Title

Housing, Transportation, And Food: How ACOs Seek To Improve Population Health By Addressing Nonmedical Needs Of Patients

Journal

Health Affairs, 35(11)

ISSN

0278-2715

Authors

Fraze, Taressa
Lewis, Valerie A
Rodriguez, Hector P
et al.

Publication Date

2016-11-01

DOI

10.1377/hlthaff.2016.0727

Peer reviewed

HHS Public Access

Author manuscript

Health Aff (Millwood). Author manuscript; available in PMC 2017 November 01.

Published in final edited form as:

Health Aff (Millwood). 2016 November 01; 35(11): 2109–2115. doi:10.1377/hlthaff.2016.0727.

Housing, Transportation, And Food: How ACOs Seek To Improve Population Health By Addressing Nonmedical Needs Of Patients

Taressa Fraze, Ph.D.,
The Dartmouth Institute for Health Policy and Clinical Practice, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

Valerie A. Lewis, Ph.D.,
The Dartmouth Institute for Health Policy and Clinical Practice, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

Hector P. Rodriguez, Ph.D., M.P.H., and
Center for Healthcare Organizational and Innovation Research, University of California, Berkeley, Berkeley, California; Division of Health Policy and Management, UC Berkeley School of Public Health, Berkeley, California

Elliott S. Fisher, M.D, M.P.H.
The Dartmouth Institute for Health Policy and Clinical Practice, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

Abstract

Addressing non-medical needs is critical to advance population health, improve quality of care, and lower the costs of care. Accountable care organizations (ACOs) may be more likely to address these needs. We used qualitative interviews to examine how ACOs address non-medical patient needs. We developed a typology of medical and social services among ACOs that disentangles services and organizational integration. ACOs commonly addressed housing, transportation, and food insecurity needs. ACOs identified needs through processes as part of the primary care visit or existing care management programs. ACO approaches to meeting patients' non-medical needs were characterized as either individualized solutions, developed on a patient-by-patient basis; or targeted approaches, programs developed to address specific needs. As policymakers continue to invest in programs to spur organizations to meet a broader spectrum of patients' needs, these findings offer insights on how health care organizations integrate with non-medical organizations.

There is growing consensus that adequately addressing patients' non-medical needs is a critical element to advance population health, improve quality and lower costs of medical care.(1–8) Estimates suggest that 40–90% of health outcomes are attributable to social, behavioral, and economic factors(5,9,10), these non-medical factors may also significantly affect health care utilization and outcomes.(11–15) For example, research has shown people with housing instability have increased rates of emergency department visits and inpatient hospitalizations.(16) Targeted studies demonstrate the benefits of addressing non-medical needs on health care outcomes.(11,17–22) For example, among chronically homeless adults with severe alcohol problems, a randomized trial showed that stable housing reduced medical costs by 53%(23). A broad array of policy initiatives may increase the capacity of

providers to address patients' non-medical needs. Health policy initiatives, such as accountable care organizations (ACOs), bundled payments, and managed care, have focused on creating financial incentives for providers to improve outcomes and lower costs; while these policy initiatives do not explicitly address patients' non-medical needs, some posit the initiatives may spur providers to more broadly address patient needs.(1–4,24,25)

Despite broad agreement on the importance of addressing patients' non-medical needs, little is known about if and how health care organizations operating under new payment models have approached patients' non-medical needs. Research on how providers address the non-medical needs of patients has traditionally centered on specific interventions within a narrow range of settings such as clinics serving homeless individuals.(11–13,15,26,27) While valuable, this research provides little understanding of the broader approaches health care organizations use to address non-medical needs including the range of services directly provided, populations targeted, strategies for coordinated services, and organizational and financial models to integrate health care and social services. In an effort to spur innovation and test new models in this realm, the Centers for Medicare and Medicaid Services recently announced accountable health communities, a $157 million initiative to implement and evaluate three approaches to addressing patients' non-medical needs.

Early evidence on the approaches providers under payment and delivery reform are using to meet non-medical needs is needed to inform policy in this realm. To provide early insight in this area, we conducted qualitative interviews with ACOs to (1) describe which non-medical needs ACOs were trying to address; and (2) describe their approaches to address those needs. We defined ACOs as voluntary groups of providers who are contractually and collectively responsible for total cost and quality of care for a defined patient population.(28–30) Given the significant impact of non-medical factors on health costs and patient outcomes, ACOs may address underlying non-medical factors to control costs and improve quality.(4,31) Further, ACO proponents hope the model will afford providers the flexibility and incentives necessary to address patient needs, including non-medical needs, through better coordination and integration of care.(1,32–35) To date, no research has examined if value-based payment models have spurred providers to address patients' non-medical needs.

METHODS

We conducted qualitative research with ACOs to understand clinical transformation activities. We included two sets of data: a total of 58 semi-structured phone interviews with leaders at 32 ACOs; and in-depth site visits at three ACOs. We defined ACOs as voluntary groups of providers who were contractually and collectively responsible for total cost and quality of care for a defined patient population.(36)

We conducted 58 semi-structured phone interviews over the course of two years; a first set between June and December 2013, and a second set between July and August 2014. Of the 32 interviewed ACOs, 14 were interviewed in both time periods. The 32 ACOs were selected from an ACO database maintained by our team.(36) ACOs were selected to ensure diversity on geography, composition, safety net participation, leadership, clinical transformation, and payer. We targeted ACO and clinic leadership as respondents. Interviews

typically lasted an hour and covered topics including ACO structure, ACO formation, leadership structure, motivations, care delivery, initiatives and capabilities, provider engagement, implementation challenges and strategies, and future plans. We specifically asked about ACOs' strategies focused on socially disadvantaged patients and non-medical needs.

Following the 2014 phone interviews, we selected three ACOs for further in-depth study. ACOs were selected based on advanced clinical transformation and diversity in composition, structure, patients served, and geography. Three team members visited each site for three days. We interviewed a range of respondents at each site including participating providers, key committee or board members, ACO leadership, clinical leadership, and care coordination team members. We typically conducted at least 25 interviews per site and observed management, quality, or clinical meetings.

Interviews were recorded and professionally transcribed. All interviews and summaries were analyzed using QRS NVivo. We defined non-medical needs as any patient need that was not clinical in nature, but had the potential to impact health. We did not include behavioral health as a non-medical need; however, many patients with behavioral health diagnoses may also have non-medical needs (e.g., these patients may have transportation needs which would have been included in analyses). Our analytic approach was collaborative and highly iterative across team members. First, three transcripts were coded for ACO's non-medical services by two team members. Once coding consistency was met, a single team member coded the remaining transcripts. We developed a memo based on initial coding that summarized proposed findings across ACOs and detailed all non-medical activities within each ACO.(37) Data were then coded again for proposed themes and findings were updated.

Study limitations

Our study has limitations. First, as a qualitative study, our results are not meant to be generalized to all ACOs; rather these findings provide insights into how some ACOs are addressing patients' non-medical needs. Second, data are from 2013–2015 which may not fully represent how ACOs are currently addressing non-medical needs. Considering how little research there is on how providers address patients' non-medical needs, qualitative research offers a formative understanding of how providers and organizations were addressing non-medical needs.

Third, data are primarily from the perspective of ACO leaders with less information from partner organizations, providers, or staff implementing programs. Interviews with ACO leaders gave us a broad understanding of a range of ACO activities.(32,38) Fourth, since our study describes the approaches and methods ACOs were actively using to address non-medical needs, we do not have data on the effectiveness of these approaches. ACOs reported they believed addressing non-medical needs would yield cost savings for the ACO and would improve patient health; however, ACOs were unable to offer concrete data on the effectiveness of their efforts.

RESULTS

We identified 16 ACOs addressing patients' non-medical needs. We first present a typology of non-medical and medical care integration in ACOs (exhibit 1) We then present data on the non-medical needs ACOs addressed, and the methods and approaches ACOs used to meet patients' non-medical needs.

Typology for organizational and services integration

Based on these analyses, we developed a typology that categorizes four approaches used to integrate patients' non-medical needs with medical care (exhibit 1). We distinguished two types of integration: (1) organizational integration, such as governance, across distinct medical and non-medical services; and (2) service delivery integration, such as shared or coordinated programs, that provided patient services across provider types. ACOs that were addressing patients' non-medical needs displayed varying levels of partnership and integration with other distinct types of organizations such as public health, community, social service, and government. Service delivery integration was defined as programs or processes with varying degrees of integration across organizations designed to meet patients' non-medical needs.

Most ACOs, including those not addressing non-medical needs, fell into the *non-coordinated category* where neither services nor organizations were significantly integrated. One ACO was in the *segmented category* because the county owned and operated both health care and county social service organizations, but services remained distinct and were not integrated.

Among ACOs actively addressing non-medical needs, most were within or moving toward a *referral category,* where non-medical and medical services were coordinated in some way, but organizations remained fully independent and distinct. For example, one ACO created a formal process where medical providers referred patients to partner organizations when non-medical needs were identified. Another ACO negotiated streamlined processes for patients to receive housing support from local agencies. Two organizations were moving toward the *fully integrated category* where services and organizations were integrated across medical and non-medical care in meaningful ways. In both cases, organizational integration did not involve organizations actually merging, but instead involved non-medical providers or agencies joining medical providers as voting members on the ACO board. In both cases, ACO formation served as a catalyst for the integration between medical and community.

Non-medical needs ACOs addressed

ACOs addressed a variety of non-medical needs with transportation, housing, and food insecurity the most common. ACOs believed these needs were common in their patient population, that these needs affected how patients engaged in medical care, and that ACOs had the potential to impact these needs.

Transportation needs—Transportation was viewed by many ACOs as a barrier for patients to receive timely, quality care. Approaches were varied, some ACOs collaborated with transportation companies, some utilized public transportation, and others designed new programs. How an ACO met transportation needs varied based on the geographic

characteristics and the area transit infrastructure. ACOs in areas with quality public transit typically relied on existing infrastructure. For example, ACOs sometimes provided transportation passes to patients in advance of appointments. One ACO provided monthly bus passes, which could be used for any transportation need, to all patients with four or more medical visits per month.

ACOs in suburban or rural areas experienced challenges meeting transportation needs because of poor infrastructure. One ACO invested heavily in a local community agency that provided medical transportation so the agency could expand services. Another rural ACO provided transportation services through an external, for-profit company. The transportation company was given a per-member-per-month rate that allowed for comprehensive services such as 24-hour service telephone line to arrange immediate transportation for unscheduled, emergent medical services. Finally, one ACO in an urban area with poor public transportation was considering a mobile device application that would allow patients to request transportation from local drivers.

Housing needs—ACOs reported that basic needs, such as stable housing, needed to be addressed before patients could effectively engage in medical care. ACOs most commonly developed relationships and partnerships with external housing agencies, sometimes community partners and oftentimes with public health agencies to provide emergency, short, and long-term support. ACOs served as an administrative resource by: (1) identifying housing options, (2) coordinating with housing agencies, (3) negotiating with housing resources, and (4) completing paperwork for the patient. These activities reduced patient burden for accessing housing services so they could more easily obtain support.

Some ACOs negotiated innovative solutions to address patient housing needs. For example, one ACO negotiated with a housing program to alter the substance use requirements so that ACO patients could first receive housing and then begin addiction treatment to maintain housing benefits. Another ACO reported high emergency department costs because patients were not discharged appropriately and negotiated designated beds with a housing agency which streamlined the discharge process.

Food insecurity—ACOs commonly reported nutrition and food insecurity were important issues for their patient populations. Some ACOs offered assistance for patients to access public programs, such as the supplemental nutrition assistance program, by determining patients' eligibility and aiding in the enrollment process. Many ACOs partnered with local food banks since these organizations were already a common patient resource.

Two ACOs used unique approaches to meet food insecurity needs. One ACO partnered with a food bank and farmers to offer subsidized seasonal produce to patients. The ACO purchased local produce from farmers, with support from the food bank, and then offered "market" days in the parking lot of their community health center for patients at reduced prices. A second ACO used a food bank to prepare healthy meals for patients with a qualifying illness. The ACO observed many patients obtained food from one community partner whose donated food was often processed and unhealthy. The ACO provided financial resources for the food bank to prepare daily, fresh meals for patients.

Methods ACOs used to address non-medical patient needs

Identifying patients with non-medical needs—ACOs reported two common methods of identifying patients with non-medical needs: (1) patient screening processes; and (2) broader, existing clinical or care delivery efforts (exhibit 2). ACOs that used patient screening processes reported these were usually done at primary care visits either directly by a provider or with a health assessment. Patients identified with non-medical needs were subsequently referred into appropriate programs with specific staff available to help address those needs.

ACOs also identified patients' with non-medical needs through existing care management or clinical improvement program aimed at improving quality or reducing costs of care. Several ACOs identified patients with non-medical needs by analyzing hospital utilization patterns. For example, some ACOs employed additional staff within the emergency department to discuss medical and non-medical needs and connect patients to appropriate resources. Other ACOs targeted conditions, such as chronic conditions, through quality improvement programs and identified non-medical needs during these improvement processes.

Allocating ACO resources to meet non-medical needs—ACOs reported using both internal and external resources for programs focused on non-medical needs (exhibit 2). Internal resources were used by relying on existing team-based care management programs with specific care teams assigned to assist with non-medical needs. Other ACOs designated staff members, such as social workers or care managers, to be consistently responsible for meeting specific non-medical needs.

ACOs utilized external resources, such as community partners, public health agencies, and purchased services, to meet non-medical needs. One ACO utilized local churches, even when patients were not members of the church, to meet non-medical needs. Another ACO partnered with public health agencies to streamline application and enrollment processes for program participation. ACOs commonly partnered with community agencies, such as food banks, fitness centers, nonprofits for substance abuse and housing needs, and community centers, to support patient needs. These agencies offered services, staffing, and financial support to meet ACO patients' non-medical needs. A few ACOs purchased external services, such as contractual arrangements with companies, to provide transportation services or other common unmet needs.

Approaches to meeting non-medical needs—ACOs developed both individualized and targeted approaches for meeting non-medical needs (exhibit 2). Individualized approaches –solutions developed on a patient-by-patient basis – were sometimes well-defined (e.g., via processes through care teams) and sometimes ad-hoc (e.g., as needs were observed). For example, as part of one ACO's care pathway patients were given individualized assessments to identify medical and nonmedical needs. Needs, such as transportation and housing support, were identified during standard processes and then a plan was developed. ACOs with less well-defined approaches would observe a patient need via care management or during a clinical visit and attempt to find an appropriate resource (e.g., provide a single bus token when needed or locate housing resources as needed).

In contrast, targeted approaches were well-defined, formalized solutions designed to meet a specific need (e.g., transportation) for a population, rather than an individual. For example, programs to provide transportation, solutions for housing such as a specified number of beds for ACO patients, and availability of nutrition programs were targeted approaches. ACOs often used a mix of individualized and targeted approaches depending on the volume patients' need and organizational resources.

DISCUSSION

Population health management through integrated medical and non-medical services has garnered significant attention in the last few years(1,26,39–41); yet, there is little understanding of how to actually implement integrated services to improve population health. Reform initiatives, especially ACOs, hold the potential of expanding the base of responsibility from a reactive approach to a proactive approach which.(4,42) This paper offers early insights into how some ACOs assumed responsibility for patients by addressing non-medical needs.

We found ACOs most often addressed needs related to housing, transportation, and food insecurity. While there were a variety of specific approaches to meet needs, most were characterized as either individualized solutions developed on a patient-by-patient basis or targeted approaches with formalized solutions to a given need. Based on these findings, we developed a typology of medical and non-medical services integration in ACOs that classifies ACOs by organizational and service delivery integration. At the time of this study, we found a few advanced ACOs were moving towards the fully integrated category where both organizational activities and services were highly integrated. Based on these findings, more advanced ACOs had aspects of both organizational and service delivery integration. These ACOs believed that by partnering with other types of providers and services, such as public health, community health resources, and social service agencies, they provided better patient care.

Our research offers several implications. We found ACOs struggled with program scalability. ACOs described instances where a more general need was observed, but they were only able to provide solutions on an individualized basis. ACOs may experience several barriers to developing formalized programs to meet patient needs such as a financial resources, staffing capacity, and competing clinical priorities. ACOs reported their patients had substantial needs and that despite recognizing the importance of trying to meet those needs, ACOs did not think they had the capacity, expertise, or resources to fully address patients' non-medical needs. Even ACOs with formalized programs to meet non-medical needs, such as the transportation brokerage program described, experienced significant implementation barriers. Programs were often developed for one segment of the patient population – such as nutrition assistance for those with specific conditions – yet, many other population segments would also benefit. Similarly, it is only those who are engaged in the medical system who have the opportunity to be involved in those programs. For example, a patient must first be diagnosed with diabetes, then be referred into the nutrition program for people with this condition. Thus, an ACO's ability to comprehensively address any given need across a population (non-medical or medical) is limited.

Our study also offers insights and implications for policy initiatives such as accountable health communities.(24) Organizations participating in other policy initiatives may experience similar challenges around screening capabilities, scalability of programs, and comprehensively addressing needs. Future research should examine the effects of programs on community and patient outcomes related to both medical and social service utilization. The effects may be nuanced and heterogeneous; for example, participation in social services may increase while emergency department visits may decrease. It will be important to tease out varied effects to determine which activities can be most effective at addressing patient needs while reducing costs and improving quality of care.

References

1. Fisher ES, Corrigan J. Accountable Health Communities: Getting There from Here. JAMA. 2014 Nov 26; 312(20):2093–4. [PubMed: 25423215]
2. Hacker K, Walker DK. Achieving Population Health in Accountable Care Organizations. Am J Public Health. 2013 May 16; 103(7):1163–7. [PubMed: 23678910]
3. Noble DJ, Casalino LP. Can Accountable Care Organizations Improve Population Health?: Should They Try? JAMA. 2013 Mar 20; 309(11):1119–20. [PubMed: 23512057]
4. Shortell SM. Bridging the Divide Between Health and Health Care. JAMA. 2013 Mar 20; 309(11): 1121–2. [PubMed: 23512058]
5. McGinnis JM, Williams-Russo P, Knickman JR. The Case For More Active Policy Attention To Health Promotion. Health Aff (Millwood). 2002 Mar 1; 21(2):78–93.
6. Eggleston EM, Finkelstein JA. Finding the Role of Health Care in Population Health. JAMA. 2014 Feb 26; 311(8):797–8. [PubMed: 24457610]
7. Lavizzo-Mourey R. Halfway there?. Health Reform Starts Now. JAMA. 2016 Apr 5; 315(13):1335–6. [PubMed: 26940727]
8. The Robert Wood Johnson Foundation. Health Care's Blind Side: The Overlooked Connection Between Social Needs and Good Health [Internet]. 2011 Dec. Available from: http://www.rwjf.org/en/library/research/2011/12/health-care-s-blind-side.html
9. Booske, B., Athens, J., Kindig, D., Park, H., Remington, P. Different Perspectives for Assigning Weights to Determinants of Health. University of Wisconsin Population Health Institute; 2010.
10. McGinnis J, Foege WH. Actual Causes of Death in the United States. JAMA. 1993 Nov 10; 270(18):2207–12. [PubMed: 8411605]
11. Beck AF, Henize AW, Kahn RS, Reiber KL, Young JJ, Klein MD. Forging a Pediatric Primary Care–Community Partnership to Support Food-Insecure Families. Pediatrics. 2014 Aug 1; 134(2):e564–71. [PubMed: 25049345]
12. Kushel MB, Gupta R, Gee L, Haas JS. Housing Instability and Food Insecurity as Barriers to Health Care Among Low-Income Americans. J Gen Intern Med. 2006 Jan; 21(1):71–7. [PubMed: 16423128]
13. Bradley EH, Canavan M, Rogan E, Talbert-Slagle K, Ndumele C, Taylor L, et al. Variation In Health Outcomes: The Role Of Spending On Social Services, Public Health, And Health Care, 2000–09. Health Aff (Millwood). 2016 May 1; 35(5):760–8. [PubMed: 27140980]
14. Acevedo-Garcia D, Osypuk TL, Werbel RE, Meara ER, Cutler DM, Berkman LF. Does Housing Mobility Policy Improve Health? Housing Policy Debate. 2004 Jan 1; 15(1):49–98.
15. Shier G, Ginsburg M, Howell J, Volland P, Golden R. Strong Social Support Services, Such As Transportation And Help For Caregivers, Can Lead To Lower Health Care Use And Costs. Health Aff (Millwood). 2013 Mar 1; 32(3):544–51. [PubMed: 23459734]
16. Kushel MB, Gupta R, Gee L, Haas JS. Housing Instability and Food Insecurity as Barriers to Health Care Among Low-Income Americans. J Gen Intern Med. 2006 Jan; 21(1):71–7. [PubMed: 16423128]

17. Burkhardt MC, Beck AF, Conway PH, Kahn RS, Klein MD. Enhancing Accurate Identification of Food Insecurity Using Quality-Improvement Techniques. Pediatrics. 2012 Feb; 129(2):e504–10. [PubMed: 22250022]
18. Page-Reeves J, Kaufman W, Bleecker M, Norris J, McCalmont K, Ianakieva V, et al. Addressing Social Determinants of Health in a Clinic Setting: The WellRx Pilot in Albuquerque, New Mexico. J Am Board Fam Med. 2016 May 1; 29(3):414–8. [PubMed: 27170801]
19. Bielaszka-DuVernay C. The "GRACE" Model: In-Home Assessments Lead To Better Care For Dual Eligibles. Health Aff (Millwood). 2011 Mar 1; 30(3):431–4. [PubMed: 21383359]
20. Meyer H. A New Care Paradigm Slashes Hospital Use And Nursing Home Stays For The Elderly And The Physically And Mentally Disabled. Health Aff (Millwood). 2011 Mar 1; 30(3):412–5. [PubMed: 21383354]
21. Counsell SR, Callahan CM, Clark DO, et al. Geriatric Care Management for Low-Income Seniors: A Randomized Controlled Trial. JAMA. 2007 Dec 12; 298(22):2623–33. [PubMed: 18073358]
22. Sadowski LS, Kee RA, VanderWeele TJ, Buchanan D. Effect of a Housing and Case Management Program on Emergency Department Visits and Hospitalizations Among Chronically Ill Homeless Adults: A Randomized Trial. JAMA. 2009 May 6; 301(17):1771–8. [PubMed: 19417194]
23. Larimer ME, Malone DK, Garner MD, et al. Health Care And Public Service Use And Costs Before And After Provision Of Housing For Chronically Homeless Persons with Severe Alcohol Problems. JAMA. 2009 Apr 1; 301(13):1349–57. [PubMed: 19336710]
24. Alley DE, Asomugha CN, Conway PH, Sanghavi DM. Accountable Health Communities — Addressing Social Needs Through Medicare and Medicaid. N Engl J Med. 2016 Jan 7; 374(1):8–11. [PubMed: 26731305]
25. Lavizzo-Mourey, R. Halfway there? health reform starts now. JAMA [Internet]. 2016 Mar 3. [cited 2016 Mar 10]; Available from: http://dx.doi.org/10.1001/jama.2016.1732
26. Fisher MP, Elnitsky C. Health and Social Services Integration: A Review of Concepts and Models. Soc Work Public Health. 2012 Jul 23; 27(5):441–68. [PubMed: 22873935]
27. Cook JT, Frank DA, Levenson SM, Neault NB, Heeren TC, Black MM, et al. Child Food Insecurity Increases Risks Posed by Household Food Insecurity to Young Children's Health. J Nutr. 2006 Apr 1; 136(4):1073–6. [PubMed: 16549481]
28. Lewis VA, Colla CH, Schoenherr KE, Shortell SM, Fisher ES. Innovation in the Safety Net: Integrating Community Health Centers Through Accountable Care. J Gen Intern Med. 2014; 29(11):1484–90. [PubMed: 25008217]
29. Colla CH, Lewis VA, Shortell SM, Fisher ES. First National Survey Of ACOs Finds That Physicians Are Playing Strong Leadership And Ownership Roles. Health Aff (Millwood). 2014 Jun 1; 33(6):964–71. [PubMed: 24889945]
30. Colla, CH., Lewis, VA., Kao, L., O'Malley, A., Chang, C., Fisher, ES. Association Between Medicare Accountable Care Organization Implementation And Spending Among Clinically Vulnerable Beneficiaries. JAMA Intern Med [Internet]. 2016 Jun 20. [cited 2016 Jul 29]; Available from: http://dx.doi.org/10.1001/jamainternmed.2016.2827
31. Zusman EE, Carr SJ, Robinson J, Kasirye O, Zell B, Miller WJ, et al. Moving toward implementation: The potential for accountable care organizations and private–public partnerships to advance active neighborhood design. Prev Med. 2014 Dec; 69(Supplement):S98–101. [PubMed: 25117525]
32. Lewis VA, Colla CH, Tierney K, Citters ADV, Fisher ES, Meara E. Few ACOs Pursue Innovative Models That Integrate Care For Mental Illness And Substance Abuse With Primary Care. Health Aff (Millwood). 2014 Oct 1; 33(10):1808–16. [PubMed: 25288427]
33. Lewis VA, Larson BK, McClurg AB, Boswell RG, Fisher ES. The Promise And Peril Of Accountable Care For Vulnerable Populations: A Framework For Overcoming Obstacles. Health Aff (Millwood). 2012 Aug 1; 31(8):1777–85. [PubMed: 22869656]
34. Shortell SM, Colla CH, Lewis VA, Fisher E, Kessell E, Ramsay P. Accountable Care Organizations: The National Landscape. J Health Polit Policy Law. 2015 Aug 1; 40(4):647–68. [PubMed: 26124295]

35. Shortell SM, Sehgal NJ, Bibi S, Ramsay PP, Neuhauser L, Colla CH, et al. An Early Assessment of Accountable Care Organizations' Efforts to Engage Patients and Their Families. Med Care Res Rev. 2015 Jun.2:1077558715588874.

36. Editor, please insert appendix verbiage.

37. Miles, MBM., Huberman, AM. Qualitative data analysis: An expanded sourcebook. 3. Sage; 2014.

38. Lewis VA, Colla CC, Schoenherr KE, Shortell SM, Fisher ES. Innovation in the Safety Net: Community Health Centers in Accountable Care Organizations. J Gen Intern Med. 2014

39. Auerbach J. Creating Incentives to Move Upstream: Developing a Diversified Portfolio of Population Health Measures Within Payment and Health Care Reform. Am J Public Health. 2015 Jan 20; 105(3):427–31. [PubMed: 25602896]

40. Mays GP, Scutchfield FD. Improving Public Health System Performance Through Multiorganizational Partnerships. Prev Chronic Dis [Internet]. 2010 Oct 15.7(6) [cited 2016 Mar 7]. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2995603/.

41. Mays GP, Scutchfield FD. Improving Population Health by Learning From Systems and Services. Am J Public Health. 2015 Feb 17; 105(S2):S145–7. [PubMed: 25689191]

42. 3.0: A New Operating System for Public Health [Internet]. UCLA Public Health Magazine; 2012. Available from: http://ph.ucla.edu/news/magazine/2012/november/article/30-new-operating-system-public-health

Exhibit 1

Typology of non-medical and medical care integration

		Service integration	
		High	**Low**
Organizational integration	High	*Fully integrated:* Meaningful organizational and service across non-medical and medical care	*Segmented*: Significant organizational integration, with distinct services
	Low	*Referral*: Services integrated with independent organizations	*Non-coordinated*: Neither services nor organizations significantly integrated

Source/Notes: Analysis of data collected from ACOs.

Exhibit 2

ACO actions, methods, and approaches used to address non-medical patient needs

ACO actions used for non-medical needs	Methods used to meet non-medical needs	Specific approaches used to meet non-medical needs
Identified patients with non-medical needs	Processes in primary care visits used to identify needs	Provider identified needs
		Health assessment identified needs
		Patient self-identified needs
	Care transformation programs	Programs to reduce utilization (e.g., ED navigators identified patient who needed housing support)
		Patients identified via chronic condition management programs (e.g., a diabetic who needs a refrigerator)
Allocated resources to meet non-medical needs	Internal resources	Designated staff allocated to meeting needs
	External resources	Community partners
		Purchased services
		Public health agencies
Approaches aimed at meeting non-medical needs	Individualized solutions developed on a patient-by-patient basis	Formalized via well-defined processes or care pathways
		Ad-hoc as needs were observed
	Targeted approaches with well-defined solutions or programs to meet a specific need	For example, ACO programs that provided transportation to patients

Source/Notes: Analysis of data collected from ACOs.