 (3.34)	1.77 (3.65)	5.82 (6.88)	-2.28 (3.73)
<b>Organizational Capabilities</b>				
Basic Health Information Technology	1.81 ** (0.56)	2.76 *** (0.79)	2.74 ** (1.06)	-0.07 (0.83)
Advanced Health Information Technology	1.30 * (0.57)	1.11 (0.72)	2.58 * (1.08)	0.21 (0.88)
Screening Activity	4.86 *** (0.64)	4.47 *** (0.81)	5.82 *** (1.18)	4.29 *** (0.95)
Internal Dissemination Strategies	2.71 *** (0.65)	3.11 *** (0.89)	2.34 (1.33)	2.67 ** (0.94)
Patient Responsiveness	0.77 (0.56)	2.35 *** (0.69)	1.11 (1.03)	-1.15 (0.82)
Chronic Care Management Processes	3.81 *** (0.61)	4.19 *** (0.87)	5.45 *** (1.25)	1.77 (0.96)
<b>Payment Reform Participation</b>	0.32 (0.51)	1.53 * (0.65)	0.31 (1.00)	-0.87 (0.79)
<b>Medicaid Revenue</b>				
None (0%)	-0.28 (1.52)	4.97 * (2.02)	-1.31 (3.02)	-4.50 * (2.05)
Low (1–29%)	Ref.	Ref.	Ref.	Ref.
High (30% or above)	-0.27 (1.31)	-2.51 (1.71)	0.86 (2.56)	0.84 (2.08)
<b>Physician Practice Size</b>				
0–3 physicians	-2.64 (1.65)	3.35 (2.05)	-3.94 (3.14)	-7.34 ** (2.75)
4–7 physicians	-5.98 *** (1.47)	1.93 (1.63)	-9.87 *** (2.75)	-9.99 *** (2.48)
8–12 physicians	-2.90 (1.89)	2.75 (2.08)	-4.30 (3.47)	-21.0504
13–19 physicians	-6.74 ** (2.08)	-1.47 (2.37)	-12.87 ** (4.22)	-5.89 (4.06)
20+ physicians	Ref.	Ref.	Ref.	Ref.
<b>Region</b>				
South	Ref.	Ref.	Ref.	Ref.
West	4.36 ** (1.41)	-0.10 (1.90)	4.11 (2.72)	9.06 *** (2.41)
Northeast	0.22 (1.36)	-0.71 (1.72)	1.60 (2.71)	-0.23 (2.11)
Midwest	-0.66 (1.44)	1.15 (1.76)	-4.77 (2.73)	1.63 (2.01)
<b>Intercept</b>	34.77 *** (1.54)	38.93 *** (1.84)	47.69 *** (3.00)	17.70 *** (2.48)
<b>R-squared</b>	0.31	0.26	0.20	0.12

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<b>Overall Patient Engagement Strategies</b>	<b>Shared Decision- Making</b>	<b>Motivational Interviewing</b>	<b>Shared Medical Appointments</b>
<b>Observations</b>		2190	

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Source: National Survey of Healthcare Organizations and Systems (NSHOS). Results are weighted. Standard errors are in parenthesis. All continuous measures are standardized with a mean of 0 and a variance of 1 to improve the legibility of regression coefficients.

\*  
p<0.05

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p<0.01

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p<0.001

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