

UC Berkeley

UC Berkeley Previously Published Works

Title

Multilevel influences on patient engagement and chronic care management.

Permalink

<https://escholarship.org/uc/item/9dx3r4hf>

Journal

American Journal of Managed Care, 29(4)

Authors

Miller-Rosales, Chris

Brewster, Amanda

Shortell, Stephen

et al.

Publication Date

2023-04-01

DOI

10.37765/ajmc.2023.89348

Peer reviewed



Published in final edited form as:

Am J Manag Care. 2023 April ; 29(4): 196–202. doi:10.37765/ajmc.2023.89348.

Multilevel Influences on Physician Practice Patient Engagement and Chronic Care Management

Chris Miller-Rosales, PhD, MSPH^a, Amanda L. Brewster, PhD, MSc^b, Stephen M. Shortell, PhD, MPH, MBA^b, Hector P. Rodriguez, PhD, MPH^b

^aHarvard Medical School, Department of Health Care Policy, 180A Longwood Avenue, Boston, MA 02115

^bUniversity of California, Berkeley, School of Public Health, Berkeley, CA, 2121 Berkeley Way, Berkeley, CA 94720-7360

Abstract

Objectives: Physician practices are increasingly owned by health systems, which may support innovation adoption for adults with chronic conditions. We examined health system and physician practice-level capabilities associated with adoption of 1) patient engagement strategies and 2) chronic care management processes for adult patients with diabetes and/or cardiovascular disease (CVD).

Study Design: We analyzed data collected from the National Survey of Healthcare Organizations and Systems (NSHOS), a nationally representative survey of physician practices (n=796) and health systems (n=247) (2017–2018).

Methods: Multivariable multilevel linear regression models estimated health system and physician practice characteristics associated with practice-level adoption of patient engagement strategies and chronic care management processes.

Results: Health systems with processes in place to assess clinical evidence ($\beta=6.79$, $p=0.004$) and with more advanced health information technology (HIT) functions ($\beta=2.85$, $p=0.03$) adopted more practice-level chronic care management processes, but not patient engagement strategies, compared to systems lacking these capabilities. Physician practices with cultures oriented to innovation, more advanced HIT functions, and with a process in place to assess clinical evidence adopted more patient engagement strategies and chronic care management processes.

Conclusions: Health systems may support the adoption of practice-level chronic care management processes, which have a strong evidence base for practice implementation compared to patient engagement strategies, which have less evidence to guide effective implementation. Health systems have an opportunity to advance patient-centered care by expanding practice-level advanced HIT functions and developing processes to appraise clinical evidence for physician practices.

Precis:

Corresponding author: Hector P. Rodriguez, PhD, MPH, School of Public Health, University of California, Berkeley, 2121 Berkeley Way, Berkeley, CA 94720-7360, hrod@berkeley.edu.

System-owned practices with more robust local cultural and technical capabilities adopted more patient engagement strategies and chronic care management processes.

Keywords

Patient engagement; chronic care management; health systems; diabetes; cardiovascular disease

Objectives/Introduction

Physician practices in the United States are increasingly owned by health care systems.^{1,2} Health care system ownership of physician practices has been associated with higher prices and spending,^{3,4} but systems also have the potential to improve practice capabilities to manage chronic conditions.⁵ Improving practice capabilities to manage diabetes and cardiovascular disease (CVD) is a high priority for population health because CVD is the leading cause of death in the U.S. and patients with diabetes are at increased risk of CVD.⁶

Organizational capabilities central to improving care for adults with diabetes and/or CVD include chronic care management processes and patient engagement strategies. Chronic care management processes are evidence-based processes, such as use of electronic health record (EHR) decision support tools and patient registries, with demonstrated benefit to improved outcomes for patients with diabetes and CVD.^{7,8} Health care system-owned physician practices have incentives through risk-based payment arrangements to better engage patients in their health and health care.⁹ Past research highlighted that patients with high confidence in managing their own health and health care, known as patient activation, can achieve better outcomes.¹⁰ Patient engagement strategies aim to activate patients to improve their participation in managing their own health and health care through shared decision-making, shared medical appointments, and motivational interviews.^{11–13} Shared medical appointments enable patients to learn from peers during visits where clinicians meet with multiple patients simultaneously.^{23–26} Shared decision-making is used to assist informed patients in making choices that are aligned with their goals and values.^{3,9,13,14} Motivational interviewing involves patient-centered prioritization techniques to support patients with goal-setting for behavior change.^{5,20}

Despite increased recognition of patient engagement strategies and chronic care management processes as important practice capabilities, they are not consistently adopted. On average, fewer than half of recommended chronic care management processes have been adopted by physician practices.¹⁴ Further, only one-third of family physicians work in practices with a patient advisory council or patient volunteers in quality improvement activities.¹⁵

Health care systems that own physician practices can provide implementation support to aid practice-level adoption of care delivery innovations through HIT infrastructure support and support for local champions to assist with change management.^{16,17} The relative association of health care system versus physician practice characteristics on adoption of patient engagement strategies remains unexplored. This study examines the extent to

which capabilities of systems and practices are differentially associated with the adoption of chronic care management processes and patient engagement strategies.

Conceptual Model

Health care systems can influence physician practice adoption of patient engagement strategies and chronic care management processes. Our conceptual model depicts how advancing capabilities of health care systems and their owned physician practices can improve chronic care delivery (Figure 1). We integrated concepts from diffusion of innovation,¹⁸ organizational change management,¹⁹ and previous studies of chronic care management and patient engagement strategy adoption^{14,20–22} to inform our study hypotheses.

We posit that health care systems can support practice adoption of innovations differently depending on the strength of evidence about implementation strategies to improve uptake and fidelity. Studies assessing implementation strategies provide actionable evidence about how interventions can be adapted to fit local practice needs, culture, and resources.²³ Systems can develop central capabilities when innovations have evidence-based implementation strategies or are conducive to standardization throughout the system.

Adopters of chronic care management processes may benefit from robust practice-based evidence to support effective implementation, as the adoption and implementation of these capabilities have been well-documented as part of Patient-Centered Medical Home (PCMH) implementation and the expansion of HIT in physician practices.^{16,24,25} In contrast, there are fewer large-scale efforts to integrate patient engagement strategies into routine care.^{15,26,27} Consequently, health care systems may be less likely to support the adoption of patient engagement strategies if they are disruptive to operations or compete with other priorities.

The degree to which health care systems standardize administrative and financial processes across physician practices (e.g., physician compensation and performance measurement) may influence how consistently innovations are adopted in constituent practices. Diffusion of innovations theory posits that an innovation's compatibility to organizational structure, routines, and resources can promote uptake.¹⁸ Systems with strong standardized processes may promote compatible capabilities that can be similarly deployed throughout practices consistently, such as chronic care management processes. Conversely, patient engagement typically demands extensive local customization. For example, shared medical appointments require idiosyncratic scheduling and physical space considerations.²⁸ Consequently, health care systems may have less influence on patient engagement strategies because centralized resources are less useful for adopting innovations that require local tailoring. We hypothesize that health care system standardization of administrative functions and processes, including physician compensation and strategic planning, will be positively associated with practice-level adoption of chronic care management processes for diabetes and/or CVD, but not patient engagement strategies (Hypothesis 1).

Health care systems can influence practice-level adoption of innovations beyond establishing standardized administrative processes. For example, systems can help practices establish

processes to appraise clinical evidence, provide financial resources to support infrastructure investments, and foster organizational cultures oriented to innovation and learning. Systems can also provide instrumental support through guidance and facilitation to help practices address their unique needs, including reaching priority patient populations and supporting the expansion of practice-level capabilities such as HIT and chronic care management processes.²⁹ Past research indicates that physician practices with more advanced HIT functions in place adopt more chronic care management processes.^{20,21} Further, systems can support practice cultures oriented to innovation and risk-taking, which can equip practices with the motivation and capabilities to test care delivery innovations.^{30,31} Accordingly, we hypothesize that health care systems and physician practices with processes in place to assess new clinical evidence, more advanced HIT functions, and cultures oriented to innovation will adopt more patient engagement strategies and chronic care management processes for diabetes and/or CVD compared to practices without these capabilities (Hypothesis 2).

Methods

Data Source

This study analyzed data from the National Survey of Healthcare Organizations and Systems (NSHOS), a nationally representative survey administered between 2017–2018 to U.S. primary care practice sites (N= 2,190, Response Rate=48.6%), and health care systems that owned or managed at least two primary care multi-specialty medical practices or acute care hospitals (N=325, Response Rate=60.9%). A knowledgeable key informant at each organization responded to the survey questions, including physician practice administrators/managers and health care system Chief Executive Officers or Chief Medical Officers. We linked NSHOS surveys with IQVIA One Key Data on health care system and physician practice characteristics. We integrated a subset of system-owned physician practice surveys (n=820) with responses from their corresponding health care systems (n=253). We excluded six systems with missing data on key covariates, resulting in an analytic sample of 796 physician practices and 247 health care systems. The research study was approved by the UC Berkeley Office of Human Subject Protections (2015-04-7420).

Dependent Variables

Measures of patient engagement strategies and chronic care management processes were developed based on past survey research assessing these practice capabilities.^{14,20,22,32} Psychometric analyses indicated that patient engagement strategies and chronic care management processes were distinct constructs. Exploratory factor analyses demonstrated high Eigenvalues (range: 2.39–5.79) for both constructs, high internal consistency reliability (alphas=0.82–0.86), and low correlation ($r=0.38$) between the measures.³³

A composite measure of physician practice-level adoption of twelve patient engagement strategies was calculated and transformed to a 0–100 scale (internal consistency reliability, $\alpha=0.87$). Patient engagement strategies assessed included shared medical appointments (diabetes, CVD), motivational interviewing (smoking cessation, weight loss/diet, increase in physical activity, medication adherence, training staff or clinicians), decision aids for

selecting diabetes medication, and shared decision-making (physician/staff formally trained in shared decision-making, routinely engage in shared decision-making, routinely use decisions aids, and follow-up after shared decision-making).

A composite measure of practice-level adoption of eight chronic care management processes was calculated and transformed to a 0–100 scale ($\alpha=0.82$). Chronic care management processes included use of evidence-based protocol guidelines, EHR-based clinical decision-support tools, disease registries, and individual feedback on clinician performance. The appendix includes detailed descriptions of survey items and descriptive statistics.

Health Care System Variables

Health care systems reported the degree to which seven processes were standardized (“done the same way”) across their physician practices. Processes included physician compensation, performance management of primary care physicians, primary care processes and team structure, hospital discharge planning, human resources functions, financial arrangements between the larger system and individual practices, data elements included in the EHR, and strategic planning. Responses were coded as “Not at all” 0, “Somewhat,” 33.3, “Mostly” 67.7, and “Full” 100, then we calculated a composite scale based on the average of all item responses (range=0–100; $\alpha=0.88$).

We included a dichotomous variable for whether systems had a process in place to assess new clinical evidence (Yes/No), such as internal evaluation committees to identify and review research evidence or an organized program to pilot novel interventions. Health care system culture was assessed from questions based on the Competing Values Framework, which categorized culture based on focus level (internal or external) and the degree of influence they exert on operations (controlling or flexible).³⁴ We measured culture of innovation based on points allocated to developmental/innovative culture type (range=0–100). Advanced HIT functions included patients’ ability to access and comment on their medical records and communicate via secure message (range=0–100; $\alpha=0.70$).

Physician Practice Independent Variables

We included a dichotomous variable indicating whether practices had a process in place to assess new clinical evidence (Yes/No). A composite scale assessed practice-level innovation culture based on five items describing practice culture, including successful care delivery innovations are highly publicized, and team members openly share patient care challenges and failures with each other (range=0–100; $\alpha=0.80$). Advanced HIT functions were assessed using a 5-item index (0–5).³⁵

Control Variables

Physician practice-level control variables included physician practice size (number of physicians), participation in delivery or payment reform initiatives, and geographic region. Health care system-level control variables included system size (number of physician practices), and participation in delivery or payment reform initiatives.

Statistical Analysis

Descriptive analyses on physician practice and health care system characteristics were conducted, as well as the unadjusted analyses of adoption rates of each patient engagement strategy and chronic care management process.

Multivariable linear regression models estimated the association of health care system and physician practice characteristics on practice-level adoption of patient engagement strategies and chronic care management processes. Random system effects were used to account for the clustering of physician practices in health care systems. To aid in comparison of regression coefficients, continuous measures were standardized with a mean of 0 and a variance of 1.

We calculated the Akaike information criterion (AIC) to compare the goodness of fit of the full multivariable model to two reduced form regression models containing: 1) only health care system-level variables, and 2) only physician practice-level variables, for both patient engagement strategies and chronic care management processes.

We conducted robustness checks for our final multivariable model specifications, including calculating collinearity and model overfit diagnostics. We computed the Variance Inflation Factor for each independent variable to determine whether multicollinearity was present. We checked covariates for high correlation and dropped those with correlation above 0.60. All analyses were completed using STATA 15.0.

Results

Half of health care systems owned between 1–22 physician practices (45.3%) (Table 1). Patient engagement strategies were not widely adopted by system-owned physician practices (mean=41.4, standard deviation (SD)=28.5) (Table 2). Formal training in shared decision-making (38.2%) was less available than their routine use in shared decision-making (54.3%). On average, chronic care management processes were adopted more than patient engagement strategies (mean=69.7, SD=29.9). The most adopted capability was collecting physician performance data for diabetes (85.8%).

Health care systems with a process in place to assess new clinical evidence ($\beta=6.79$ points on a 0–100 scale, $p=0.004$), and more advanced HIT functions ($\beta=2.85$ points on a 0–100 scale, $p=0.028$) had greater practice-level adoption of chronic care management processes, controlling for all model covariates (Table 3). There was no significant association between health care system characteristics and practice-level adoption of patient engagement strategies. Having a process in place to assess new clinical evidence at the physician practice level was positively associated with the adoption of patient engagement strategies ($\beta=4.44$, $p=0.01$) and chronic care management processes ($\beta=7.37$, $p<0.001$). More advanced practice-level HIT functions was positively associated with adoption of patient engagement strategies ($\beta=3.18$, $p<0.001$) and chronic care management processes ($\beta=5.59$, $p<0.001$). Practices with cultures oriented to innovation adopted more patient engagement strategies ($\beta=10.73$, $p<0.001$) and chronic care management processes ($\beta=9.70$, $p<0.001$).

Model fit for patient engagement strategies was better (lower AIC) in the full model (AIC=7204) compared to a model with only health care system-level variables (AIC=7351), and similar to a model with only physician practice-level variables (AIC=7189). Likewise, model fit for chronic care management capabilities was better in the full model (AIC=7460) compared to a model with only health care system-level variables (AIC=7653), and similar to a model with only physician practice-level variables (AIC=7462).

Discussion

Given limited evidence about how health care systems support physician practice adoption of disruptive innovations, this study highlights several modifiable health care system and physician practice capabilities associated with practice adoption of chronic care management processes and patient engagement strategies for adults with diabetes and/or CVD. Greater adoption of chronic care management processes compared to patient engagement strategies is consistent with diffusion of innovation theory, which highlights that innovation adoption can be facilitated when there is established practice-based evidence focused on effective implementation, scaling, and sustainment of the innovation,¹⁸ compared to innovations for which there is limited evidence about implementation. In this case, implementers of chronic care management processes may benefit from robust practice-based evidence, including PCMH and HIT implementation research.^{16,24,25}

Our results are also consistent with past research that underscored the role of health care systems as sources of guidance for practices, but not direct implementers of care delivery innovations,¹⁷ and as a result, local leadership and frontline team acceptance are essential to implement disruptive care delivery innovations.^{16,28} It is possible that systems opt to devote limited resources to support chronic care management processes because evidence-based implementation strategies are well developed. Patient engagement strategies that rely on high local readiness for change and a supportive implementation climate, in contrast, may be less influenced by systems because implementation strategies are not well established.³⁶

Consistent with hypothesis 1, system standardization was not associated with practice-level adoption of patient engagement strategies. However, contrary to hypothesis 1, there was no significant association of system standardization with practice adoption of chronic care management processes. Lack of associations may be due to the relatively high level of standardization of processes reported by systems (mean=73.6 out of 100, SD=19.8) or that the standardized items measured (e.g., physician compensation and performance measurement) were too distal to impact the adoption of these care delivery innovations.

We find partial support for hypothesis 2. Systems with more advanced HIT functions and processes in place to assess new clinical evidence had greater adoption of chronic care management processes, but not patient engagement strategies. The HIT functionalities assessed directly related to patient engagement, including providing patients the ability to access their medical records. Our results suggest that these patient-focused technical capabilities **may** provide a foundation to support broad implementation of chronic care management processes. While physician practice cultures oriented toward innovation adopted more patient engagement strategies and chronic care management processes, health

care system culture was not associated with practice-level adoption. Cultures oriented to risk-taking might aid local practice stakeholders in overcoming uncertainty when adopting care delivery innovations without the benefit of having evidence-based implementation strategies.

As pressures to improve patient engagement continue to increase, our results suggest that local practice-level capabilities are essential to the implementation of patient-centered health care delivery innovations. Our observation of no significant association between health care system characteristics and patient engagement strategy adoption suggests that health care systems resources might be most impactful if used to nurture practice-level cultural and technical capabilities. We observed that formal training for motivational interviewing and shared decision-making was not widely available. This training gap will be important to fill, as these capabilities are difficult to implement with high fidelity without training and leadership facilitation.^{37,38} Health care system resources might be leveraged to provide training resources and to identify, appraise, and disseminate implementation strategies for constituent practices to deploy locally.

Limitations

Our findings should be considered in light of the study limitations. First, while motivational interviewing, shared decision-making, and shared medical appointments are core patient engagement strategies that aim to activate patients to participate in their treatment decisions, we did not assess important organizational strategies, such as inclusion of patients on advisory councils and quality improvement committees. Second, NSHOS is a single informant survey, but respondents were selected for their knowledge of internal processes and encouraged to consult with others. Third, we were unable to account for sociodemographic characteristics of the patient populations, but included Medicaid revenue to partially account for case-mix. Fourth, we did not have data to address individual physician or patient variability in the adoption of patient engagement strategies. Given high variation in the use of patient engagement strategies, future studies should examine physician-level variation in patient engagement strategies to elucidate how best to disseminate these strategies. Finally, the cross-sectional design does not allow for casual claims to be made. For example, we did not observe ownership changes, so practice capabilities could have pre-dated system ownership. Policies to advance shared decision-making after the passing of the Affordable Care Act³⁹ may have also influenced capabilities and we could not consider these factors. Future research should examine how physician practices modify their capabilities as a result of health care system acquisition.

Conclusion

In conclusion, physician practices with cultures oriented to innovation and strong technical capabilities adopted more patient engagement strategies and chronic care management processes than practices with more limited capabilities. Health care systems with processes in place to assess clinical evidence and with more advanced HIT functions had greater practice-level adoption of chronic care management processes compared to practices with more limited capabilities. In contrast, there was no association between these capabilities

and patient engagement strategies. Practice-level adoption of patient engagement strategies may be less influenced by health care systems because implementation strategies to scale and sustain shared decision-making, motivational interviewing, and shared medical appointments are less established.³⁶ Health care systems should invest in processes to identify, test, and disseminate new evidence across their physician practices and leverage these processes to support the adoption of evidence-based and patient-centered care delivery innovations.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding:

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.

References

1. Richards MR, Nikpay SS, Graves JA. The Growing Integration of Physician Practices. *Med Care*. 2016;54(7):714–718. [PubMed: 27111749]
2. Budetti PP, Shortell SM, Waters TM, et al. Physician and health system integration. *Health Aff (Millwood)*. 2002;21(1):203–210. [PubMed: 11900078]
3. Baker LC, Bundorf MK, Kessler DP. Vertical Integration: Hospital Ownership Of Physician Practices Is Associated With Higher Prices And Spending. *Health Aff (Millwood)*. 2014;33(5):756–763. doi:10.1377/hlthaff.2013.1279 [PubMed: 24799571]
4. Machta RM, Maurer KA, Jones DJ, Furukawa MF, Rich EC. A systematic review of vertical integration and quality of care, efficiency, and patient-centered outcomes. *Health Care Manage Rev*. 2019;44(2):159–173. [PubMed: 29613860]
5. Lammers E The effect of hospital-physician integration on health information technology adoption. *Health Econ*. 2013;22(10):1215–1229. doi:10.1002/hec.2878 [PubMed: 23055450]
6. Prevention C for DC and. Multiple cause of death 1999–2017 on CDC WONDER online Database, released December, 2018. Data are from the Multiple cause of death Files, 1999–2017 as compiled from data provided by the 57 vital statistics jurisdictions through the vital Statistics cooperative Program. *Natl Cent Health Stat*. 2018.
7. Coleman K, Austin BT, Brach C, Wagner EH. Evidence on the chronic care model in the new millennium. *Health Aff (Millwood)*. 2009;28(1):75–85. [PubMed: 19124857]
8. Stollefson M, Dipnarine K, Stopka C. The chronic care model and diabetes management in US primary care settings: a systematic review. *Prev Chronic Dis*. 2013;10:E26–E26. doi:10.5888/pcd10.120180 [PubMed: 23428085]
9. Carman KL, Dardess P, Maurer M, et al. Patient and family engagement: a framework for understanding the elements and developing interventions and policies. *Health Aff (Millwood)*. 2013;32(2):223–231. [PubMed: 23381514]
10. Hibbard JH, Greene J. What the evidence shows about patient activation: better health outcomes and care experiences; fewer data on costs. *Health Aff (Millwood)*. 2013;32(2):207–214. [PubMed: 23381511]

11. Laurance J, Henderson S, Howitt PJ, et al. Patient engagement: four case studies that highlight the potential for improved health outcomes and reduced costs. *Health Aff (Millwood)*. 2014;33(9):1627–1634. [PubMed: 25201668]
12. Miller WR, Rollnick S. *Motivational Interviewing: Helping People Change*. Guilford press; 2012.
13. Sepucha KR, Simmons LH, Barry MJ, Edgman-Levitan S, Licurse AM, Chaguturu SK. Ten Years, Forty Decision Aids, And Thousands Of Patient Uses: Shared Decision Making At Massachusetts General Hospital. *Health Aff (Millwood)*. 2016;35(4):630–636. doi:10.1377/hlthaff.2015.1376 [PubMed: 27044963]
14. Wiley JA, Rittenhouse DR, Shortell SM, 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. [PubMed: 25561647]
15. Sharma AE, Knox M, Peterson LE, Willard-Grace R, Grumbach K, Potter MB. How is family medicine engaging patients at the practice-level?: a national sample of family physicians. *J Am Board Fam Med*. 2018;31(5):733–742. [PubMed: 30201669]
16. Bodenheimer T, Wang MC, Rundall TG, et al. What are the facilitators and barriers in physician organizations' use of care management processes? *Jt Comm J Qual Saf*. 2004;30(9):505–514. [PubMed: 15469128]
17. Shortell SM, Alexander JA, Budetti PP, et al. Physician-system alignment: introductory overview. *Med Care*. 2001;11–18. [PubMed: 11488262]
18. Rogers EM. *Diffusion of Innovations*. Simon and Schuster; 2010.
19. Campbell RJ. Change management in health care. *Health Care Manag*. 2008;27(1):23–39.
20. Casalino L, Gillies RR, Shortell SM, et al. External incentives, information technology, and organized processes to improve health care quality for patients with chronic diseases. *Jama*. 2003;289(4):434–441. [PubMed: 12533122]
21. Li R, Simon J, Bodenheimer T, et al. Organizational factors affecting the adoption of diabetes care management processes in physician organizations. *Diabetes Care*. 2004;27(10):2312–2316. [PubMed: 15451893]
22. Rodriguez HP, McClellan SR, Bibi S, Casalino LP, Ramsay PP, Shortell SM. Increased use of care management processes and expanded health information technology functions by practice ownership and Medicaid revenue. *Med Care Res Rev*. 2016;73(3):308–328. [PubMed: 26577227]
23. Powell BJ, Beidas RS, Lewis CC, et al. Methods to Improve the Selection and Tailoring of Implementation Strategies. *J Behav Health Serv Res*. 2017;44(2):177–194. doi:10.1007/s11414-015-9475-6 [PubMed: 26289563]
24. Quinn MT, Gunter KE, Nocon RS, et al. Undergoing Transformation to the Patient Centered Medical Home in Safety Net Health Centers: Perspectives from the Front Lines. *Ethn Dis*. 2013;23(3):356–362. [PubMed: 23914423]
25. Schmittiel JA, Shortell SM, Rundall TG, Bodenheimer T, Selby JV. Effect of Primary Health Care Orientation on Chronic Care Management. *Ann Fam Med*. 2006;4(2):117–123. doi:10.1370/afm.520 [PubMed: 16569714]
26. Hsu C, Liss DT, Westbrook EO, Arterburn D. Incorporating Patient Decision Aids into Standard Clinical Practice in an Integrated Delivery System. *Med Decis Making*. 2013;33(1):85–97. doi:10.1177/0272989X12468615 [PubMed: 23300204]
27. Hurley VB, Rodriguez HP, Kearing S, Wang Y, Leung MD, Shortell SM. The Impact Of Decision Aids On Adults Considering Hip Or Knee Surgery. *Health Aff (Millwood)*. 2020;39(1):100–107. doi:10.1377/hlthaff.2019.00100 [PubMed: 31905066]
28. Kirsh SR, Lawrence RH, Aron DC. Tailoring an intervention to the context and system redesign related to the intervention: A case study of implementing shared medical appointments for diabetes. *Implement Sci*. 2008;3(1):34. [PubMed: 18533021]
29. Friedberg MW, Safran DG, Coltin KL, Dresser M, Schneider EC. Readiness for the Patient-Centered Medical Home: structural capabilities of Massachusetts primary care practices. *J Gen Intern Med*. 2009;24(2):162–169. [PubMed: 19050977]
30. Frehn JL, Brewster AL, Shortell SM, Rodriguez HP. Comparing health care system and physician practice influences on social risk screening. *Health Care Manage Rev*. September 2021. doi:10.1097/HMR.0000000000000309

31. Brewster AL, Frazee TK, Gottlieb LM, Frehn J, Murray GF, Lewis VA. The Role of Value-Based Payment in Promoting Innovation to Address Social Risks: A Cross-Sectional Study of Social Risk Screening by US Physicians. *Milbank Q.* 2020;98(4):1114–1133. doi:10.1111/1468-0009.12480 [PubMed: 33078875]
32. Ivey SL, Shortell SM, Rodriguez HP, Wang Y (Emily). Patient Engagement in ACO Practices and Patient-reported Outcomes Among Adults With Co-occurring Chronic Disease and Mental Health Conditions. *Med Care.* 2018;56(7):551–556. doi:10.1097/MLR.0000000000000927 [PubMed: 29762273]
33. Hinkle DE, Wiersma W, Jurs SG. *Applied Statistics for the Behavioral Sciences.* Rand McNally College Pub. Co.; 1979.
34. Quinn RE, Rohrbaugh J. A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organizational Analysis. *Manag Sci.* 1983;29(3):363–377.
35. Norton PT, Rodriguez HP, Shortell SM, Lewis VA. Organizational Influences on Health Care System Adoption and Use of Advanced Health Information Technology Capabilities. *Am J Manag Care.* 2019;25(1):e21–e25. [PubMed: 30667614]
36. Weiner BJ. A theory of organizational readiness for change. *Implement Sci.* 2009;4(1):67. [PubMed: 19840381]
37. Légaré F, Ratté S, Gravel K, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: update of a systematic review of health professionals' perceptions. *Patient Educ Couns.* 2008;73(3):526–535. [PubMed: 18752915]
38. Schumacher JA, Madson MB, Nilsen P. Barriers to learning motivational interviewing: A survey of motivational interviewing trainers' perceptions. *J Addict Offender Couns.* 2014;35(2):81–96.
39. Durand MA, Barr PJ, Walsh T, Elwyn G. Incentivizing shared decision making in the USA – where are we now? *Healthcare.* 2015;3(2):97–101. doi:10.1016/j.hjdsi.2014.10.008 [PubMed: 26179730]

Takeaway Points:

This national study examines health system and physician practice capabilities associated with adoption of patient engagement strategies and chronic care management processes.

- Health systems with processes to assess clinical evidence and with more advanced health information technology (IT) functions were associated with greater adoption of chronic care management processes in constituent physician practices, but not patient engagement strategies.
- Physician practices with processes to assess clinical evidence, cultures oriented to innovation, and more advanced health IT functionality, adopted more patient engagement strategies and chronic care management processes.
- Practice-level capabilities are essential for implementing disruptive innovations like patient engagement strategies.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

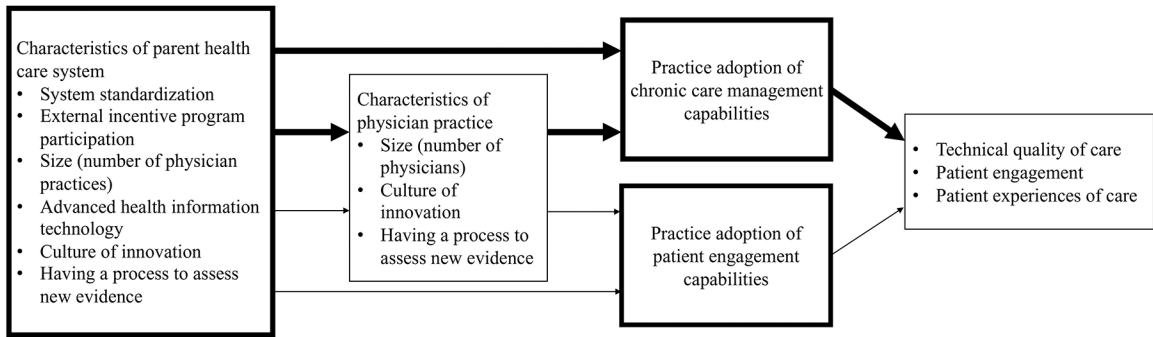


Figure 1:
Logic Model of Health Care System Influences on Practice Adoption of Patient Engagement and Chronic Care Management Capabilities

Arrows represent the predicted direction and magnitude of influences on the adoption of chronic care management processes and patient engagement strategies for patients with diabetes and/or cardiovascular disease in health care system-owned physician practices. Thick lines represent a relatively larger predicted influence compared to thin lines.

Table 1:

Descriptive Statistics for Health Care Systems and System-Owned Physician Practices (2017/2018)

		Total
		Mean (Standard Deviation) Frequency (Percentage)
<u>Parent Health Care System Characteristics</u>		
		<u>N=247</u>
Process to Assess New Evidence		139 (56.3%)
Culture of Innovation		25.1 (15.2)
Advanced Health Information Technology		53.7 (23.7)
Participation in Delivery Reform		144 (58.3%)
Participation in Payment Reform		0.9 (1.1)
Health Care System Standardization		73.6 (19.8)
Size (Number of Physician Practices)	1–22 Practices	112 (45.3%)
	22–68 Practices	73 (29.6%)
	69–165 Practices	46 (18.6%)
	166+ Practices	16 (6.5%)
For-Profit Status		62 (25.1%)
System Ownership of a Health Plan		72 (29.1%)
<u>System-Owned Physician Practice Characteristics</u>		
		<u>N=796</u>
Process to Assess New Evidence		395 (49.6%)
Culture of Innovation		52.6 (20.7)
Advanced Health Information Technology Index		3.1 (1.2)
Size (Number of Physicians)	1–9 Physicians	555 (69.7%)
	10–20 Physicians	141 (17.7%)
	21+ Physicians	100 (12.6%)
Primary Care Physicians (% of Total Physicians)	<33%	57 (7.2%)
	33–99%	611 (76.8%)
	100%	128 (16.1%)
Medicaid Revenue (% of Total Revenue)	None	68 (8.5%)
	Low (1–29%)	540 (67.8%)
	High (30%+)	188 (23.6%)
U.S. Census Region	West	209 (26.3%)
	South	295 (37.1%)
	Northeast	118 (14.8%)
	Midwest	174 (21.9%)

Data are presented as mean (standard deviation) for continuous measures, and n (%) for categorical measures. Source: National Survey of Healthcare Organizations and Systems (NSHOS).

Table 2:

Adoption of Chronic Care Management and Patient Engagement Capabilities for Diabetes and Cardiovascular Disease in System-owned Physician Practices (2017/18)

	Total N=796
	Mean (Standard Deviation) Frequency (Percentage)
<u>Chronic Care Management Capabilities Composite</u>	69.7 (29.9)
Written Guidelines: Diabetes	574 (72.1%)
Written Guidelines: Hypertension	523 (65.7%)
Electronic Health Record Decision Support: Diabetes	549 (69.0%)
Electronic Health Record Decision Support: Hypertension	467 (58.7%)
Registry: Diabetes	586 (73.6%)
Registry: Hypertension	461 (57.9%)
Collect Physician Performance: Diabetes	683 (85.8%)
Collect Physician Performance: Hypertension	598 (75.1%)
<u>Patient Engagement Capabilities Composite</u>	41.4 (28.5)
Shared Medical Appointment: Cardiovascular Disease	34 (4.3%)
Shared Medical Appointment: Diabetes	92 (11.6%)
Motivational Interviewing: Smoking Cessation	475 (59.7%)
Motivational Interviewing: Weight Loss/Diet	477 (59.9%)
Motivational Interviewing: Increase in Physical Activity	460 (57.8%)
Motivational Interviewing: Medication Adherence	448 (56.3%)
Motivational Interviewing Training (Staff or Clinicians)	397 (49.9%)
Decision Aid: Selecting Medication for Diabetes	221 (27.8%)
Physician/Staff Routinely Use Decision Aids	256 (32.2%)
Physician/Staff Formally Trained in Shared Decision Making	304 (38.2%)
Physician/Staff Routinely Engage in Shared Decision Making	432 (54.3%)
Physician/Staff Follow-up After Shared Decision Making	354 (44.5%)

Composite scale values are presented as mean (standard deviation). Individual items are presented as the frequency (percentage) of sampled physician practices that report adopting that strategy. Source: National Survey of Healthcare Organizations and Systems (NSHOS).

Table 3:

Health Care System and Physician Practice Characteristics Associated with Patient Engagement and Chronic Care Management Capabilities for Adults with Diabetes and/or Cardiovascular Disease (2017/2018)

	Patient Engagement Capabilities		Chronic Care Management Capabilities	
	Coefficient (Robust Standard Error)			
<u>Health Care System Characteristics</u>				
Process to Assess New Evidence		1.36 (2.45)		6.79 ** (2.35)
Culture of Innovation		-1.05 (1.12)		-1.18 (1.36)
Advanced Health Information Technology		0.30 (1.15)		2.85 * (1.30)
Participation in Delivery Reform		-1.67 (2.48)		-0.26 (2.56)
Participation in Payment Reform		0.83 (1.21)		-1.32 (1.21)
Health Care System Standardization		-0.65 (1.19)		1.54 (1.42)
Size (Number of Physician Practices)	1–22	Ref.		Ref.
	22–68		-3.51 (2.80)	4.16 (3.15)
	69–165		-3.57 (3.24)	-0.39 (2.96)
	166+		-0.54 (3.82)	1.65 (3.95)
<u>Physician Practice Characteristics</u>				
Process to Assess New Evidence		4.44 * (1.97)		7.37 *** (1.88)
Culture of Innovation		10.73 *** (0.89)		9.70 *** (0.97)
Advanced Health Information Technology		3.18 *** (0.87)		5.59 *** (1.08)
Size (Number of Physicians)	1–9	Ref.		Ref.
	10–20		-2.11 (2.39)	0.40 (2.67)
	21+		-4.55 (2.80)	-3.09 (2.90)
Proportion Primary Care Physicians	<33%	Ref.		Ref.
	33–99%		-0.74 (3.25)	-5.61 (3.88)
	100%		6.14 (4.09)	-4.05 (4.58)
Medicaid Percentage	None	Ref.		Ref.
	Low (1–29%)		1.00 (3.55)	6.09 (3.90)
	High (30%+)		1.85 (4.02)	5.23 (4.22)
Census Region	West	Ref.		Ref.
	South		-3.96 (3.05)	-1.93 (2.96)
	Northeast		-5.68 (3.99)	-8.41 (4.52)
	Midwest		-4.67 (3.52)	-6.97 * (3.35)
Constant		44.36 *** (6.05)		63.78 *** (6.19)
sd(Health System)		8.58 *** (2.02)		8.77 *** (2.19)
sd(Constant)		23.83 *** (0.74)		24.25 *** (0.91)

P < 0.001;

**
P < 0.01;

*
P < 0.05.

Source: National Survey of Healthcare Organizations and Systems (NSHOS). Sample consists of 796 physician practices nested within 247 parent health care systems.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript