

Reducing Acute Hospitalizations at High-Performing CPC+ Primary Care Practice Sites: Strategies, Activities, and Facilitators

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ABSTRACT

PURPOSE Despite evidence suggesting that high-quality primary care can prevent unnecessary hospitalizations, many primary care practices face challenges in achieving this goal, and there is little guidance identifying effective strategies for reducing hospitalization rates. We aimed to understand how practices in the Comprehensive Primary Care Plus (CPC+) program substantially reduced their acute hospitalization rate (AHR) over 2 years.

METHODS We used Bayesian analyses to identify the CPC+ practice sites having the highest probability of achieving a substantial reduction in the adjusted Medicare AHR between 2016 and 2018 (referred to here as AHR high performers). We then conducted telephone interviews with 64 respondents at 14 AHR high-performer sites and undertook within- and cross-case comparative analysis.

RESULTS The 14 AHR high performers experienced a 6% average decrease (range, 4% to 11%) in their Medicare AHR over the 2-year period. They credited various care delivery activities aligned with 3 strategies for reducing AHR: (1) improving and promoting prompt access to primary care, (2) identifying patients at high risk for hospitalization and addressing their needs with enhanced care management, and (3) expanding the breadth and depth of services offered at the practice site. They also identified facilitators of these strategies: enhanced payments through CPC+, prior primary care practice transformation experience, use of data to identify high-value activities for patient subgroups, teamwork, and organizational support for innovation.

CONCLUSIONS The AHR high performers observed that strengthening the local primary care infrastructure through practice-driven, targeted changes in access, care management, and comprehensiveness of care can meaningfully reduce acute hospitalizations. Other primary care practices taking on the challenging work of reducing hospitalizations can learn from CPC+ practices and may consider similar strategies, selecting activities that fit their context, personnel, patient population, and available resources.

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INTRODUCTION

Substantial evidence demonstrates that many acute hospitalizations in the United States could be avoided by providing patients with timely access to high-quality primary care.¹⁻⁶ Yet many primary care practices and primary care practitioners (PCPs) face challenges achieving this goal. Beset by increasing patient complexity and administrative burdens, PCPs also face fee-for-service payments insufficient to support their efforts to deliver high-quality care that is accessible, continuous, coordinated, and comprehensive.⁷⁻¹⁰

To help address such challenges, in January 2017, the Centers for Medicare & Medicaid Services launched Comprehensive Primary Care Plus (CPC+).¹¹ This program gave primary care practice sites financial resources and technical assistance, and promoted regionally based payment reform and primary care transformation to improve quality of care and achieve better health outcomes at lower cost.^{12,13} More than 3,000 sites participated in CPC+.

Because hospital spending accounts for 41% of annual Medicare Part A and B costs,¹⁴ even a modest reduction in the acute hospitalization rate (AHR) could yield savings. There is little evidence, however, identifying effective strategies for reducing avoidable hospitalizations across diverse primary care practice settings and



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patient populations. As part of the CPC+ independent evaluation, we therefore examined how practices that succeeded in reducing AHR did so.

METHODS

We used Bayesian analyses to identify the CPC+ practice sites—single physical locations where patients are served—with the highest probability of achieving substantial reductions in adjusted Medicare AHR over time. We then conducted telephone interviews and a within- and cross-case comparative analysis of 14 of these primary care practice sites (hereafter referred to as AHR high performers).

AHR High Performer Identification

We defined AHR as the number of hospitalizations at short-stay acute hospitals and critical access hospitals per 1,000 Medicare beneficiaries per year. This AHR measure included emergency department (ED) visits and observation stays if they resulted in an inpatient admission; we excluded hospitalizations for elective surgery and planned procedures.

We used Medicare claims and enrollment data and Bayesian modeling to estimate the probability that each CPC+ practice site would achieve a true reduction in its adjusted AHR that was substantial (at least 5% larger than the average of all CPC+ practice sites). To guard against compositional changes in a practice's case mix creating the appearance of improvement that did not reflect actual practice transformation, the model adjusted for a range of patient, practice, and market characteristics; to guard against random chance creating the appearance of improvement, especially in small practices, the model shrinks the AHR estimates for all practices toward the mean, with greater shrinkage for small practices ([Supplemental Appendix 1](#)).

A total of 2,888 primary care practice sites joined CPC+ in 2017. Using the above methodology, we identified the 25 sites having the highest probability of achieving a substantial reduction in their adjusted AHR between 2016 (the year preceding CPC+) and 2018 (the second year of CPC+ participation).

Interviews

From February to December of 2020—the fourth year of CPC+ implementation and the first year of the COVID-19 pandemic—we conducted telephone interviews at 14 of the 25 identified AHR high-performer practice sites (the other 11 sites declined to participate). We conducted an initial 60-minute interview with 2 or 3 practice or system leaders at each of the 14 sites. We used a grounded theory approach, asking the same open-ended questions in each interview to identify the factors (care delivery activities, practice characteristics, and community context) that respondents perceived as influencing AHR reductions.¹⁵ We then conducted 60-minute follow-up interviews with 1 to 6 staff individually at 9 of the 14 sites to gather detail (the other 5 sites declined to participate). We

customized follow-up interviews based on findings from the initial interviews and the respondent's role at the practice. Across the 14 sites, we interviewed 64 respondents: 19 physicians, 14 practice administrators, 10 system-level leaders, 10 care managers, and 11 other practice staff (eg, nurses, pharmacists) ([Supplemental Appendix 2](#)).

Health services researchers (D.M.P., L.F., R.M.M., V.P., A.S., R.S., and S.H.) conducted all interviews for assigned AHR high performers, each paired with a physician with primary care research experience (A.S.O., D.R.R., R.E.P., and E.C.R.). We acquired verbal consent, and recorded and transcribed the interviews.

Qualitative Analysis

Within- and cross-case analysis proceeded in stages.^{16,17} After completing interviews, we drafted a case report for each AHR high performer based on interview notes. We then coded interview transcripts using NVivo version 12 (QSR International) using codes aligned with interview questions and open coding to capture factors influencing AHR. We met weekly to resolve coding discrepancies and revise codes. We used coded data to finalize case reports. We then scored the influence of factors present in each report from 0 (not contributing to AHR reduction) to 3 (major contributor to AHR reduction). Scoring took into consideration respondents' perceptions, when the factor was introduced or modified, and the proportion of patients potentially influenced by the factor. The assigned researcher (D.M.P., L.F., or V.P.) and all physicians reviewed each case report and independently scored factors. We held a series of meetings to reach consensus on final scores.¹⁸ We entered scores and substantiating data into a matrix with AHR high performers as columns and factors as rows.

Three authors (D.M.P., L.F., and V.P.) used the matrix to detect similarities and differences across the cases, merge and distinguish concepts, identify factors present for 4 or more cases, and generate findings.¹⁹ They met weekly to reach consensus on factors and referred back to transcripts and coded data as needed. To check that variation in the number of interviews conducted across AHR high performers did not bias results, we compared results from the 11 cases having multiple interviews with the results from the 5 cases having a single interview. Factors present at the 5 practices were represented in the sample of 11, although fewer factors emerged overall for the cases with less data.

After the analysis was complete, we conducted 3 virtual panels with 17 staff from 12 AHR high performers to confirm that our findings aligned with their perceptions and to discuss implications.

The New England Institutional Review Board granted the study an exemption from review.

RESULTS

The 14 AHR high performers experienced a 6% average decrease in the Medicare AHR between 2016 and 2018, in

Table 1. Selected Characteristics of AHR High Performers at Baseline, 2016

AHR High Performer	Change in AHR, % ^a	Probability of Improving AHR, % ^a	Hospital/System Owned	No. of PCPs	No. of Beneficiaries ^b	Prior Transformation Experience ^c	County Location	State
1	-11	99	Yes	3-5	798	Yes	Urban	Kentucky
2	-9	99	Yes	≥6	2,674	Yes	Urban	Missouri
3	-6	91	Yes	≥6	2,991	Yes	Urban	Colorado
4	-6	91	Yes	≥6	2,206	Yes	Urban	Pennsylvania
5	-5	87	Yes	≥6	2,540	Yes	Rural	Montana
6	-6	86	Yes	≥6	889	Yes	Urban	Colorado
7	-6	83	No	3-5	831	Yes	Urban	New Jersey
8	-5	83	No	3-5	1,028	Yes	Suburban	Michigan
9	-5	83	No	3-5	929	Yes	Rural	Arkansas
10	-5	82	Yes	≥6	1,802	Yes	Urban	Oregon
11	-5	77	No	≥6	574	Yes	Urban	Ohio
12	-4	77	No	≥6	1,090	Yes	Urban	Rhode Island
13	-4	76	No	≥6	1,256	Yes	Urban	Ohio
14	-4	75	Yes	≥6	1,055	Yes	Rural	Colorado

AHR = acute hospitalization rate; PCP = primary care practitioner.

Sources: Mathematica's analysis of data on the number, characteristics, and service use and spending of attributed Medicare beneficiaries based on Medicare Enrollment Database and claims data. Mathematica's analysis of data on practice size and ownership from IQVIA's SKGA Office-based Provider Database data; data on the number of attributed Medicare beneficiaries from Medicare Enrollment Database and claims data; data on participation in the Centers for Medicare & Medicaid Services' (CMS') Multipayer Advanced Primary Care Practice (MAPCP) and Comprehensive Primary Care Classic (CPC Classic); county data from the Area Resource File.

^a Risk-adjusted and denoised percentage changes from 2016 to 2018 ([Supplemental Appendix 1](#)).

^b Attributed Medicare fee-for-service beneficiaries in 2016.

^c Includes patient-centered medical home (PCMH) recognition, MAPCP, or CPC Classic. A practice was considered to have PCMH recognition if ≥1 of its PCPs had recognition at some point in 2014-2017 by the Accreditation Association for Ambulatory Health Care, The Joint Commission, the National Committee for Quality Assurance, or the Utilization Review Accreditation Commission. A practice was considered to be an MAPCP participant if it participated in any year during 2011-2014, as determined by a file from CMS. Participants include practices that stayed enrolled in CPC Classic for at least the first 5 months.

contrast to an average increase of 5% in the CPC+ practices that did not meet the criteria for probability of high performance. Table 1 displays selected characteristics for each participating AHR high performer.

Consistent with our purposive selecting of practices with highest probability of reduction in AHR, these practices differed from the full set of CPC+ practices (Table 2). The 14 participating AHR high performers were larger, employed more practitioners, and served more fee-for-service beneficiaries than did CPC+ practices overall and thus received larger CPC+ payments. All 14 had primary care transformation experience. AHR high performers also served patients with slightly higher medical complexity. They were more likely to be located in rural areas and in the western United States. AHR high performers' counties had more acute care hospital beds than those of CPC+ practices overall.

Activities Perceived as Reducing AHR

Our analysis of factors revealed 8 care delivery activities that AHR high performers perceived as reducing their AHR between 2016 and 2018. The activities aligned with 3 overarching strategies: improve access to primary care, expand care management, and increase comprehensiveness of care. Respondents perceived each strategy to increase their practice's capacity to meet patients' needs in a timely fashion, providing an alternative to ED or hospital care. Each AHR

high performer used a combination of activities within and across strategies, and attributed varying levels of influence to each activity on their AHR. Table 3 shows the prevalence of activities within strategies across AHR high performers. We discuss findings for the 3 strategies below and provide illustrative quotes in Table 4.

AHR Reduction Strategies and Associated Activities Improve Access to Primary Care

AHR high performers reported that improving access to primary care, combined with promoting patients' knowledge of the importance of access and how to access primary care, increased their likelihood of addressing patients' concerns quickly.

Many AHR high performers said they increased the number of same-day visits, encouraging patients to see a PCP for urgent needs or concerns (thereby avoiding ED visits). AHR high performers that hired staff to provide same-day visits (either nurse practitioners who explicitly focused on same-day visits or PCPs who did not yet have full patient panels) were able to expand access to more patients than those that added same-day slots to existing practitioners' schedules. A few AHR high performers added staff to increase access by lengthening their hours of operation during the week and on weekends, and one shared that weekend hours were "more impactful [on AHR] than longer days."

Table 2. Comparison of AHR High Performers With All CPC+ Practices at Baseline, 2016

Characteristic	All CPC+ Practices (N = 2,888)	AHR High Performers (n = 14)	Characteristic	All CPC+ Practices (N = 2,888)	AHR High Performers (n = 14)
Practice site characteristics^a			Beneficiary characteristics^d		
Practice size, % ^b			<i>(continued)</i>		
1-2 PCPs	34	0	Race/ethnicity, %		
3-5 PCPs	38	29	Black	7	8
≥6 PCPs	28	71	White	86	87
Attributed Medicare fee-for-service beneficiaries in 2018, mean No. ^b	710	1,683	Hispanic	1	1
Prior transformation experience, % ^c	61	100	None of above	6	4
Hospital/system owned (vs independent), %	55	57	Market characteristics		
Enhanced CPC+ (Medicare and payer partner) payments per NPI in 2018, median (SE), \$	42,964 (41,043)	47,559 (43,865)	Household income in practice county, median (SE), \$	54,208 (15,054)	53,164 (16,222)
Beneficiary characteristics^d			Location, %		
Age group, y, %			Rural	9	21
≤64	16	17	Suburban	15	7
65-74	47	46	Urban	76	71
75-84	26	26	Region, %		
≥85	12	11	Northeast	29	21
Female, %	59	58	Midwest	35	29
HCC score, mean (SE) ^e	1.08 (0.17)	1.14 (0.08)	South	18	14
Dually eligible for Medicare and Medicaid, %	15	16	West	18	36
Original reason for Medicare enrollment, %			Number of acute care hospital beds per 1,000 population in practice county, %		
Age	78	76	1st quartile	26	21
Disability	22	23	2nd quartile	26	14
End-stage renal disease	1	1	3rd quartile	26	59
			4th quartile	22	14

AHR = acute hospitalization rate; CPC+ = Comprehensive Primary Care Plus; HCC = hierarchical condition category; NPI = national provider identifier; PCP = primary care practitioner.

Sources: See Table 1 footnotes.

Note: Percentages do not always add to 100 because of rounding.

^a AHR high performers did not differ from CPC+ practices overall regarding Medicare Shared Savings Program status or CPC+ model track.

^b A change in AHR in smaller practices could be due to chance from small sample sizes, rather than real change. Very small practices therefore tended not to be identified as AHR high performers because the Bayesian model could not achieve a high level of confidence of a real change based on a small number of attributed Medicare fee-for-service beneficiaries.

^c See Table 1 footnotes for definition.

^d Based on Medicare fee-for-service beneficiaries attributed to practices in 2016.

^e Based on diagnoses in 2015. Score is normalized to a value of 1. Patients more healthy than average will have a score less than 1; those less healthy than average will have a score greater than 1.

A few AHR high performers increased timely telephone access to the practice by providing high-risk patients with the telephone number of a care manager. They noted that care managers' familiarity with the patient helped to rapidly address patient needs or connect the patient with the PCP.

Some health system–affiliated AHR high performers perceived their AHR improvements were achieved through system-owned urgent care centers providing patients an alternative to the ED when PCPs were not readily available. They noted that these system-affiliated centers had access to patients' information and could contact PCPs to schedule

primary care follow-up appointments through shared health information technology, unlike independently operated urgent care centers.

AHR high performers proactively promoted the use of primary care (through verbal and written communication, posters, and portal messages) as an alternative to the ED for managing new or worsening concerns.

Expand Care Management

Most AHR high performers credited the expansion of their care management with helping to reduce AHR. By

Table 3. Prevalence and Perceived Level of Contribution of Activities (Within Strategies) to Reduce Acute Hospitalizations Within and Across AHR High Performers

Activities (Within Strategies)	Perceived Level of Contribution, ^a by AHR High Performer													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Improve access to primary care														
Same-day visits														
Direct access by telephone														
Urgent care sites (system run)														
Expand care management														
Follow-up after hospitalization/ED visit														
Long-term care management														
Specialized programs														
Increase comprehensiveness of care														
Broader services at practice														
Broader and deeper care provided by PCP														

AHR = acute hospitalization rate; ED = emergency department; PCP = primary care practitioner.

^a = 0, not identified by respondents as a noteworthy factor for reducing their AHR; = 1, perceived as a minor contributing factor to reduced AHR; = 2, perceived as a moderate contributing factor to reduced AHR; = 3, perceived as a major contributing factor to reduced AHR.

Table 4. Hypothesized Pathways and Illustrative Quotes for Activities (Within Strategies) to Reduce Acute Hospitalizations at AHR High Performers

Activities (Within Strategies) and Hypothesized Pathways	Illustrative Quotes
Improve access to primary care	
Same-day visits: Increasing same-day appointment slots allows more patients to see a clinician at the practice quickly for urgent needs or concerns, and can help avoid primary care–treatable ED visits. Same-day visits also decrease the chance that an ED visit might result in admission, and help address clinical issues before they become more severe.	<p>“More frequent and appropriate use of the acute [primary] care system prevents hospitalizations, and that’s what we are doing with same-day availability. Get ‘em in and get them assessed before they seek ED care or put off care that could result in an acute admission.” – Care manager</p> <p>“Just having that access and the spots on our providers’ schedules for acute visits helps. Before patients said it was easier to go to the emergency room. Now, they’re able to get in right away to see somebody.” – Care manager</p>
Direct access by telephone: Sharing direct telephone numbers to care managers and encouraging patients to call (and having patients know that someone who knows them will answer or respond quickly) can increase patients’ likelihood of calling the practice when they have a question or concern rather than turning to the ED. It also promotes earlier intervention to prevent exacerbations that might lead to an ED visit or hospital stay.	<p>“We had started an after-hours on-call number we gave to the patients, put on our cards also, that gave them access to a nurse care manager after hours and on the weekends. And I believe with us being able to triage those patients and take care of their needs, that has reduced them going to the ER and the hospital for hospital stays.” – Registered nurse</p> <p>“We have strict standards in terms of coverage telephone after hours. We try to make sure that they [patients] are told to come to the office the next day instead of the emergency room, if appropriate.” – Registered nurse</p>
Urgent care sites (system run): Establishing urgent care access with EHR linkages to the primary care practices provides as alternative to the ED for patients to receive treatment for an acute episode when the practice is closed and may prevent ED visits and lower the chance of hospital admission.	<p>“... in our community, we didn’t have an urgent care center before, so patients used our emergency room at our local hospital instead. By adding the urgent care here, we can keep people out of the hospital whether it’s in the emergency department or being admitted.” – PCP</p> <p>“[These same-day care centers are] very different from other urgent cares in the community. These are our own people and it’s really very much a primary care–driven approach... when you had a patient that went to these centers, it was really more like they saw one of your partners in the office. The centers are open until 8 at night and for 4 hours on Saturday and Sunday. I think that was a pretty major driver [of reduced AHR].” – System lead</p>

continues

A_{1c} = glycated hemoglobin; AHR = acute hospitalization rate; COPD = chronic obstructive pulmonary disease; CPC+ = Comprehensive Primary Care Plus; DME = durable medical equipment; ED = emergency department; EHR = electronic health record; IT = information technology; PCP = primary care practitioner.

Table 4. Hypothesized Pathways and Illustrative Quotes for Activities (Within Strategies) to Reduce Acute Hospitalizations at AHR High Performers (continued)

Activities (Within Strategies) and Hypothesized Pathways	Illustrative Quotes
<p>Expand care management</p> <p>Follow-up after hospitalization/ED visit: Connecting with patients immediately after discharge from the hospital or ED provides patients with information, support, and linkages to care that can prevent future hospitalizations. For example, practices could identify and address issues with medications, transportation, and DME services needed after discharge and schedule timely follow-up with primary care. Transitions of care are also an opportunity to funnel patients to longitudinal care management services.</p>	<p>"There are so many different things that bring a person back to the hospital... couldn't afford the copay, didn't have a ride to the pharmacy, and so on. We wanted to keep [our follow-up calls] very open-ended, and a robot can't do that. I'm all for IT, but you really need a human who is listening to what you're going through and so that was the core of our transitional care; we really wanted that personal touch." – Program manager</p> <p>"An integrated Transition of Care Management program was the biggest lever on the AHR, not just a person. The care manager was vital, but she would not have been successful without the other things that she fit into and benefited from. So not just a person, it's a process and a program." – System lead</p>
<p>Long-term care management: Identifying and engaging patients with complex or comorbid conditions in relationship-based longitudinal care management can prevent or lessen the severity of exacerbations that might otherwise require hospitalization.</p>	<p>"[It's been] important to have a team that tackled high-risk patients and hospitalizations together as a team. Divvied up the work, made sure they took care of all the details." – PCP</p>
<p>Specialized programs: Offering clinical programs designed for subgroups of patients at high risk for hospitalization can allow practices to identify emerging issues early and focus services where they may have the largest impact on hospitalization.</p>	<p>"We saw our COPD admission rate and readmission rate drop dramatically from [the specialized albuterol program]. We identified patients that may be experiencing COPD exacerbations by tracking their albuterol refill rate. Their refill rate triggered us to reach to those patients." – PCP</p> <p>"Like our A_{1c} [values]—we watch our diabetic patients. We watch our diabetic patients a lot closer than we used to. I think it helps us catch things early. It helps them realize, 'Oh my gosh, my A_{1c} is super high,' and it brings it to their attention to improve on those so that they don't end up in the hospital." – Care manager</p>
<p>Increase comprehensiveness of care</p> <p>Broader services at practice: Viewing the needs of the whole person rather than just isolated problems might lead to fewer hospitalizations. Expanding the ability to provide services such as behavioral health, pharmacy, and social service support can prevent exacerbations of chronic conditions that might lead to hospitalization and reduce the likelihood of presentation for new conditions requiring hospitalization.</p>	<p>"I think that it [CPC+] just brought to the forefront that, you know, trying to take care of the whole patient with the education, working with the team on getting the full picture of what this patient needs, and keeping the patient involved in what they need to do to stay out of the hospital. I think that just seeing all of that together and not just piecing things together and just taking care of 1 problem when they come in, but doing the whole person." – Care manager</p> <p>"We've got this team of physicians, of pharmacists, of care coordination, and also of integrated behavioral health. All these could potentially work together to make certain a person needs to go to the hospital, vs being treated at the practice, and we can make those decisions as a team." – PCP</p>
<p>Broader and deeper care provided by PCP: Transitioning tasks to others frees up PCPs so they can spend more time on care of patients with complex needs—and thus better understand patients' circumstances and conditions, ensure appropriate diagnosis and treatment plans, and build trust.</p>	<p>"I felt freed up to do those things that I really wanted to do, as a doctor, to actually talk to my patients and have them take care of their health. Shifting the non-provider work to nonproviders allowed us that extra time to do these provider things we really wanted to do, that made us feel good about our work." – PCP</p> <p>"We have longitudinal relationships with patients, which gives us more time with patients to learn about social determinants that affect their health, to communicate to patients how to better care for themselves, and the ability to notice changes to the patients' health over time and intervene early." – PCP</p>

A_{1c} = glycated hemoglobin; AHR = acute hospitalization rate; COPD = chronic obstructive pulmonary disease; CPC+ = Comprehensive Primary Care Plus; DME = durable medical equipment; ED = emergency department; EHR = electronic health record; IT = information technology; PCP = primary care practitioner.

identifying patients at high risk for ED or hospital use and addressing patient needs with focused outreach to supplement traditional PCP visits, AHR high performers perceived they were able to avert hospitalizations by intervening earlier in the course of illness.

Most AHR high performers followed up with patients within 48 hours of a hospital discharge to provide information and linkages to primary care and thereby prevent additional hospitalizations. They called patients to check on their health; review medications; answer questions; provide

disease-specific education; connect them to needed supports (eg, medical equipment, social services); and schedule follow-up appointments with the PCP. AHR high performers instituted or expanded these efforts during the first 2 years of CPC+ by hiring or redeploying staff to this role. Many AHR high performers extended these efforts to patients who visited the ED or experienced observation stays. Various AHR high performers perceived that follow-up calls were most effective when made by care managers who had specific skills (eg, nursing or social work background, ability to build rapport, empathy) and who used purposeful processes (eg, reviewing discharge reports to prepare for calls, asking questions, and following through to ensure patients' needs were met)—in contrast to automated calls or calls by less-skilled staff focused on scheduling follow-up appointments. Follow-up calls were especially effective when care managers making the calls were connected to a care team. Receipt of complete and timely information from discharging facilities, and, in a few cases, the discharging hospital scheduling the patients' follow-up appointments with their PCP, enabled their work.

Many AHR high performers credited long-term care management as contributing to improvements in AHR. Although strategies varied across AHR high performers, long-term care management consistently involved continuous relationship-based support outside of PCP visits that was matched to patients' needs, conditions, and abilities. AHR high performers added staff to provide these services to additional patients at the practice site. They noted that care managers were most effective when they knew how to prioritize patients, were skilled problem solvers, and could build trust with patients and PCPs. To enroll the patients at highest risk for hospitalization, several AHR high performers used enhanced risk score algorithms and/or developed capabilities to detect frequent users of the hospital and ED.

Several AHR high performers developed specialized care management programs at their site, targeting subgroups of patients based on condition prevalence in their population, as well as available practice resources, and likely intervention effectiveness. For example, one monitored the frequency of albuterol refills among patients with chronic obstructive pulmonary disease as an early indicator of higher risk of disease exacerbation. Another AHR high performer developed an outpatient program to better manage care of people with sickle cell disease, which reduced admissions for its complications.

Increase Comprehensiveness of Care

Many AHR high performers perceived that increasing the comprehensiveness of care helped reduce AHR by better managing new conditions and preventing exacerbations of patients' chronic conditions. These AHR high performers expanded the breadth of services offered at the practice site to treat patients' range of needs. Examples of new or enhanced services included behavioral health, social work, and enhanced medication management. As one PCP

described the influence of broadening the practice's capabilities on AHR, "It's all together. It's everybody, truly all-hands-on-deck wrapping ourselves around; we all bring something to the table that's different. It's synergistic."

Several AHR high performers described using team-based care to allow PCPs to spend more time with complex patients to better understand their needs and assess their health concerns, increasing the breadth and depth of care provided. To accomplish this, one AHR high performer used advanced practice clinicians to manage patients with straightforward issues so that physicians could reserve time for those with more complex health conditions. Other AHR high performers shifted staff roles to help PCPs be more comprehensive; for example, medical assistants took on advanced activities such as reviewing medications, identifying gaps in care, and working as scribes.

Facilitators of AHR Reduction Strategies

Our analysis also identified practice characteristics that facilitated AHR high performers' ability to implement the 3 AHR reduction strategies. Table 5 describes 4 facilitators that were present across all or most AHR high performers: experience with transformation efforts, use of data, a team-based approach, and interest in innovation.

DISCUSSION

The AHR high performers achieving a substantial 2-year reduction in Medicare AHR described a variety of activities they perceived as preventing unnecessary hospitalizations. The activities they perceived as most helpful align with 3 strategies: (1) promoting timely access to primary care, (2) identifying patients at high risk for hospitalization and addressing their needs with enhanced care management, and (3) expanding the breadth and depth of services offered at the primary care practice site. These activities also align with 3 of the defining elements of advanced primary care—accessibility, care coordination (including coordinating transitions of care and managing chronic conditions), and comprehensiveness^{2,10,20}—that all have been shown to be associated with reduced hospitalizations.^{1,4,21-32}

Although many AHR high performers perceived that similar activities reduced AHR, no 2 used the same combination of activities. All AHR high performers leveraged available human and financial resources, chose strategies based on local circumstances and priorities, and dedicated additional staff resources to the selected activities. They used staff with relevant training and commitment, supported staff with a robust care team, and used data to identify the highest-value activities (including identification of patient subgroups). Our analysis also points to the importance of taking advantage of opportunities to innovate and building on prior experience. Our findings may help practices choose a starting point for reducing AHR that matches their patient population, practice capabilities, and resources, and may encourage these practices

Table 5. Facilitators of AHR High Performers' Efforts to Prevent Acute Hospitalizations

Facilitator	Mechanism ^a	Illustrative Quote
Experience with and investment in practice transformation	Provided practices necessary payment structure, incentives, resources, and capabilities to track AHR Offered learning supports that helped practices use data and adopt new workflows	"CPC+ was the first time we were responsible for total cost of care... that we, as a practice, were financially connected to the hospitalization rate. We weren't measuring that at the practice level [before CPC+]. Once we had a financial connection and mechanism to track that, we completely changed our workflows." – PCP
Use of data from CPC+, other payers, health systems, and electronic health record enhancements	Enabled practices to monitor high-risk patients, intervene early in their care, and link them to helpful resources Improved PCPs' ability to make point-of-care decisions	"All of a sudden, we were given lists that say, 'These are your 10% of patients who are hospitalized the most or have the most ED follow-up, the most chronic disease.' By identifying these patients, we were able to link them to our new ancillary services [within the primary care practice site] and really tackle the reasons that they're not doing well." – PCP
Implementation or enhancement of primary care teams through team-based care models	Allowed staff to work at the top of their license and cover for each other to prevent gaps in care Strengthened patients' trust in care team members in addition to PCPs	"I think how cohesively the care team works together makes a big impact. At many of our [non-AHR high-performer] sites, often the care team doesn't make a move without getting the provider's permission first. The fact that [we'll] just dive into what the patient needs right then, and then loop in the provider later is unique." – PCP
Organizational support for and staff interest in innovation	Gave staff permission to try new approaches and take risks Helped staff implement and hone new workflows and processes Fostered a focus on using data to identify issues and implementing quality improvement projects Enabled system-owned AHR high performers to undertake investments that would be too expensive to make on their own	"We are very open [to our staff] identify[ing] potential problems. Small acts of change, or small plan-do-study cycle-type projects we do at an ongoing, never-ending basis. [This practice has] been very, very supportive of small tests of change consistently, [whether that is] workflow changes [or] IT changes. And because we're making microchanges consistently, they tend to stick because they're not huge changes to the workflow redesign." – Pharmacist

AHR = acute hospitalization rate; CPC+ = Comprehensive Primary Care Plus; ED = emergency department; IT = information technology; PCP = primary care practitioner.

^a Mechanism by which the facilitator supported care delivery activities within the 3 overarching strategies.

to try out new activities, learn from them, and continue to transform. AHR high performers' perceptions of activities most beneficial to AHR reduction are especially relevant for practices participating in Primary Care First, which rewards reduced hospital use while giving practices flexibility in the care delivery innovations used to achieve this outcome.³³

Our study has limitations. First, it was designed to gather rich insights and detailed examples, not to provide generalizable findings. Second, the data might be subject to recall bias because we asked respondents to consider activities that occurred between 2016 and 2018, that is, 2 to 4 years before our interviews. Also, the findings are based on respondents' perceptions of activities that reduced AHR. Finally, reducing health care expenditures (to which hospitalizations contribute the largest share) is a national policy priority, and a key desired outcome for CPC+; thus, we focused on AHR to identify AHR high performers for this study. Although it is important to reduce potentially preventable hospitalizations through better primary care, some people may have unmet need for hospitalizations. Reducing the rate of acute

hospitalizations is therefore at best only one aspect of successful performance by primary care practices. Ideally, future research could focus on other dimensions of high-quality primary care as important outcomes of interest. As noted in a recent report by the National Academies of Sciences, Engineering, and Medicine, "primary care is the only health care component where an increased supply is associated with better population health and more equitable outcomes. For this reason, primary care is a common good, making the strength and quality of the country's primary care services a public concern."¹⁰

Our findings suggest that the AHR can be meaningfully reduced by strengthening the local primary care infrastructure through practice-driven, targeted changes in access, care management, and comprehensiveness of care. Other primary care practices taking on the challenging work of reducing hospitalizations can learn from AHR high-performer practices in the CPC+ program and may consider similar strategies, selecting activities that fit their context, personnel, patient population, and available resources.

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Key words: hospitalization; emergency department; health care use; ambulatory care–sensitive conditions; chronic disease; primary care; Medicare; older adults; health services for the aged; vulnerable populations; access to health care; patient care management; comprehensive health care; change, organizational; quality improvement; practice-based research

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 **Supplemental materials**

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