Risk Stratification Methods and Provision of Care Management Services in Comprehensive Primary Care Initiative Practices

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ABSTRACT

PURPOSE Risk-stratified care management is essential to improving population health in primary care settings, but evidence is limited on the type of risk stratification method and its association with care management services.

METHODS We describe risk stratification patterns and association with care management services for primary care practices in the Comprehensive Primary Care (CPC) initiative. We undertook a qualitative approach to categorize risk stratification methods being used by CPC practices and tested whether these stratification methods were associated with delivery of care management services.

RESULTS CPC practices reported using 4 primary methods to stratify risk for their patient populations: a practice-developed algorithm (n = 215), the American Academy of Family Physicians' clinical algorithm (n = 155), payer claims and electronic health records (n = 62), and clinical intuition (n = 52). CPC practices using practice-developed algorithm identified the most number of high-risk patients per primary care physician (282 patients, *P* = .006). CPC practices using clinical intuition had the most high-risk patients in care management and a greater proportion of high-risk patients receiving care management per primary care physician (91 patients and 48%, *P* = .036 and *P* = .128, respectively).

CONCLUSIONS CPC practices used 4 primary methods to identify high-risk patients. Although practices that developed their own algorithm identified the greatest number of high-risk patients, practices that used clinical intuition connected the greatest proportion of patients to care management services.

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INTRODUCTION

The Comprehensive Primary Care (CPC) initiative is a multipayer initiative of the Center for Medicare & Medicaid Innovation (CMMI) designed to improve primary care payment to and care delivery by more than 2,000 practitioners who serve approximately 2.5 million patients.[1] Medicare and other CPC payer partners pay participating practices a population-based care management fee that supports enhanced services not traditionally paid for by fee for service, including care management. A key care delivery requirement in CPC is to provide risk-stratified care management. CPC requires practices to stratify their patient population into tiers of health care risk using an approach of their choice and then to provide care management to patients most likely to benefit.

Implementation of risk-stratified care management can help target limited practice resources to patients most in need of services and potentially reduce costs and improve patient outcomes.[2] This study describes the types of various risk stratification methods used in CPC practices and associates risk stratification methods with the provision of care management services. We conducted an analysis of risk stratification methods CPC practices adopted in the first year of the program (October 2012 to December 2013).

METHODS

In early 2014, CPC practices submitted documentation describing their approach to risk stratification of their patient population and responded to questions on implementation of care management services. We used a modified grounded theory approach and a constant comparative method to analyze CPC practices' responses.[3-4] Two members of the research team (A.R., A.B.) determined the methods to categorize risk stratification used by practices. If a practice used multiple methods to stratify risk, both researchers reviewed the documents and, through consensus, assigned a primary method.

Practices were given the opportunity to place patients in up to 6 different risk tiers, including tiers for low risk/no risk and not assigned to risk tier. The practice reported the number of patients in each tier. We used the highest 2 risk tiers to define high-risk patients to capture patients with rising risk who may benefit from care management services. Additionally, we acknowledge that some patients at highest risk may not engage in care management services, in part because of underlying medical or psychosocial conditions. CPC practices attested to the number of patients in each tier who received care management services.

For our main analysis, we used one-way analysis of variance to determine whether the number of high-risk patients, the number of high-risk patients receiving care management services, and the percentage of high-risk patients receiving care management services differed by primary risk stratification method. We calculated variables for each outcome using full-time equivalent physicians per practice.[5] We conducted an additional analysis controlling for available practice-level data using a generalized linear equation to test whether the risk stratification method was associated with differences in outcomes.

RESULTS

Of 492 practices participating as of December 2013 in CPC, 484 submitted complete data on risk stratification method, number of patients in the highest 2 risk tiers, and number of patients in the highest 2 risk tiers receiving care management services. The responding CPC practices are a diverse group, including solo primary care practices (16%) and large primary group practices (more than 7 physicians, 19%). Approximately 40% of practices had medical home recognition from their state or from the National Committee for Quality Assurance (NCQA),[6] and most practices were located in metropolitan areas (Table 1).

Practices used a variety of approaches to stratify their patient into tiers of risk. We categorized the

approach by first assessing whether a practice used a preexisting computer or claims-based algorithm to define high risk. Relatively few practices (13%, Table 2) used existing electronic health record (EHR) software tools or a risk score algorithm based on claims. Next, we categorized the remaining practices based on whether they (1) created their own score or algorithm to define high-risk patients (practice-developed algorithm), (2) used the American Academy of Family Physicians' (AAFP) risk stratification algorithm,[7] or (3) defined risk solely by clinical intuition. Most CPC practices (44%) created their own algorithm using a combination of patient's chronic conditions, age, and hospitalizations in the past year, then scored by stratifying patients into tiers based on these factors. Approximately 30% used the AAFP risk stratification algorithm, which assigns patients to 1 of 6 risk tiers based on primary health care needs (ranging from "primary prevention" to "catastrophic").[10,11] Few practices (11%) used clinician intuition as the primary method to identify high-risk patients.

Practices that developed their own algorithm identified more patients in the highest 2 risk tiers (mean per physician = 282 patients) than practices that

Table 1. Comprehensive Primary Care Initiative Practice Demographics

Characteristic	Value
Regional distribution	
Arkansas, % (No.)	14 (67)
Colorado, % (No.)	15 (71)
New Jersey, % (No.)	14 (70)
New York: Hudson Valley region, % (No.)	15 (73)
Ohio and Kentucky: Cincinnati-Dayton region, % (No.)	15 (74)
Oklahoma: Tulsa region, % (No.)	14 (66)
Oregon, % (No.)	13 (63)
Practice size	
Solo physician, % (No.)	16 (81)
2-3 physicians, % (No.)	35 (170)
3-6 physicians, % (No.)	29 (141)
>7 physicians, % (No.)	19 (92)
Medicare fee-for-service patients, median, No. (IQR)	501 (285-821)
Ownership type	
Hospital, academic, HMO, % (No.)	45 (216)
Physician, % (No.)	53 (259)
Government, other, % (No.)	2 (9)
PCMH recognition, % (No.)	42 (201)
Multispecialty, % (No.)	12 (59)
Meaningful Use Stage 1, % (No.)	77 (373)
Metropolitan, % (No.)	81 (393)

HMO = health maintenance organization; IQR = interquartile range; PCMH = primary care medical home.

Table 2. Comprehensive Primary Care Practice Risk Stratification Method

Risk Stratification Method	Practice-Developed Algorithm	AAFP Available Algorithm	Payer Claims/EHR	Clinical Intuition	P Value
Number of practices	215	155	62	52	
High-risk patients per primary care physician FTE, mean No. (SD)	282 (355)	181 (245)	171 (175)	218 (366)	.006
High-risk patients receiving care management per primary care physician FTE, mean No. (SD)	69 (148)	40 (61)	79 (119)	91 (200)	.036
Overall high-risk patients receiving care management per physician FTE, %	37	36	43	48	.128

AAFP = American Academy of Family Physicians; EHR = electronic health record; FTE = full-time equivalent.

used the AAFP algorithm (mean per physician = 181 patients), an algorithm derived from claims and EHR data (mean per physician = 171 patients), or clinical intuition (mean per physician = 218 patients) (Table 2). Practices using a practice-developed algorithm, however, had significantly fewer patients receiving care management (mean per physician = 69 patients) when compared with practices using clinical intuition (mean per physician = 91 patients). Moreover, the overall percentage of high-risk patients who received care management differed by risk stratification method: clinical intuition (48%), payer claims and EHRs (43%), practice-developed algorithm (37%), and AAFP clinical algorithm (36%). After adjusting for practice-level characteristics, the results were not meaningfully different (data not shown).

DISCUSSION

We found that CPC practices used 1 of 4 primary methods to identify high-risk patients for care management: a practice-developed algorithm, the AAFP algorithm, existing claims and EHR-based tools, and clinical intuition. At the end of the first year, practices that developed their own algorithm identified the greatest number of high-risk patients. Practices that primarily used clinical intuition, potentially cheaper and faster to implement, provided care management to the greatest proportion of high-risk patients.

Our study highlights 2 major steps in implementing risk-stratified care management: (1) identifying the high-risk patients, and (2) effectively connecting these patients with care management. Current widely used methods to characterize high-risk patients focus on claims-based algorithms that account primarily for health care utilization patterns.[8] These methods do not necessarily align with clinicians' definition of complexity, which includes behavioral, social, and economic needs.[9-13] Moreover, busy primary care practices may need longer than 1 year to create new workflows to review empaneled patients, categorize

patients into different risk tiers, and establish care management services.

Our study has several limitations. First, the data gathered are primarily self-reported by CPC practices. Practices, however, reported these data with the understanding that random audits of their reported data would occur. Second, ours is a descriptive study of cross-sectional data, which limits our ability to examine causality. Third, although our sample is large and geographically diverse, it is not nationally representative of primary care practices. Practices that participated in CPC were willing to devote resources to changing practice care delivery and met selection criteria.

Despite these limitations, our results offer important insights into primary care implementation of risk-stratified care management. The experience of CPC practices suggests that risk-stratified care management requires stable funding mechanisms from multiple payers.[14,15] CPC laid the foundation for practice requirements in Comprehensive Primary Care Plus (CPC+), a new CMMI initiative extending the work of CPC.[15,16] Clinicians in track 2 of CPC+ will use both intuition and an algorithm as part of a 2-step process of risk stratification, which has been found to be more effective at identifying high-risk patients.[17-19] As payers shift reimbursement from volume-based to a value-driven care, we expect more primary care practices to focus on finding the best ways to implement high-risk care management.

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